



This is to certify that the

thesis entitled

FOCUS ON FORM: THE ROLE OF NEGATIVE FEEDBACK
IN GERMAN RELATIVE PRONOUN SELECTION

presented by

DANIEL PARK

has been accepted towards fulfillment
of the requirements for

M.A. degree in German

Robert R. Paulsell
Major professor

Date 7-21-98



PLACE IN RETURN BOX
to remove this checkout from your record.
TO AVOID FINES return on or before date due.

DATE DUE	DATE DUE	DATE DUE
OCT 23 2007	MAR 22 2007	

**FOCUS ON FORM: THE ROLE OF NEGATIVE FEEDBACK IN GERMAN
RELATIVE PRONOUN SELECTION**

By

Daniel Park

A THESIS

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

MASTER OF ARTS

**Department of Linguistics and Germanic, Slavic, Asian and African
Languages**

1998

ABSTRACT

FOCUS ON FORM: THE ROLE OF NEGATIVE FEEDBACK IN GERMAN RELATIVE PRONOUN SELECTION

By

Daniel Park

This project contrasts several kinds of explicit negative feedback within a CALL context. After completing a pre-test to determine initial ability, subjects were divided into four groups, three of which received treatment on the computer. The software administered different kinds of negative feedback to different groups. It was hypothesized that the group which received the metalinguistic feedback would perform significantly better on the post-tests than the group which received right/wrong feedback, and that the group that was required to reflect on its incorrect responses would perform better still. Test results showed that, although all groups demonstrated a trend toward improvement, no group performed significantly better than the others.

I also hypothesized that the two groups who received metalinguistic feedback would demonstrate positive attitudes toward the software, in terms of both perceived benefit and enjoyment, as measured by surveys. These survey results did demonstrate general attitude improvement.

ACKNOWLEDGEMENTS

I wish to thank Lei Chen, Jyotirmoy Dey, and Connie Page for their help in reviewing the collected data and providing statistical advice.

I would also like to thank the members of my advisory committee, who remained accessible and helpful throughout the process of producing this study:

Patricia R. Paulsell (chair)
Thomas Lovik
Alison Mackey
Patrick McConeghy

TABLE OF CONTENTS

LIST OF TABLES.....	vii
LIST OF FIGURES.....	ix
INTRODUCTION.....	1
CHAPTER 1	
RESEARCH QUESTIONS, LIMITATIONS, AND TERMS.....	4
Generalized Question.....	4
Specific Questions.....	4
Limitations.....	5
Terms.....	5
CHAPTER 2	
HYPOTHESES AND THEORETICAL & EMPIRICAL SUPPORT.....	7
Hypotheses.....	7
Support.....	7
Part I: Input Enhancement.....	8
“Fine-Grained” Analysis: Alertness, Orientation, and Detection.....	11
The Merger of Meaning and Structure: Focus on Form.....	16
The Role of Negative Feedback.....	19
Reflection vs. Impulsiveness in L2 Learners.....	22
Part II: Enjoyment and Perceived Benefit of CALL.....	23
CHAPTER 3	
METHODS AND PROCEDURES.....	27
Institutional and Classroom Settings.....	27
Subjects and Researchers.....	27
Procedures for the Protection of Human Subjects.....	29
Method.....	29
Pre-test.....	29
Treatment.....	30
Post-tests.....	38

Dependent Variables.....	38
Experimental Design.....	39
Data Collection Procedures.....	39
Timing.....	39
CHAPTER 4	
RESULTS.....	41
Post-Treatment Test Results.....	41
Chi-square Analyses.....	42
ANOVA Analyses.....	44
Survey Results.....	47
Subjects' Reflection.....	51
Summary.....	52
CHAPTER 5	
DISCUSSION.....	54
Section I: Discussion of Pre-test/Post-test Results.....	55
Section II: Recommendations for Future Research.....	59
Section III: Discussion of Survey Data.....	62
Attitude Improvement.....	63
Perceived Benefit.....	64
Section IV: Discussion of Reflection Data.....	64
CONCLUSIONS.....	66
APPENDIX A: PRE-TEST.....	69
APPENDIX B: IMMEDIATE POST-TEST.....	71
APPENDIX C: DELAYED POST-TEST.....	73
APPENDIX D: PRE-TEST SURVEY FORM.....	75
APPENDIX E: POST-TEST SURVEY FORM.....	76
APPENDIX F: CONSENT FORM.....	77
APPENDIX G: CHI-SQUARE TEST RESULTS.....	78

APPENDIX H: METALINGUISTIC FEEDBACK FIRST TREATMENT SESSION.....	79
APPENDIX I: METALINGUISTIC FEEDBACK SECOND TREATMENT SESSION.....	87
LIST OF REFERENCES.....	95

LIST OF TABLES

Table 1 - Means (Standard Deviations) from Brandl's follow-up interviews.....	26
Table 2 - Class percentages in each group.....	28
Table 3 - Rates of attrition for each group.....	28
Table 4 - Instructors and groups.....	29
Table 5 - Declensional forms of relative pronouns.....	32
Table 6 - Algebraic design of the treatments.....	39
Table 7 - Mean pre-test scores of all groups.....	39
Table 8 - Developers vs. non-developers for chi-square test: production, pre-test to immediate post-test.....	44
Table 9 - Kinds of ANOVA procedures run.....	45
Table 10 - Score improvement in the recognition section, pre-test to immediate post-test.....	46
Table 11 - Score improvement in the production section, pre-test to immediate post-test.....	46
Table 12 - Score improvement in the recognition section, pre-test to delayed post-test.....	46
Table 13 - Score improvement in the production section, pre-test to delayed post-test.....	47
Table 14 - Post-treatment attitude improvement among groups.....	49

Table 15 - Subjects' self-assessed improvement in relative pronoun selection.....	50
Table 16 - Summary of the results in regard to the three hypotheses.....	53
Table 17 - Percentages of correctly answered items in the metalinguistic group.....	58
Table 18 - Percentages of correctly answered items in the right/wrong group.....	58
Table 19 - Percentages of correctly answered items in the reflection group.....	58
Table 20 - Research questions and responses.....	66
Table 21 - Chi-square figures, pre-test to immediate post-test.....	78

LIST OF FIGURES

Figure 1 - Long's breakdown of negative evidence.....	6
Figure 2 - The components of attention.....	14
Figure 3 - Treatment questions.....	34
Figure 4 - Post-treatment test questions.....	34
Figure 5 - Improvement in test scores between groups and between tests.....	47
Figure 6 - Post-treatment attitude and perceived benefit on an ordinal scale of 1 to 5.....	51
Figure 7 - Clause type percentage of the total correct responses on the immediate and delayed post-tests.....	59

INTRODUCTION

In recent years, much of the research in second language acquisition (SLA) has dealt with the process of making input more comprehensible to L2 learners. This process, known as “input enhancement” (Sharwood Smith, 1991), attempts to focus learners’ attention on form, which entails a concentration on grammatical structure, but within a meaning-based context. As a means of achieving this goal, SLA researchers (Fotos, 1993; Long, 1996; P. Robinson, 1995; Schmidt, 1993; Tomlin & Villa, 1994) maintain that “attention” is a key factor in the detection of a given structure, where it is then available for further processing. In other words, when learning an L2, the learner must be able to cognitively process linguistic information for L2 acquisition to take place. Long (1996) states that attention “is widely claimed to be both necessary and sufficient for extracting items from a stimulus array and storing them in long-term memory” (p. 426). The current study attempted to test these theories by comparing three groups: in two of the groups, the study will endeavor to stimulate subjects’ attention, by administering explicit negative feedback which constrains learners to focus on form.

Also, by measuring student attitudes toward the computer-assisted language learning (CALL) program which administered the

treatment, this study will attempt to determine the effectiveness of such a program in motivating the student to use CALL software. In addition, a CALL situation is well-suited to testing the effectiveness of explicit negative feedback, because it creates an environment in which feedback to students is consistent¹, immediate, and repeatable. Students feel less self-conscious because correction comes from a machine rather than by a human in a classroom situation (in front of their peers) (Pennington, 1996). In gathering more data about this relationship, we as researchers may better determine how L2 instructors can best select the tools to make input more salient to their students.

Since the tool of computer technology was first made available to language learners in the late 1960's, the field of CALL has undergone several developments as new approaches and methodologies were introduced (Warschauer, 1997). Warschauer outlines a brief history of CALL, the first phase of which was behavioristic (stimulus-response) CALL, popular in the 1960's and 70's. Most programs introduced in this phase were of the "drill-and-practice" kind (or "drill and kill," as it was known near the end of its popularity). At the dawn of the 1980's, communicative CALL was introduced (Warschauer, 1997), in which programs made an attempt to teach grammar implicitly, and concentrate on meaning rather than on form. With the introduction of communicative CALL, it seems that

¹ Due to the fact that students could have various motives for their incorrect responses, it is possible that the feedback in this study was not entirely consistent.

the detractors of the drill-type programs which used explicit negative feedback may have acted too hastily in dismissing them. As discussed in detail in chapter 2, tasks which focus on form can be a valid means of promoting acquisition.

CALL will never constitute a teaching methodology in and of itself (Garrett, 1991; Warschauer, 1997); trends in CALL generally mirror trends in SLA, or as Warschauer (1997) states, “The effectiveness of CALL cannot reside in the medium itself but only in how it is put to use” (p. 17). With new research into the fields of attention and noticing, CALL specialists are seeing a resurgence of the kind of software that had its heyday twenty-five years ago, but with a new twist. Rather than concentrating on grammatical forms (isolated linguistic structures), programs with a new focus on form (structure, but within a communicative context) have taken advantage of the knowledge gained by SLA researchers in recent years. This study utilized form-focused CALL activities in order to determine if a focus on form can truly make relative pronouns more salient to learners.

Chapter 1

RESEARCH QUESTIONS, LIMITATIONS, AND TERMS

The main focus of this study is to examine the influence of various kinds of feedback on the correct selection of German relative pronouns. In conducting empirical research in the psychometric tradition in order to contrast three kinds of explicit negative feedback in a CALL environment, this study is concerned with the following generalized question and specific questions:

Generalized Question:

- Does the type of negative feedback given influence subjects' improvement in the accurate selection of German relative pronouns?

Specific Questions:

1. To what extent does the reception of metalinguistic feedback influence subject performance?
2. How does allowing the subjects extra time to reflect upon their incorrect responses affect overall performance?
3. Is there a relationship between the kind of feedback received and the subjects' perceived benefit from the CALL exercise?
4. Is there a relationship between the kind of feedback received and the subjects' overall enjoyment of the CALL exercise?

Limitations

1. Subjects in the study were undergraduate students enrolled in beginning-level German classes at a large public university. The findings of this study can only be generalized to those institutions which matriculate students of similar academic backgrounds.
2. Due to the difficulties involved with scheduling groups in the lab, intact classes were used in this study. The use of intact groups was the only means of assuring that subjects would use the software specific to their group. Since relative clauses were taught to students during the same semester that this study was conducted, it is possible that individual instructors contributed to some variation, though all instructors work from identical syllabi, readings, and quizzes.

Terms

Card - A HyperCard term referring to an individual screen within the program.

Courseware - Software used for a pedagogical purpose.

Feedback - This study utilizes Long's (1997, p. 10) definition of negative feedback, yet concentrating solely on overt error correction: "Reactive implicit or explicit information derivable from events or an interlocutor's verbal or non-verbal behavior which indicates that a learner's speech or writing (...) was ungrammatical, opaque, or inappropriate" [emphasis added]. See Figure 1 (Long, 1997).

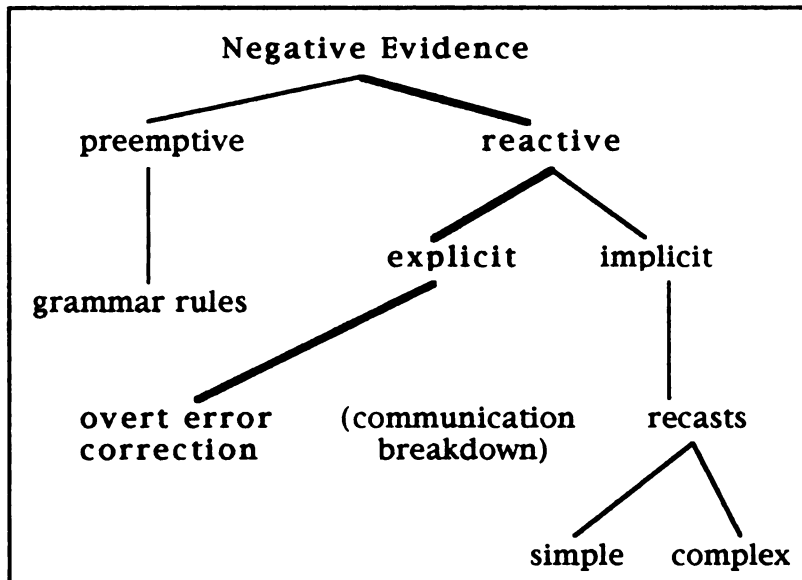


Figure 1. Long's breakdown of negative evidence [emphasis added].

Hypertext - a non-linear approach to information in which text is linked to other text in a non-linear way (Bradln, 1996).

Metalinguistic Feedback - feedback on an incorrect response which provides the learner with grammatical information as to why his/her response was wrong.

Stack - A term referring to a collection of cards which form a HyperCard document.

Task - This study uses Gass' (1997) definition of task: "...a piece of work that must be completed." Although the term is generally applied to meaning-focused activities, Gass also notes that a focus on form is "...an essential part of the learning process" (p. 153).

Chapter 2

HYPOTHESES AND THEORETICAL & EMPIRICAL SUPPORT

Hypotheses:

1. Students who utilize a computerized program focusing on relative pronouns, and featuring metalinguistic feedback, will score significantly higher on a post-test which tests them on these forms than students who only receive right/wrong feedback and are not instructed to reflect on their responses.
2. Students who only receive indications of correct/incorrect responses from the computer and who are required to reflect on their incorrect responses, so that they may determine for themselves why the responses are incorrect, and then receive metalinguistic feedback, will score higher than subjects who only receive metalinguistic feedback.
3. Subjects in the two groups who receive metalinguistic feedback will report both greater enjoyment and greater perceived benefit of their CALL experience on a standardized post-test survey than those students in the right/wrong group.

Support

In order to justify the previously mentioned hypotheses, I will cite recent theoretical work and empirical studies, which aided me in designing the overall project and pointed to the possible outcomes of

my own research. I have divided this literature into two parts. The first provides support for formulating hypotheses 1 and 2, since the two differ only in respect to the amount of reflection required of the participant. This part examines one aspect of the role of input enhancement, addresses the notions of noticing and attention, as well as the use of negative evidence as enhanced input to facilitate acquisition. In addition, a small section which examines research on learner impulsiveness supports only hypothesis 2. The second part of this review, which supports hypothesis 3, addresses the role of CALL in SLA research, particularly in regard to student attitudes toward using it. Although CALL is clearly not the main focus of this study, I wished to assess subjects' enjoyment and perceived benefit from the method of treatment; recent studies support my hypothesis that both would be generally positive.

Part I: Input Enhancement

A number of theories exist on the process of making input more salient for the L2 learner, one aspect of which is known as "input enhancement" (Sharwood Smith, 1991). This process has also been called "consciousness raising" (Sharwood Smith, 1991; Schmidt, 1993), but both researchers dismiss the term as vague and confusing, and Schmidt states that "the terms 'conscious' and 'unconscious' have accumulated so many conflicting meanings that they are unusable and need to be replaced with specified and testable constructs" (p.

208)².

Although Schmidt makes clear that intention (defined by Schmidt as the conscious desire to acquire a certain structure) is not always necessary in second language acquisition, he contends that attention is necessary. Attention, as defined by Schmidt, is the state of awareness most conducive to noticing, the process by which a linguistic structure is detected and then available for further processing. Attention is regarded by many (Fotos, 1993; P. Robinson, 1995; Schmidt, 1993) as the key element involved in encoding linguistic information into long-term memory. Elaborating on this, Schmidt (p. 209) states that, “the subjective experience of ‘noticing’ is the necessary and sufficient condition for the conversion of input to intake.”

However, Robinson points out the difficulty in the usage of the term “attention.” The concept, according to Robinson (1995), has three uses:

1. “It can be used to describe the processes involved in ‘selecting’ the information to be processed and stored in memory” (p. 287). In other words, attentional resources home in on specific information for the learner to detect.
2. “It can be used to describe our ‘capacity’ for processing information” (p. 287). Limited capacity systems represent the

²Despite this warning, the term “conscious” in its various forms (“consciousness,” “unconscious,” “subconscious,” etc.) appears in the body of Schmidt’s article no fewer than 40 times, which may point to its pervasiveness in past research.

belief that only a finite amount of information could be attended to at one time. This meant that students, with their limited selective attention, could not focus on form and meaning at the same time. Robinson (1995) and Tomlin & Villa (1994) note, however, that more recent theories put an emphasis on the subjects' control of attentional resources rather than on their total attentional capacity. In other words, although attention may have certain limits, "these limits can be distributed among several tasks" (Tomlin & Villa, 1994, p. 188).

3. "Finally, it can be used to describe the mental 'effort' involved in processing information" (p. 287). Tomlin & Villa (1994) state that controlled processes require attention, and this may inhibit the completion of other attention-demanding tasks. However, they acknowledge the possibility of processing two such tasks simultaneously, provided the tasks are somehow compatible.

Tomlin & Villa (1994) added a fourth component to these uses, which they call the "course-grained" uses of attention, namely that attention is a question of the control of information and action. This examines "the process by which information is regulated as to whether or not it receives attentional resources" (p. 189). They point out that these four uses may at times contradict one another, and that a more precise analysis, or "fine-grained analysis" of attention is necessary.

“Fine-Grained” Analysis: Alertness, Orientation, and Detection

Tomlin & Villa’s (1994) analysis of attention differs slightly from Schmidt’s (1993), because they disagree with Schmidt’s claim that awareness is a prerequisite of noticing. Schmidt’s formulation of the Noticing Hypothesis was partially based on his diary study of his own attempts to acquire Portuguese. Tomlin & Villa (1994) call his study (as well as all diary studies) into question, due to the temporal irregularity of such studies. They state that “diary studies encompass spans of time as large as several weeks, but the cognitive processing of L2 input takes place in relatively brief spans of time, seconds or even parts of seconds” (p. 185), and cite this as a major limitation in discovering how attention or noticing function during the normal time course for a L2 learner. They suggest that conscious awareness (noticing) may not be as critical for acquisition as other processes, namely *detection* and *orientation*, as these are processes of attention that can be separated from awareness.

According to Tomlin and Villa (1994), there are three separate but related components of attention: *alertness*, *orientation*, and *detection*. I will discuss these each in detail, as well as relate the role of awareness in relation to these components of attention.

Alertness is regarded as an overall readiness to receive incoming stimuli. Tomlin & Villa (1994) cite two important aspects of alertness. First, the degree of alertness stipulates the speed at

which information is selected for processing. A warning, perhaps an auditory signal that the stimulus is coming, can increase learner alertness. Second, as a disadvantage of high alertness, rapid selection of information can lead to breakdowns in accuracy. In SLA, too much eagerness on the part of the learner can bring about such an effect. In this study, I had the expectation that sitting at the computer in anticipation of the treatment would bring about the required alertness in the subjects. The reflection group helped to determine if over-alertness was a problem, which is discussed in detail in this chapter's section on learner impulsiveness.

While alertness indicates a general readiness to receive data, orientation is the process by which attentional resources can be directed at a specific *kind* of stimulus. Tomlin & Villa (1994) state that the main idea of orientation is the notion that “the specific aligning of attention (‘orienting’) on a stimulus has facilitative or inhibitory consequences for further processing depending on whether information occurs as expected or not expected” (p. 191). By orienting subjects with explicit metalinguistic feedback toward the specific target structure of relative pronouns, it was anticipated that this would aid detection, and that subjects’ ability to accurately select relative pronouns would significantly improve.

This orienting of attentional resources facilitates the third aspect of attention, detection. Detection is the process in which cognitive registration of sensory information occurs. Detected

information is the stimulus that has been selected for further processing, and thus absorbs a lot of attentional resources. In so doing, it causes significant interference with the processing of other input. In SLA, detected information is encoded into memory and available for further cognitive processing (testing and hypothesis formation). In this study, once detection had occurred, I anticipated that subjects would process this information to the point that they could appropriately produce relative pronouns.

It is important to note that detection is most similar to what Schmidt (1993) labels “noticing.” The principal difference between these two terms is illustrated by the views which researchers have on the role of awareness in SLA. Awareness is generally viewed (both in SLA and cognitive science) as “a particular state of mind in which an individual has undergone a specific subjective experience of some cognitive content or external stimulus” (Tomlin & Villa, 1994, p. 193). They cite three prerequisites that learners must meet if they are to be labeled as aware (p. 193):

1. They must show a “behavioral or cognitive change” that can be attributed to the experience.
2. They must explicitly state that they were aware of the experience.
3. They must be able to describe the subjective experience.

Schmidt (1993) claims that acquisition is impossible without awareness. According to Tomlin & Villa (1994), however, none of

the three components of attention require awareness. In addition, they state that detection requires neither alertness nor orientation, though these processes certainly facilitate detection. They assert that information can be cognitively detected, although the learner is not aware of this occurrence. Therefore, awareness requires attention, but not vice versa. Schmidt's (1993) view of noticing is regarded by Tomlin & Villa (1994) as detection within selective attention. They state that awareness "plays a potential support role for detection, helping to set up the circumstances for detection, but it does not directly lead to detection itself" (p. 199). Figure 2 is the model of attention set forth by Tomlin & Villa, in examining the relationships of the various components of attention.

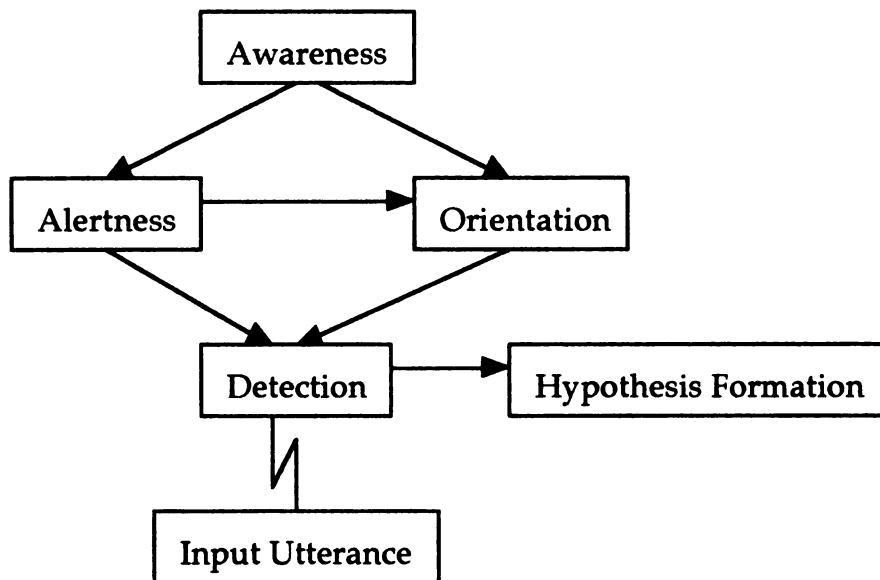


Figure 2. The components of attention (Tomlin & Villa, 1994, p. 197).

Figure 2 shows that awareness may augment alertness and

orientation. Alertness facilitates orientation, and both alertness and orientation facilitate detection, although these factors do not directly lead to detection. Once the input has been detected, it is available for testing and hypothesis formation.

An empirical study by Fotos (1993), in an effort to see how task type affects acquisition, illustrated how input enhancement can increase learner awareness, thus facilitating acquisition. Fotos assigned 160 Japanese university ESL learners (most of whom were male) to three groups: a grammar task group, which participated in three grammar input enhancement (dubbed “consciousness raising” by Fotos) tasks, a grammar lesson group, which received formal instruction on the same target structures (indirect object placement, adverb placement, and relative clause usage), and a control group, which performed communicative tasks with no grammatical content.

After each treatment, which was administered in three cycles of three weeks each (one week for each structure), all groups participated in noticing exercises. Subjects were read a story with the target structure embedded within; they then answered questions about the story. Participants then received the text to go over their answers, and were to underline any “special use of English.”

During analysis of data, Fotos determined the content-based noticings (proverbs, unusual phrases, etc.) to be fairly equivalent between groups. The grammar lesson group did notice more examples of indirect object placement than the other groups, but in

general, the grammar-based noticings of the two experimental groups were roughly equal. The grammar lesson and grammar task groups noticed significantly more target structures than did the control group, which achieved almost no grammar-based noticings. Generally, at least fifty percent of all subjects in the experimental groups made correct noticings, and many noticed multiple structures.

In addition, the experimental groups participated in a pre- and post-testing regime to determine gains in proficiency. Again, there were significant gains made within groups, yet no significant difference between the two groups when it came to general improvement. Fotos (1993) goes on to report the delayed effects of the experiment for both experimental groups, stating that, "...once their consciousness had been raised, the learners continued to be aware of the structures, noticing them significantly one and two weeks later in communicative input" (p. 397). Despite the limitation of intact classes in the study, the treatments raised the alertness of the participants and oriented them to the specific grammatical structures to be tested, thus aiding their detection.

The Merger of Meaning and Structure: Focus on Form

In Long's (1996) research on the environmental factors of L2 acquisition, he determined that comprehensible input alone is not sufficient for acquisition to occur. He advocated tasks that made grammatical forms more accessible to learners, by placing them in a communicative, meaning-based context. Long states that

“environmental contributions to acquisition are mediated by selective attention and the learner’s developing L2 processing capacity, and that these resources are brought together most usefully, though not exclusively, during *negotiation for meaning*” (p. 414).

This negotiation for meaning, during which a given target structure could be made more salient, was labeled by Long (1996) as *focus on form* (p. 429). Form-focused task activities often prove useful in giving students context-rich input. In addition to being more interesting than the rote memorization of grammar rules (which Long calls *focus on forms*), form-focused activities can also prove at least as effective as grammar-oriented learning in the acquisition of grammatical structure, as the following study illustrates.

In an SLA study which, like the present one, targeted the acquisition of relative clauses (specifically object of a preposition clauses), Doughty (1991) sought to compare the effects of form-focused versus grammar-focused instruction on relativization in English. She split 20 (10 male, 10 female) intermediate-level ESL students into three groups: a group which was given meaning-oriented treatment (or MOG), a group which received grammatical rule-oriented treatment (or ROG), and a control group (or COG).

After a pre-test to determine pre-treatment proficiency, all groups completed one computerized reading comprehension lesson

every day for 10 days. These texts contained five or six sentences, all of which contained an object of a preposition type relative clause [e.g. “I know the people you talked with” (Doughty, 1991, p. 436)]. During treatment, the subjects were assigned to read a given text, during which they were guided through four steps. First, they had to skim the text for overall content. This allowed subjects to attain a general familiarity with the material before proceeding further.

The second portion, called *Reading for Understanding*, was the only section that differed between groups. Sentences of the text appeared on the top half of the screen, with an “instructional window” on the bottom half. In their instructional window, the MOG group received semantic and lexical rephrasings, as well as overall clarification of sentence meaning. Also, the head nouns and relative pronouns appeared in capitalized form. The ROG group viewed a program called “Animated Grammar” in their instructional window, in which relative clauses were broken down into two sentences with the aid of animation. This was supplemented by explicit statement of grammatical rules. The COG group was provided only with the sentences of the original text, with no instructional aid whatsoever.

Following this section, all groups completed a scanning exercise, during which they were to answer questions about the text’s content. Finally, participants had to write a summary of the text in their L1. After their treatments, the subjects took a post-test to examine their proficiency gains. Although all groups improved significantly, the

MOG and ROG achieved massive gains over the COG, and were even able to generalize their knowledge to relative clause forms other than object of a preposition.

Although the limited number of subjects and no means of assessing long-term gains were hindrances in Doughty's study, her results support form-focused instruction. The MOG, which was treated with a focus on form, improved as much as the ROG. The MOG had the additional advantage of being the only group that demonstrated a firm understanding of text content, even though relative pronouns in English generally contribute little to the meaning of a given sentence.

This is not necessarily the case in German, however. Although German relative pronouns are also non-salient forms which carry little semantic meaning by themselves, they stipulate both gender and case within the clause. An error in pronoun selection could give the sentence a drastically different meaning. It is important to make these differences clear to the learner, thereby providing them with grammatical instruction within a meaningful context.

The Role of Negative Feedback

Upon examination of the theories of attention and noticing in L2 acquisition, one fundamental question arises: through which methods can input be enhanced and thus made more salient to the learner? Sharwood Smith (1991), among many others, has noted that this process may be problematic, as externally created salience

may fail to have the desired effect, for a number of reasons. First, the learner may not be developmentally ready to acquire the target form. Also, as attention is an internal process, other factors may have hold of the learners' attentional resources, preventing detection.

As opposed to positive evidence, negative evidence (the kind of feedback used for all groups in the present study) is defined as "information about what is not possible in the grammar" (Sharwood Smith, 1991). However, when learners receive information that clashes with their own internal grammars, a condition occurs that Sharwood Smith (1991) refers to as DAZED (detection of anomaly with zero development). In other words, a learner may know that a given utterance is incorrect, but unless she/he is given further feedback, she/he may remain unaware of the source of the error. Although the internalization of negative evidence may increase the learner's error detection capabilities, it does not necessarily lead to correct production (Sharwood Smith 1991). This clearly establishes a need for metalinguistic feedback, in order to clarify why a certain response is ungrammatical, and thus pointing learners in the direction of what *is* grammatical instead of what is not.

This is what Carroll and Swain (1993) discovered in an ESL study which, like the present one, investigated the effects of various kinds of feedback. They divided 100 adult native speakers of Spanish equally into five groups. When subjects made an error during treatment, group A received explicit rule statements

pertaining to the error. Participants in Group B were told when they were wrong, with no further elaboration (referred to as explicit utterance rejection). Group C subjects were given the correct form when they committed an error. Group D subjects, upon giving an incorrect response, were asked if they were sure. The control group received no feedback.

Although all treatment groups demonstrated significant improvement in comparison to the control group, Group A participants significantly outperformed all other groups on both an immediate and delayed post-test (with the exception of Group C on the immediate post-test). Although the study had the serious limitations of only one treatment session and no control for time on task, it lends credence to the notion that metalinguistic feedback has a positive effect on the acquisition of target structures.

In a similar study on input enhancement, Nagata and Swisher (1995) examined methods of making Japanese particles and passivization more salient to American university students. During this project, they investigated the effectiveness of computerized metalinguistic feedback vs. a more traditional method of feedback which only told the student if a word was unexpected or missing. Although the study had the limitation of using one class consisting of 38 subjects, their results revealed that the metalinguistic feedback was much more effective after testing all subjects on the treated grammatical structures. The metalinguistic software, which used a

complicated parsing system (akin to artificial intelligence) to identify errors and tailor the feedback to the individual subject, also supports the value of input enhancement in L2 instruction.

Reflection vs. Impulsiveness in L2 Learners

As mentioned in Tomlin & Villa's (1994) article on attention, when learners' alertness is heightened, the speed of their responses is much quicker. However, this has the unfortunate side effect of an increased number of errors. As a means of promoting more reflective behavior, Meredith (1978) conducted a quasi-experimental classroom study that tested impulsiveness in subjects, with the anticipation that students will catch their own errors when compelled to reflect before answering a question.

He then examined student scores on a language laboratory program (on cassette tape) when some students were forced to wait before responding to a question. Impulsive students' scores rose when they had to "stop and reflect" before entering their responses. Meredith (1978) states that "...allowing such subjects to respond as quickly as they wish serves only to encourage premature and inaccurate responding" (p. 326). The present study takes a slight variation on this theme. Rather than having students wait before answering a question, they must reflect on and write about their previously-entered incorrect responses, with the anticipation that impulsive students will catch some their own errors before seeing the metalinguistic feedback. This period of reflection is the only

differentiating aspect between the reflection and metalinguistic groups.

Part II: Enjoyment and Perceived Benefit of CALL

The third hypothesis posed in this study examines the role of awareness in the process of using the treatment software. That is, how does the subjective experience of working with the courseware contribute to the enjoyment and perceived benefit of the treatment? Also, how does the perceived improvement compare with actual proficiency gains? Early CALL research focused predominantly on whether such a treatment method was more or less effective than normal classroom instruction (Chapelle & Jamieson, 1989). For the purposes of this study, however, I chose to examine the subjective experience of the learner; several empirical studies support the notion that the utilization of CALL has a positive impact on the attitudes of participants.

In a recent quasi-experimental study, Gail Robinson (1990) argued that students demonstrated positive attitudes toward a CALL program which cognitively challenged them as opposed to other aspects of the program which merely gave explicit right/wrong feedback or automatically supplied the correct answer. Robinson stated that the level of student control and interactivity influences how students react to CALL. These results are difficult to generalize, however, as Robinson does not fully describe her procedures; she also fails to describe or even list the quantity of the participants in

her study.

Despite these shortcomings, Robinson (1990) makes a valid observation of the participants, warning of a phenomenon in social learning theory called *learned helplessness*. When the computer overwhelms a student by a vast assortment of beeps and error messages, and gives that student no locus of control by utilizing specific guides which show learners how to prevent future errors, a sense of learned helplessness can develop. This can have the effect of “...decreasing their judgments about their language ability, and of depressing subsequent motivation to continue” (G. Robinson, 1990, p. 157). By providing subjects with detailed feedback, which both informed them about the ungrammaticality of their responses and pointed to that which *is* grammatical, the study aimed to avoid this phenomenon.

In another study, Stevens (1989b) surveyed a sample of Arabic-speaking science majors at Sultan Qaboos University, most of whom had recently used computers for the very first time, to assess their attitudes toward using CALL software in their study of English. He created a questionnaire to answer four basic research questions:

- Do students enjoy using computers to study English?
- Do students find computer use to be an easy or a daunting task?
- Do students feel that they are making satisfactory progress in learning English by using the computers at the Student Resource Centre?

- Do students show increasingly positive attitudes with increasing exposure to computers?

Stevens' results indicate a resounding yes on all four questions. However, one concern with the study, which Stevens himself is apt to point out, was the quasi-experimental design of the project. It is nearly impossible to prove hypotheses in a qualitative study. Also, it would be unwise to generalize the results, as only science students were used in the project; perhaps students who tend to think analytically (such as science majors) enjoy using CALL software, whereas global thinkers may not. Regardless, Stevens' study may be useful in identifying a trend toward positive attitudes toward CALL.

Finally, Brandl (1995) conducted a study that demonstrated positive learner attitudes when participants were able to choose the kind of feedback they received. He identified 21 students from two first-year sections of German as High Achievement (HA) and Low Achievement (LA) students. Brandl accomplished this by administering the American Association of Teachers of German (AATG) Placement Exam, and excluding from the study all students who scored between 76% and 83%. Brandl revised his *German Passive Voice Tutor* to allow subjects to choose the following methods of feedback for wrong answers: metalinguistic, right/wrong, error feedback (in which all incorrect words were highlighted by the program), and being shown the correct answer.

After treatment, Brandl conducted interviews with subjects to discover their attitudes in using the software. He structured the questions on a three-point ordinal scale (as interpreted by the interviewer), ranging from 0 (not at all) to 2 (very much). The results of several of the questions are visible in Table 1.

Table 1. Means (Standard Deviations) from Brandl's follow-up interviews (p. 205).

Statements used by interviewer to Assess Student Opinion	High Achievers n=8	Low Achievers n=10
The program was helpful.	2.00 (0.00)	1.88 (0.35)
I liked to explore errors.	2.00 (0.00)	1.50 (0.93)
The grammatical feedback was helpful.	.88 (0.83)	.43 (0.79)
I felt I had understood the forms and concepts of passive voice before doing the exercises.	1.63 (0.52)	.50 (0.76)
I felt I had understood the forms and concepts of passive voice better afterwards.	2.00 (0.00)	1.50 (0.53)
The exercise helped me a lot to practice forms.	2.00 (0.00)	1.71 (0.49)
The exercise helped me a lot to think about my mistakes.	2.00 (0.00)	2.00 (0.00)
I felt frustrated.	1.60 (0.89)	1.29 (0.95)

Although subjects did not feel they had benefited much from the metalinguistic feedback, Brandl's results show a marked perceived improvement after treatment, both in the HA and LA groups. While the high rate of frustration among learners is a cause of concern, the learners' high perceptions of improvement support the third hypothesis. CALL software, if well-designed, can yield positive attitudes among its users.

Chapter 3

METHODS AND PROCEDURES

Institutional and Classroom Settings

This experiment took place at Michigan State University, a large public university enrolling approximately 40,000 students. The pre-test and post-test portions of the experiment were conducted in the subjects' normal German classrooms, which were nearly identical in terms of size and the equipment contained therein. All German classrooms were located in the same building. The computerized portion was conducted in the Macintosh-equipped Language Learning Center in the Old Horticulture building. Many of the students had no familiarity with the lab prior to the experiment. With every experimental group, I gave a brief introduction to the lab facility prior to treatment.

Subjects and Researchers

The subjects of the experiment were enrolled in four sections of German 102, a second-semester continuation of beginning-level German, totaling 83 students. I randomly assigned each of the four participating course sections to a specific group. Although predominately freshman and sophomore students fill these sections, upperclassmen also participated in this study; see table 2 for the percentages in each section.

Table 2. Class percentages in each group.

	Control	Metalinguistic	Right/Wrong	Reflection	Total
Freshmen	36%	61%	33%	37%	43%
Sophomores	14%	6%	40%	25%	20%
Juniors	21%	17%	27%	25%	22%
Seniors	29%	10%	0%	13%	13%
Graduate Sts.	0%	6%	0%	0%	2%

As is clear from table 1, there was a disproportionate number of freshmen in the metalinguistic group. Although I used intact classes in this study, I believe that the class standing of participants had little or no effect on the overall results.

Subjects were given instruction on relative clause formation in their German classes approximately two weeks prior to the pre-test. A total of 63 participants remained in the study after attrition: 14 students participated in the control group, 18 subjects made up the metalinguistic group, 15 subjects participated in the right/wrong group, and the reflection group consisted of 16 participants. The pre- and post-attrition numbers for each group are listed below in table 3.

Table 3. Rates of attrition for each group.

Group	Pre-Attrition	Post-Attrition
Control	17	14
Metalinguistic	24	18
Right/Wrong	21	15
Reflection	21	16

As noted in the table 4, below, instructor A taught both an

experimental and a control section. All instructors were teaching assistants enrolled in the German graduate program at Michigan State University, had less than three years teaching experience, and were under the age of thirty. However, Instructor B is a native speaker of German, whereas the other two instructors have English as their L1.

Table 4. Instructors and groups.

Section	Instructor	Group
1	A	Control
2	A	Metalx feedback
3	B	Right/Wrong feedback
4	C	Metalx feedback+reflection

Procedures for the Protection of Human Subjects

Following procedures prescribed by the University Council on Research Involving Human Subjects (UCRIHS), all subjects signed a consent form prior to the pre-test. I adhered to all guidelines stipulated by this committee, as described in the consent form itself. The complete participant consent form can be found in Appendix F.

Method

Pre-test

After completing the consent form, a standardized paper-and-pencil pre-test (Appendix A) was administered to all subjects, who entered their student number and section number on the test for identification purposes. The test contained ten multiple-choice and

ten cloze items, and aimed to evaluate subjects' pre-existing knowledge of relative pronouns, in order to make certain that the groups demonstrated roughly equal initial ability. The cloze items were added for the purpose of testing not only recognition of the grammatical forms, but also the production of those forms; I wished to ascertain if the treatment, which contained only recognition items, had any effect on production ability. Upon completion of the pre-test, subjects were required to complete a brief survey form about their attitudes toward computer use; I needed to ascertain pre-treatment attitudes before making any claims about attitude improvement. This form can be found in Appendix D.

Treatment

All three experimental groups underwent two separate treatments in the Macintosh lab. The two treatment sessions consisted of two separate HyperCard stacks, which I programmed with HyperCard 2.3. Each stack featured thirty multiple-choice items designed to improve subjects' ability to accurately select all types of German relative pronouns, with the exception of the genitive, as subjects are not taught the genitive case at Michigan State until the second year of instruction.

I chose relative pronouns as the target structure in this study for two reasons. First, from a practical standpoint, relative clauses are taught during the second semester of beginning-level German, and I therefore knew that all students had exposure to this structure.

More importantly, it is important for students to discover the way relatives pronouns in German contrast with those in English; unlike English, correct relative pronoun selection in German necessitates a base knowledge of the German gender and case system. I provide examples of this in the following paragraphs. While the word order of German relative clauses tends to give English speakers the most trouble (Kufner, 1962), I avoided this problem by providing the base sentence structure, thus giving my subjects the sole responsibility of selecting the correct pronoun.

I chose to use only declensional relative pronouns when designing the treatments. Other relative pronouns, such as *wer* (*wen*, *wem*) , as well as *wo*- compounds, were omitted from the study, since they are not taught in the students' first year at MSU, at least not within the context of the relative clause. In addition, the declensional relative pronoun is more commonly used³ .

For those with less familiarity with the formation of relative pronouns in German, Zorach & Melin (1994) list a series of steps which students can follow to assist them in producing the correct German relative pronoun in a particular context. First, students must find the antecedent to which the relative pronoun refers. Then they need to determine the number and gender of the antecedent, since this determines number and gender of the relative pronoun. Finally, the students must determine the function (subject, object, etc.) of the

³Hellinger (1977) notes that the use of *wo*-compounds is waning in modern German.

relative pronoun within the relative clause, since function determines case. The declensional forms of relative pronouns are listed in table 5, below.

Table 5. Declensional forms of relative pronouns.

	SINGULAR			PLURAL
	masculine	neuter	feminine	masc/ ntr/ fem
Nominative	..., der	..., das	..., die	..., die
Accusative	..., den	..., das	..., die	..., die
Dative	..., dem	..., dem	..., der	..., denen

While only indirectly bearing on my hypotheses, clause type is also a factor which should be kept in mind during treatment design. The inclusion or exclusion of specific clause types in the treatment can have drastic effects on the results. Keenan & Comrie (1977) demonstrated this in their theory of the Accessibility Hierarchy, a means of expressing the relationship between different kinds of relative clauses. The hierarchy is outlined here:

Subject Clause > Direct Object Clause > Indirect Object Clause > Object of a Preposition Clause > Genitive Clause > Object of a Comparison

In their study of linguistic differences between languages, Keenan & Comrie made the following discoveries:

- All languages have subject relative clauses.
- If a certain language has a kind of relative clause, it will also have every clause type that is further left on the hierarchy (i.e. if a language permits a genitive clause, it will also have a direct object clause).

- Clause types become increasingly difficult for L2 learners as one goes further to the right in the hierarchy (i.e. indirect object clauses are more difficult to acquire than subject clauses).

Several scholars have tested this theory empirically, most notably Gass (1979), as well as Aarts & Schils (1995). With the exception of genitive clauses, which Gass assesses to be further to the right on the hierarchy than Keenan & Comrie assert, they have found the Accessibility Hierarchy to be essentially accurate.

German permits all of the above relative clause types, with the exception of object of a comparison; this particular clause type is also questionable in English (“David is the man that I’m smarter than”). In addition, no genitive clauses were used in the study, as German students at MSU receive no classroom instruction on the genitive case until their second year. Although participants may have had exposure to the genitive case elsewhere, it is not the purpose of this study to assess the effect of instruction, but rather to determine how feedback type can improve the accurate selection of relative pronouns types to which subjects have already been exposed. The subjects in this instance are not necessarily familiar with genitive clauses.

Upon reexamination of the treatment and test questions, it quickly became clear that subjects had been tested most on the clause form in the study that was the most difficult to acquire: object of a preposition. Out of the sixty relative clauses in the two

treatment sessions, 17 were subject clauses, 11 were direct object clauses, only 3 indirect object clauses appeared, and 29 object of a preposition clauses were presented. Out of the forty post-treatment test questions, 11 were subject clauses, 6 direct object clauses appeared, only one indirect clause was given, and 22 of the 40 questions dealt with object-of-a-preposition clauses. The percentages of each clause type are listed in Figures 3 and 4.

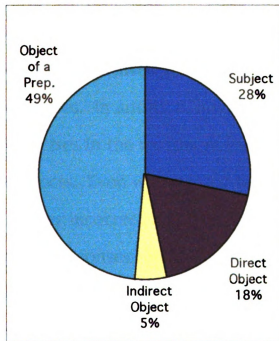


Figure 3. Treatment questions.

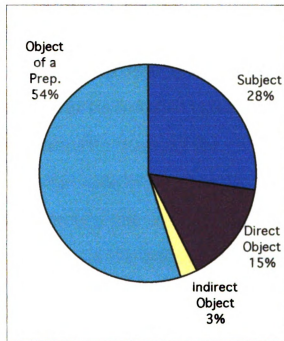


Figure 4. Post-treatment test questions.

I was unaware of the Accessibility Hierarchy when designing this study, and as a result the treatment of clause types is clearly unbalanced. Nonetheless, the Accessibility Hierarchy proposes that subjects would generalize their knowledge of object of a preposition-type clauses to easier clause forms, and I anticipated that my results

would corroborate this. The groups' accuracy of each clause type on the post-tests is discussed in chapter 5. My expectation that subjects would generalize their knowledge to easier clause types is supported by a study which is discussed in detail in the previous chapter; Doughty (1991) treated subjects only with object of a preposition clauses. When she gave a post-test, which covered an array of relative clause forms in English, she discovered that the subjects had generalized this knowledge to the easier relative clause forms.

I included no cloze items in the treatments, due to the technical difficulty involved with supplying metalinguistic feedback on such exercises. In addition, it was feared that the inclusion of cloze exercises in the treatment would unnecessarily frustrate the subjects. Even with guided feedback, when subjects continually answer incorrectly, they could possibly become discouraged, and their responses could thus become more and more haphazard. Cloze items were, however, part of the pre- and post-tests for the purpose of determining whether subjects can generalize the acquired knowledge during treatment to new contexts. Subjects were required to proceed in a linear fashion through the exercise. However, the material was presented in no particular order in regard to case.

When constructing the treatments, care was taken to make the program aesthetically pleasing, while still keeping it visually simple. Higgins & Johns (1984) suggest that visual rewards for a correct

response, such as a graphic fireworks display, or gushing textual congratulations (“Wow! You’re a genius!”) can easily become at best tiresome, at worst condescending. Taking this idea even further, Stevens (1989a) suggests that the “wow-effect” of these visual rewards is always disturbing, stating that eventually “...the novelty wears off, and student users do not ... spend any more time with redundant and repetitive courseware than they do with the books on which such courseware is based” (p. 32).

For every question, subjects had four possible answers from which to choose, and only one response was correct. For every wrong answer, subjects in the metalinguistic group were supplied with metalinguistic feedback (in English), consisting of grammatical rules and additional clues as to why the chosen answer was incorrect. When subjects in the reflection group entered incorrect responses, they were instructed to postulate and then enter their thoughts into the computer, using a special text field within HyperCard, as to why their answer may have been erroneous. Upon returning to the exercises, these subjects also received metalinguistic feedback. Subjects in the right/wrong group, upon selecting a response, were informed only whether the chosen response was right or wrong, with no other corrective feedback of any kind, and were asked to try again if the answer was deemed incorrect. The control group, which was added for the purpose of controlling a test repetition effect, received no treatment.

To illustrate the above conditions within the context of the program, consider the following example from the second treatment session:

1. Jim Morrison ist ein Rocksänger, _____ an Drogen gestorben ist. (Jim Morrison is a rock star who died from drugs)

- a. dem
- b. der
- c. den
- d. das

In this case, the second option “der” is the correct response.

Let us suppose that a subject chose (c), which is incorrect. The actual computer responses for each of the three groups are listed below.

The metalinguistic feedback for the responses on all questions is listed in Appendices G and H.

Metalinguistic Group: “I'm afraid that's incorrect. Since the relative pronoun is the subject, the nominative is needed in this instance, not the accusative. Try again.”

Right/Wrong Group: “I'm sorry, that's incorrect. Give it another try.”

Reflection Group: “I'm sorry, that's incorrect. Please reflect on why you think your answer may have been incorrect, then click on the button marked 'reflect'. This will bring you to a page where you can write down your thoughts.” (Upon returning to the program, this group received the same feedback as the metalinguistic group).

Subjects in all treatment groups were allowed to select another answer if their previous choice was incorrect, and were allocated an

infinite number of 'tries'. Subjects were not allowed to proceed to the next item without having first ascertained the correct response for the current item.

Post-tests

A standardized paper-and-pencil post-test was administered immediately after the second treatment. It was similar to the pre-test in both form and content. This test is in Appendix B.

I also administered a delayed post-test approximately two weeks following the immediate post-test in order to examine subjects' retention of the information following treatment (Appendix C). Its form was similar to that of its predecessors.

Upon completion of the delayed post-test, subjects were required to fill out a survey form. All questions were on a five-point ordinal scale, with responses ranging from "strongly disagree" to "strongly agree". This survey form is available in Appendix E.

Dependent Variables

There are two dependent variables in this experiment. The first, namely the improvement in German relative pronoun selection, was determined by scores on the standardized post-tests. These scores were compared with scores from the pre-test to determine improvement.

The second dependent variable, subject attitudes, was assessed with two survey forms which accompanied the pre-test and the delayed post-test, and which questioned subjects on their enjoyment

and perceived benefit from the project.

Experimental Design

This study used the quasi-experimental model of a Control Group Pre-test - Post-test design. The employment of a pre-test aided in assuring that any inferences made about the groups after treatment were not the result of preexisting variables (Hatch and Lazarson, 1991).

The algebraic design for the groups, with X representing the pre- and post-tests and T representing the treatments, is as follows:

Table 6. Algebraic design of the treatments.

Metalx group	X1	T1	X2	X3
Metalx+reflection group	X1	T2	X2	X3
Right/Wrong group	X1	T3	X2	X3
Control group	X1	T0	X2	X3

The design reflects a standard pre-test, post-test, and delayed post-test, with varying treatments. All subjects received the exact same pre-test and post-tests, while their treatments varied.

Data Collection Procedures

I administered all pre-test, post-test, and survey material, and also collected this data. All software data, namely the text files from subjects in the metalinguistic+reflection group, were collected after they finished the exercise and exited the program.

Timing

The pre-test took place approximately three days prior to the

first treatment. Twenty minutes were allotted for subjects to read and sign the consent form, complete the pre-test, and fill out the survey. Each treatment lasted approximately twenty minutes, except in the case of the metalinguistic+reflection group, who had 35 minutes to complete the treatment, due to the additional time required to reflect and report on incorrect responses. For most subjects, exactly one week transpired between treatments. However, some subjects who missed one of the treatments or post-tests agreed to come in at an alternate time and make up the treatment. The immediate post-test took place on the day after the second treatment; subjects had fifteen minutes to complete it. The delayed post-test followed two weeks after the immediate post-test. Subjects had fifteen minutes to hand in the delayed post-test along with the final survey.

Chapter 4

RESULTS

In this chapter, I have outlined the results of my data analysis. The results section is divided into three portions. The first portion summarizes the data from the pre-test and post-tests; its purpose is to chart the improvement of subjects both within and between groups, to see if hypotheses 1 and 2 are verified or not. The second portion, which directly pertains to hypothesis 3, charts the outcome of the survey data taken from participants' questionnaires. In the third portion, I analyze the reflective writings of the reflection group for clues about the hidden motives and thought processes behind subjects' choices.

Post-Treatment Test Results

The mean scores of all groups on the pre-test were roughly equivalent, as outlined in table 7. Subjects' recognition of the target forms were clearly stronger than their production of them. This is to be expected. Several researchers have noted that input, under the right conditions, can lead to intake (recognition), where it is available for hypothesis testing and then output (Long, 1981; Schachter, 1983, VanPatten & Cadierno, 1993). In addition, it is Tomlin & Villa's (1994) assertion that a target structure must be detected

(recognized) before it is available for further processing (hypothesis formation, and ultimately, production). All numbers represent point scores: ten points were possible in the recognition section, as well as ten points in the production section, thus giving the pre-test (as well as both post-tests) a total of twenty points.

Table 7. Mean pre-test scores of all groups.

Group	Recognition	Production	Total
Control	5.36	3.93	9.29
Metalinguistic	5.61	4.11	9.72
Right/Wrong	5.13	3.6	8.73
Reflection	5.81	4.38	10.19

As is clear in the above table, subjects were much more able to recognize the target structure than to produce it, and this relatively weak production ability appears to have negatively affected their overall scores. The total mean score for the groups ranged from 8.73 (Right/Wrong) to 10.19 (Reflection); even the highest-scoring group achieved only roughly half of the total possible points.

Chi-square analyses

In analyzing the data, a number of statistical tests based on the non-parametric chi square measure were performed in order to determine the relationship between groups in regard to post-treatment performance. In statistics, a chi-square test is used to test the relationship of nominal variables. Nominal data is data that can be separated into categories, e.g. subjects who improved versus those

who did not. These are listed as frequencies. Without the use of statistical analyses, frequency data alone may be misleading, since there are several factors involved in examining differences in variables. Therefore, a chi-square test is necessary in determining how different these frequencies must be before any relationship between variables can be claimed.

On each of the two test sections, recognition and production, I deemed an improvement of +3 to be significant for the purposes of this study. In either of the sections, if a subject improved by three points, she/he was labeled a “developer”. “Non-developer” indicates a subject who improved by fewer than three points, or who experienced no improvement whatsoever. It is important to note that the +3 score improvement is an arbitrary figure⁴, which I used only to classify the subjects as either developers or non-developers. In each group, the number of developers versus non-developers was listed, and a chi-square analysis was used to determine significance. It is important to note that statistical significance on a chi-square only indicates a relationship between variables; it in no way implies a cause-effect relationship.

Only one chi-square test demonstrated a significant result. In the production aspect, the number of developers between the pre-test and the immediate post-test differed significantly. In this particular analysis, I merged the metalinguistic group and reflection

⁴Several recent SLA studies assign arbitrary measures to indicate development (Mackey & Philp, 1998).

group for testing purposes. As previously mentioned in chapters 2 and 3, the reflection group had access to the same metalinguistic feedback as the metalinguistic group. I aimed to test the relationship between those who received metalinguistic feedback and those who did not. The number of developers and non-developers for this test are listed in table 8. The result of the chi-square indicated a P-value of 0.029, thus establishing significance. The statistical results of the chi-square can be found in Appendix G.

Table 8. Developers vs. non-developers for chi-square test: production, pre-test to immediate post-test. (C=Control, Mx=Metalinguistic group, R/W=Right/Wrong group)

Groups	Developers	Non-Developers	Total
C	2	12	14
Mx+Refl	17	17	34
R/W	9	6	15
Total	28	35	63

Therefore, those groups which read the metalinguistic feedback cultivated significantly more developers than the groups which had no such feedback.

ANOVA Analyses

In another set of analyses, I chose to examine the between-group relationships of all subjects by utilizing a one-way ANOVA test. I used a one-way ANOVA, in contrast with other analyses of variance, because I had only one dependent variable and one independent variable for testing my first two hypotheses. The

purpose of an ANOVA test is to explain the variance of a dependent variable (in this case, accurate relative pronoun selection, as measured by the pre-test and post-tests) in terms of one independent variable (the kind of feedback received) with three or more levels (treatment groups). An ANOVA determines whether the variation between these groups outweighs within-group variation. I ran four separate procedures, as noted in table 9, below. As with the chi-square, a one-way ANOVA procedure can only spot differences between the groups. It cannot report exactly where such differences lie; a post-hoc multiple-range test (such as the Tukey test) is required to pinpoint the source of differences.

Table 9. Kinds of ANOVA procedures run.

Pre to Imm. Post-test	Recognition
Pre to Imm. Post-test	Production
Pre to Delayed Post-test	Recognition
Pre to Delayed Post-test	Production

In each test, a single score was given to each subject: in each section of the two test sections (recognition and production) all subjects' pre-test scores were subtracted from their post-test scores (either immediate or delayed, depending on the test). For example, if a subject scored 4 points on the recognition section of the pre-test, then achieved 7 points in the same section on the immediate post-test, her/his improvement score would be 3 from pre-test to immediate post-test in the recognition section. The numbers, means,

and standard deviations of the results are outlined in tables 10, 11, 12, and 13, below. A column graph, which can be viewed in figure 5, makes the differences more easily detectable. The treatment groups make up the X-axis; the Y-axis consists of score improvement in the recognition and production sections between two tests: pre-test to immediate post-test (P-I) or pre-test to delayed post-test (P-D).

Table 10. Score improvement in the recognition section, pre-test to immediate post-test.

Group	N	Mean	StDev
Control	14	0.071	1.730
Metalinguistic	18	1.000	1.749
Right/Wrong	15	1.400	1.844
Reflection	16	1.187	1.759

Table 11. Score improvement in the production section, pre-test to immediate post-test.

Group	N	Mean	StDev
Control	14	1.429	3.204
Metalinguistic	18	2.889	2.111
Right/Wrong	15	2.533	1.995
Reflection	16	2.250	2.840

Table 12. Score improvement in the recognition section, pre-test to delayed post-test.

Group	N	Mean	StDev
Control	14	0.714	1.590
Metalinguistic	18	1.833	1.855
Right/Wrong	15	1.800	1.897
Reflection	16	1.688	1.740

Table 13. Score improvement in the production section, pre-test to delayed post-test.

Group	N	Mean	StDev
Control	14	2.214	2.887
Metalinguistic	18	2.278	2.244
Right/Wrong	15	1.600	1.639
Reflection	16	1.312	2.845

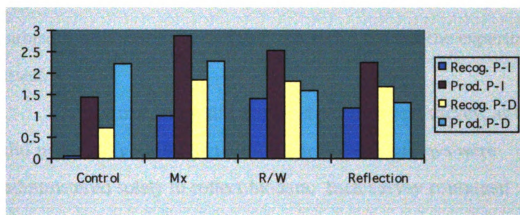


Figure 5. Improvement in test scores between groups and between tests. (Mx=Metalinguistic, R/W=Right/Wrong).

Although some post-treatment improvement took place in all groups (even control), none of the tests showed any significant variation between groups. In the following chapter, I shall explore potential procedural limitations that may have influenced the results, as well as suggestions for future research.

Survey Results

As previously stated, the pre-test and post-test surveys provided valuable information about subjects' attitudes toward using the computer, both in general and within a CALL context. The

survey forms, which can be found in Appendices D and E, predominately used a five-point ordinal scale to determine the attitudes of subjects on a variety of related topics. A lower score indicates agreement, a higher score disagreement. The pre-test survey assessed initial attitudes about computers and their applications in the classroom, whereas the post-test survey examined subjects' own assessment of their attitudes toward the experiment itself.

The control group did not receive a post-test survey, as they did not undergo treatment, and their pre-test surveys were administered solely to collect biodata. Each survey contained approximately 12-14 questions, but due to flaws in the design of these questionnaires, I could obtain few reliable results.

Despite this limitation, subjects gave interesting responses to a question on the post-test survey which asked them to assess their own post-treatment changes in attitude: "My attitudes toward using a computer in the second language classroom have improved since this study began." All reported slightly improved attitudes, as outlined in table 14 (with a score of 3 indicating a neutral stance, and a lower score indicating improved attitude). In addition, the range of responses that participants gave is also included.

Table 14. Post-treatment attitude improvement among groups.

Group	Im pr. Attitude	Range
Metalinguistic	2.22	1-3
Right/Wrong	2.27	1-4
Reflection	2.38	1-3

Although the mean scores on this question were roughly equivalent, the range of given responses demonstrated that the right/wrong group was the only group which contained subjects who disliked the courseware.

Regardless of whether subjects actually gain additional linguistic competence from participating in the treatment sessions, monitoring their perceived improvement is also a valuable resource in determining the effectiveness of any courseware package. The perception of improvement and a belief in the effectiveness of the software, in addition to enjoyment, can be a powerful motivational factor in continuing to use it.

As such, the next question addresses subjects' perceptions of their own improvement and current competency specifically in the area of German relative clauses. For, in addition to the enjoyment of and actual linguistic gain from the courseware, its effectiveness should also be determined by the perceived gain. If students feel that they have not advanced in some way after undergoing treatment, what will prevent them from losing interest in the software? Listed under question #3 on the post-test survey form,

subjects were asked to respond to the statement, “My mastery of German relative clauses has greatly improved since this study began.” The results are listed below in table 15.

Table 15. Subjects’ self-assessed improvement in relative pronoun selection.

Group	Perceived Benefit	Range
Metalinguistic	2.17	1-3
Right/Wrong	2.87	2-5
Reflection	2.38	2-4

The difficulties experienced by the right/wrong group also seem apparent in this question. For not only is their mean response significantly higher (more negative) than the other two treatment groups, a few subjects flatly disagreed with the assertion that any improvement took place at all, as is clear by the R/W group’s range of responses. By the same token, the reflection group’s response range also included dissenting opinions, although all groups’ mean scores were essentially positive. A column graph charting subject responses to both questions is located in figure 6, below. The graph numbers have been reversed to facilitate viewing.

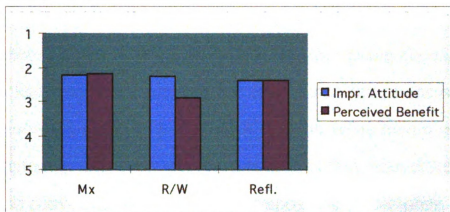


Figure 6. Post-treatment attitude and perceived benefit on an ordinal scale of 1 to 5. (Mx=Metalinguistic group, R/W=Right/Wrong group).

Subjects' Reflection

In the previous two portions, I have cited the results of both the testing and survey data, to see how the treatment affected the subjects' performance and attitudes. Although the reflection data does not pertain directly to my three hypotheses, an examination of the data does reveal some interesting details about subjects' thought processes during treatment (possibly pointing to aspects about the courseware that could be improved), as well as their feelings about the courseware, thereby indirectly pertaining to my hypotheses.

Despite this, the software data from the reflection group itself will only be briefly noted here; the act of reflection and production in itself is the most important aspect for the purposes of this study. However, the students were told that the software data would be collected, with the anticipation that subjects would exercise greater care in the formulation of their written responses.

In the reflection treatment, students were instructed to list the item number of the problem they were writing about, and to give a clear, concise possible reason for their incorrect answer. Although most complied with these instructions, some item numbers were missing, and a few wrote explanations that were either too brief or so convoluted that they were impossible to decipher. A few subjects wrote nothing at all.

In the first treatment session, 17 out of 21 subjects correctly identified at least one of their errors in the reflection portion. In the second, 11 of 19 correctly identified at least one error. In the first treatment session, only 8 subjects responded with “I don’t know,” and in the second session, this number dropped to 5. Several of the subjects correctly identified at least half of their errors, possibly selecting their responses less impulsively in the future.

Summary

To briefly summarize the results, several statistical analyses were carried out in order to chart between-group improvement on post-treatment test scores. In the production aspect, from pre-test to immediate post-test, there were significantly more developers in the groups that received metalinguistic feedback as opposed to those that did not, as revealed by a chi-square test. I also ran several ANOVA tests to determine the difference in mean improvement between groups, but there appeared to be no significant difference. While the mean attitude improvement between groups appeared to

be roughly similar, the right/wrong group contained participants who believed they had not benefited at all from the software.

Despite this, all experimental groups' mean attitude improvement, as well as perceived benefit, were positively slanted.

Table 16. Summary of the results in regard to the three hypotheses.

Hypothesis 1. Students who utilize a computerized program focusing on relative pronouns, and featuring metalinguistic feedback, will score significantly higher on a post-test which tests them on these forms than students who only receive right/wrong feedback and are not instructed to reflect on their responses. Hypothesis 2. Students who only receive indications of correct/incorrect responses from the computer and who are required to reflect on their incorrect responses, so that they may determine for themselves why the responses are incorrect, and then receive metalinguistic feedback, will score higher than subjects who only receive metalinguistic feedback. Hypothesis 3. Subjects in the two groups who receive metalinguistic feedback will report both greater enjoyment and greater perceived benefit of their CALL experience on a standardized post-test survey than those students in the right/wrong group.	Result: Not supported. Only one of the statistical measures carried out reported any significant difference between those groups which received metalinguistic feedback and those which did not. In general, there was no significant difference between groups in regard to degree of improvement. Result: Not supported. In fact, those subjects in the reflection group did not even show as great of a tendency toward improvement as the right/wrong group. Result: Supported, but results are difficult to generalize. Subjects who received metalinguistic feedback demonstrated a greater attitude improvement than those in the right/wrong group, but these results are a) quantitative and b) from a flawed survey design.
--	--

Chapter 5

DISCUSSION

This chapter is divided into four sections. The first two sections address hypotheses 1 and 2. In section 1, I discuss the implications of the pre-test and post-test results for these hypotheses. Although the data obtained did not support them, I did gain valuable insight into the manner in which task type can influence acquisition; it is clear from the results that students who can practice the recognition of a target structure are then able to more accurately produce that structure. In addition, subjects seemed able to generalize their knowledge to easier clause types, which lends support to the Accessibility Hierarchy. However, to compile further data which might support the original hypotheses, I would recommend future research be carried out in this study, redesigned to constrain variables which I had not taken into account. I discuss these factors as they relate to hypotheses 1 and 2 in the second section. Sections 3 and 4 of this chapter address hypothesis 3. In the third section, I examine the results of the survey data within the context of improvement in attitude and perceived benefit, to see if hypothesis 3 is supported. The fourth section, which discusses the reflection data, also applies to hypothesis 3, albeit to a lesser extent.

Section I: Discussion of Pre-test/Post-test Results

Despite the general improvement of all groups, hypothesis 1 does not seem to be supported by the results. With the exception of the control group, which lagged behind the others, none of the groups experienced a significant between-group difference in improvement. The significant result of the production chi-square from pre-test to post-test does little to establish whether the metalinguistic feedback brought about greater improvement in production; the right/wrong group also had a high number of developers (60% of the total N, as indicated in table 6). Thus, for the groups which received metalinguistic feedback, the salience of the feedback did not lead to improvement that exceeded that of the right/wrong group. However, some valuable observations can be drawn from the results.

As is clear from the post-test results, virtually all subjects displayed some form of improvement after treatment (as demonstrated in figure 3). Even the scores of the control group indicated a slight trend toward improvement, which may demonstrate that exposure merely through testing can lead to some marginal improvement in relative pronoun selection. This phenomenon, called the “testing effect,” refers to the process by which testing alone can produce learning (Kuo & Hirschman, 1997). However, this had little effect on the overall results; as the gains of the experimental groups were generally far above those of the control group, the treatments clearly facilitated improvement.

Although none of the groups performed significantly better than the other groups on the post-tests (as determined by the ANOVA), every group demonstrated a trend toward improvement (consult tables 8-11 for means and standard deviations). It would appear from these analyses that the kind of feedback subjects received in the study played only a marginal role in their improvement in relative pronoun selection.

However, as indicated by the significant result on the production chi-square test from pre-test to immediate post-test, there was a much larger number of developers in the groups which received metalinguistic feedback (metalinguistic and reflection groups) as opposed to those which did not (as shown in Appendix G), although these groups were not given production-oriented tasks during treatment. However, the right/wrong group also received no production tasks in treatment, and as previously stated, they also had a large percentage of developers. With these factors in mind, it may be inferred that subjects did generalize their recognition experience in the two treatment sessions to another context, namely the cloze sections of the post-tests. Despite Sharwood Smith's (1991) notion that the internalization of negative evidence does not necessarily lead to the correct production of that target form, the negative feedback clearly helped many subjects improve their production ability of relative pronouns in this case. However, it is also important to note the subjects' production scores on the pre-test

were much lower than their recognition scores, so the production scores had considerably more room for improvement.

As for the gains of the reflection group, the results of the study do not support hypothesis 2, either. Giving subjects time to reflect seemingly did nothing to improve their relative pronoun selection capabilities beyond that of the metalinguistic group; in fact, the reflection group was outperformed by the two other experimental groups in almost every area. It was anticipated that giving subjects an opportunity to reflect would help lessen the increased capacity for error that accompanies a high level of awareness (Tomlin & Villa, 1994). However, perhaps asking subjects to reflect after entering a response simply did not have the desired effect of thoughtful deliberation about their errors. It may have been more fruitful to require reflection before entering any response at all, as was the case in Meredith's (1978) study.

Although Keenan & Comrie's (1977) Accessibility Hierarchy only indirectly pertains to my hypotheses, I tallied the percentages of correctly answered items for each clause type in both of the post-tests. The results can be found in tables 17, 18, and 19.

Key: S=Subject clause, DO=Direct Object clause, IO=Indirect Object clause, OP=Object of a Preposition clause

Table 17. Percentages of correctly answered items in the metalinguistic group.

	S	DO	IO	OP
Imm. Post	82%	44%	n/a	64%
Delayed Post	78%	69%	67%	66%

Table 18. Percentages of correctly answered items in the right/wrong group.

	S	DO	IO	OP
Imm. Post	76%	40%	n/a	59%
Delayed Post	73%	65%	67%	54%

Table 19. Percentages of correctly answered items in the reflection group.

	S	DO	IO	OP
Imm. Post	76%	53%	n/a	67%
Delayed Post	69%	67%	69%	65%

Although most of the treatment items were object of a preposition clause types, it appears from the above tables that subjects in all treatment groups generalized what they learned from the treatments to the easier clause forms⁵. The only clause type that differs from the Accessibility Hierarchy in this case are direct object clauses. One possible reason for this stems from the nature of these clauses. While direct object relative pronouns in German generally require the accusative, both post-tests each had an item which contained the verb “helfen” (to help); although these are technically direct object clauses (and counted as such in the above tables), this particular verb requires the dative. Most of the subjects missed

⁵ Since testing the accuracy of the Accessibility Hierarchy was not originally part of this study, the distribution of clause types were uneven, and any such claims are thus impossible to demonstrate.

these two items, even though this verb is also found in both treatment sessions.

The total percentage of correctly answered items for all groups on both post-tests can be found in figure 7, below. This clearly shows a far more even distribution of clause types than in either the treatment sessions or the post-tests.

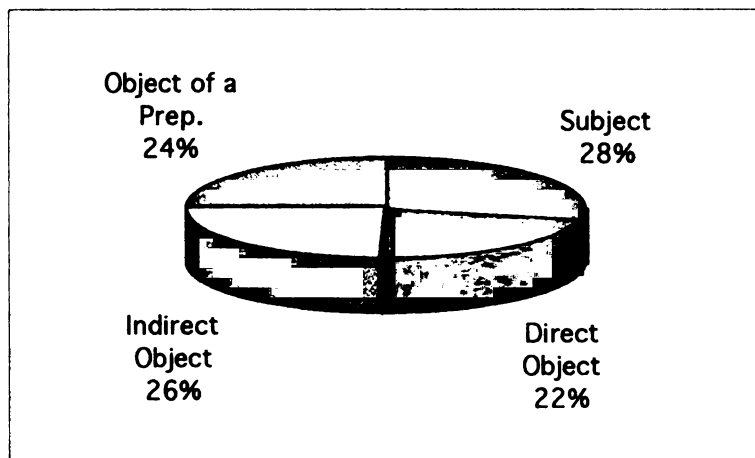


Figure 7. Clause type percentages of the total correct responses on the immediate and delayed post-tests.

Section II: Recommendations for Future Research

In the following paragraphs, I make recommendations for future research, discussing procedural limitations which may have impeded post-treatment improvement for the groups which received metalinguistic feedback. A new study, designed to take these limitations into account, may help to determine if those factors had an effect on the results in this study.

When examining subjects' reflection data, it became clear that a few subjects experienced problems understanding the grammatical

explanations from the metalinguistic feedback. As a researcher, I should not have assumed that students' are 1) knowledgeable about grammar to begin with, and 2) familiar with grammatical terminology. As Garrett (140) points out, it is often assumed that "knowing grammar" means a familiarity with the labels that linguists attach to grammatical structures. Garrett also asserts that the knowledge of these terms will not in itself lead to acquisition. Although I agree that this assertion is essentially true, I also acknowledge that subjects needed a base knowledge of both the grammatical content of relative clauses, as well as the terminology used in the treatment, to fully understand the metalinguistic feedback.

As for the first concern of grammatical knowledge, I knew that the grammar of relative clauses had been taught in subjects' German classes. The implementation of additional instructional materials in the treatment, in order to help subjects attain a base grammatical knowledge of relative clauses, would have tainted the collected data. The research instrument had not been designed to test the effect of instruction, and I would have had no means of determining if improvement had been a result of the negative feedback or the additional instruction. Although such a pre-treatment lesson would be highly desirable in a non-experimental context, it was unfeasible for this study.

However, in regard to the use of grammatical terminology, it

would have been useful to include a separate help section within the software to identify these terms. This could be accomplished in two different ways, each with its own set of advantages and disadvantages. When looking over the metalinguistic feedback for a particular response, hypertext buttons could be added so that when the term is clicked on, a brief definition appears in a pop-up window. In addition, an introductory tutorial would serve as a valuable resource not only for providing definitions, but also examples of what these terms represent in a given context. Hypertext pop-up windows provide explicit information, including, but not limited to, such items as definitions of grammatical terms, examples, and hints about the current question. Tutorials can provide all of the above as a single unit, although much of this information may be less relevant to the task at hand. The advantages and disadvantages of both approaches are listed below.

A tutorial would certainly be easy to implement, but subjects may have a tendency to skip over this introduction, possibly with no means of returning to it for reference when actually working through the exercises, when the information is particularly pertinent. Pop-up windows would eliminate this concern, but due to lack of space on the screen, such windows may not elaborate enough to be truly useful to the learner. Also, the addition of such hypertext links for each and every line of feedback would be a daunting and time-consuming task for the software designer. Perhaps an ever-present

button that, upon clicking, takes the user to a help screen would be a solution that offers the best of these two dimensions.

Another pitfall to be avoided by future research is the limitation of two treatment sessions for all groups. As Hatch & Lazarton (1991) state, “We know that even though we offer students instruction and they are able to perform well during the instruction period, they may not truly internalize the material unless it is recycled over a fairly long period of time” (pp. 93-4). It would have been highly desirable in this study to have at least three treatment sessions, but unfortunately, this was not possible; since all testing and treatment was completed during the subjects’ normal German classes, only a certain amount of time could be devoted to the experiment. While the project could have been designed to avoid this problem by scheduling testing and treatment outside of class time, the participant count would almost certainly have suffered. More treatment sessions could possibly contribute to more variation between treatment groups, as each kind of treatment would have the possibility of reaching the “ceiling” of its natural effectiveness.

Also, despite the fact that the uncontrolled variable of intact classes did not create a major problem in the study, students did score higher on the pre-test in some sections than in others (refer to table 5 in the previous chapter). Although it was unavoidable in this case, it is recommended that future samples be truly random.

Section III: Discussion of Survey Data

As demonstrated in tables 12 and 13 (as well as figure 4) of the previous chapter, all experimental groups demonstrated a slight post-treatment improvement in attitude and perceived benefit toward CALL. Chapelle and Jamieson (1989), citing various early studies, found that “questionnaire results typically - but not always - indicate favorable attitudes toward CALL” (p. 52). This tendency could indicate why subjects demonstrated generally positive attitudes toward the treatments.

However, it is important to keep in mind that the survey results are qualitative, and such qualitative data make it difficult to support empirical hypotheses, although the knowledge gained is still valuable. Also, due to the flawed design of the survey materials, most of the data could not be salvaged; it is nearly impossible to generalize any results obtained from only two questions.

Attitude Improvement

As indicated by table 12, the mean attitude improvement of all experimental groups was nearly equivalent (varying by less than 1/5 of one point), and all were generally positive. The right/wrong group’s score was only slightly higher (more negative) than that of the two metalinguistic groups. The right/wrong group’s range of responses seems consistent with this result, as it was the only group containing subjects who disagreed with the statement that they had improved, although no subjects strongly disagreed (as indicated by a

5 on the ordinal scale). Some subject's distaste of the software could be attributed to the fact that they, unlike the other two experimental groups, had no tools by which to ascertain the correct answer, other than haphazardly pressing buttons until they uncovered the correct response.

Perceived Benefit

Regardless of whether subjects actually experienced improvement from participating in the treatment sessions, monitoring their perceived improvement was also a valuable resource in determining the effectiveness of the CALL software. The perception of improvement and a belief in the effectiveness of the software, in addition to enjoyment, can be a powerful motivational factor in continuing to use it (Higgins, 1988).

In the perceived benefit section, there was slightly greater variation between groups than in attitude improvement. Again, the right/wrong group lagged behind the other two experimental groups. A few subjects even strongly disagreed with the survey statement that they had improved at all. Once more, this is likely due to the fact that these subjects were given no amount of aid in the recognition of their own errors. And thus, having no means of understanding why a given response was ungrammatical, they were left with only a single option when making an error: to randomly press buttons until they had stumbled onto the correct response.

Section IV: Discussion of Reflection Data

Upon examination of the reflection data, it was clear that while some subjects had been haphazardly pressing buttons with no reasoning behind their choices, others found the reflection exercise a valuable tool in discovering their own mistakes. Despite this, a few subjects used the reflection portion of the software to vent their frustrations about the program and about relative pronoun selection in general. These emotional proclamations, such as, “Confuzzled...” and, “Basically, I just suck at German,” are perhaps more telling about the subjects’ difficulties with the treatment than the survey forms, which showed that most of the subjects appeared to find the treatment sessions an enjoyable and beneficial experience. This is perhaps an indication of the more active role that the reflection group was required to take in its own feedback; this increased level of participation also meant that more time was needed for them to complete the treatment. It is therefore possible that the subjects in this group simply felt overwhelmed by the task, a possibility that will have to be addressed in future versions of the software.

Nonetheless, the subjects did seem to grow more confident as their experience with the program increased, as indicated by the fewer “I don’t know”-type responses in the second treatment session. It is uncertain, however, whether their ease can be attributed to more experience with the program (technological expertise) or to experience with relative pronoun selection (grammatical knowledge).

CONCLUSIONS

In conclusion, I have returned to the specific research questions outlined in chapter 1. The questions and responses are listed in table 20, below.

Table 20. Research questions and responses.

1. To what extent does the reception of metalinguistic feedback influence subject performance?	Response: None of the research findings indicated that supplying subjects with metalinguistic feedback boosted their performance on a post-test over that of the non-metalinguistic groups.
2. How does allowing the subjects extra time to reflect upon their incorrect responses affect overall performance?	Response: Giving subject reflection time after responding seemed to have no effect. Perhaps forcing subjects to wait before responding would have been more effective.
3. Is there a relationship between the kind of feedback received and the subjects' perceived benefit from the CALL exercise?	Response: The groups which received metalinguistic feedback felt they had benefitted more from the treatment than subjects in the right/wrong group. However, these results are difficult to generalize due to flaws in the survey design.
4. Is there a relationship between the kind of feedback received and the subjects' overall enjoyment of the CALL exercise?	Response: Subjects who received metalinguistic feedback generally reported greater attitude improvement, although the same limitation as in #3 applies here, also.

However, due to possible procedural flaws, other research questions come to light, which may aid in explaining the subjects'

lack of anticipated improvement:

- How might the addition of more elaborate means of feedback (i.e. help sections, tutorials, etc.) contribute to higher levels of improvement?
- Would additional treatment sessions help establish more score variation between groups?
- How does the kind of task contained in the CALL courseware influence subjects' acquisition of the target structure?
- How does the proportion of relative clause types affect subjects' overall improvement?

Dealing with the above questions could serve to determine if metalinguistic feedback and additional reflection can truly lead to improvement in relative pronoun selection. This study clearly merits further pursuit, but with larger numbers so that the results can be more easily generalized.

In addition, while conducting the study, I made two discoveries which, although only indirectly related to my hypotheses, could easily be utilized in future such studies. First, through measuring the percentage of correct answers for each clause type on both the immediate and delayed post-tests, I have found the Accessibility Hierarchy to be essentially accurate. With more careful manipulation of the clause types during treatment, a similar result could be more easily generalized. Also, I found that subjects who only have exposure to recognition tasks during treatment can adapt this knowledge, using it in more a productive manner later.

These are only two of the many additional items that arose when trying to answer my four specific research questions. By pursuing this study further, I could incorporate these additional questions in determining not only whether the kind of feedback leads to greater improvement, but also how learners use the feedback they are given, possibly pointing to learning strategies that are employed by students in their foreign language courses.

APPENDICES

APPENDIX A

APPENDIX A

Relative Clause Pre-Test

Please choose the correct response:

1. Das ist die Frau, ... ich gestern geholfen habe.
a) die b) das c) der d) dem
2. Ich habe dem Hund, ... vorgestern hier war, einen Ball gegeben.
a) der b) die c) dem d) den
3. Das ist die Firma, bei ... ich seit fünf Jahren arbeite.
a) dem b) der c) die d) denen
4. Mattias und Kirsten sind die Freunde, mit ... ich am liebsten zusammen bin.
a) der b) die c) denen d) dem
5. Deutsch ist der Kurs, für ... ich oft lernen muß.
a) dem b) das c) der d) den
6. Ich bin ein Mann, ... Sport nicht gern treibt.
a) den b) der c) dem d) die
7. Also bist du die Frau, von ... ich so oft gehört habe!
a) der b) die c) dem d) das
8. Das ist die Stelle, um ... ich mich bewerbe.
a) die b) das c) der d) den
9. Meine Firma ist das Gebäude, ... neben dem Postamt steht.
a) die b) der c) dem d) das
10. Deine Freundin ist die Frau, über ... ich so viel gehört habe.
a) der b) die c) den d) dem

APPENDIX A

Please enter the correct relative pronoun:

Mattias: Hallo Kirsten! Bist du die Frau, _____ die Stelle als Lehrerin bekommen hat?

Kirsten: Ja! Herr Adler ist mein Chef. Er ist der Professor, bei _____ ich letztes Jahr studiert habe.

Mattias: Ich finde, er ist etwas streng. Er war es, _____ mir letztes Semester eine 'F' in deutsch gegeben hat.

Kirsten: Also bist du es, _____ er die 'F' gab. Ich dachte, Susanne war die Studentin, _____ durchgefallen ist.

Mattias: Nein, das war ich. Aber ich bin nicht der Einzige, _____ ihn nicht mag. Er ist ein Professor, über _____ man immer Horrorgeschichten hört.

Kirsten: Das ist nicht fair von dir. Letztes Semester hast du das Buch nicht gekauft, _____ du für den Kurs lesen mußtest.

Mattias: Der Kurs, für _____ ich kein Buch gekauft habe, war Chemie. Ich habe alles für meinen Deutschkurs gelesen.

Kirsten: Aber trotzdem hast du nicht viel gelernt. Deutsch ist ein Fach, in _____ man viel arbeiten muß!

APPENDIX B

APPENDIX B

Relative Clause Immediate Post-test

Part 1 (10 Points). Please choose the correct response:

1. Julia ist die Studentin, ... ich mit der Hausaufgabe helfe.
a) der b) das c) die d) dem
2. Ich habe meinem Sohn, ... so brav war, ein Spielzeug gekauft.
a) dem b) die c) der d) den
3. Das ist das Haus, in ... sie wohnt.
a) denen b) der c) die d) dem
4. Otto und Maria sind die Leute, mit ... wir immer Karten spielen.
a) der b) denen c) die d) dem
5. Katja ist die Freundin, für ... du das Buch gekauft hast, oder?
a) dem b) die c) der d) den
6. Thomas ist ein junger Mann, ... gern Bier trinkt.
a) den b) die c) dem d) der
7. Siemens ist die Firma, bei ... Karl sechs Jahre lang gearbeitet hat.
a) der b) die c) dem d) das
8. Theater ist eine Karriere, an ... ich immer gedacht habe.
a) die b) das c) der d) den
9. Meine Firma ist das Gebäude, ... neben dem Postamt steht.
a) die b) der c) dem d) das
10. Das Auto ist ein Geschenk, über ... ich mich freue.
a) der b) das c) den d) dem

APPENDIX B

Part 2 (10 Points). Karl and Thomas are kicking around a soccer ball in the park, when they see someone they know. Please enter the correct relative pronoun:

Karl: He, Thomas, du trägst tolle Schuhe! Wo hast du sie gekauft?

Thomas: Dies sind die Schuhe, _____ ich von meinen Eltern zum Geburtstag bekommen habe.

Karl: Cool. Sind sie die Schuhe, von _____ Michael Jordan immer im Fernsehen spricht?

Thomas: Ja. Er ist der einzige Mann auf der Welt, _____ höher springen kann als ich.

Karl: Ach, wirklich? Dann müssen sie tolle Schuhe sein. He, sag mal, ist das nicht das Mädchen, mit _____ wir gestern im gesprochen haben?

Thomas: Ich glaube schon. Sie heißt Katja, oder? Ja, sie ist bestimmt das Mädchen, _____ gestern hier war. Hallo, Katja! (Sie kommt).

Katja: Hallo, Jungs!

Karl: Sag mal, bist du nicht die Frau, mit _____ wir gestern gesprochen haben?

Katja: Doch! Der Park ist eine Ort, in _____ ich mich immer wohl fühle.

Thomas: Warum mußttest du gestern so früh weggehen?

Katja: Ich mußte für meine Mutter einkaufen, _____ im Moment krank ist.

Karl: Was hat sie denn?

Katja: Sie hat die Grippe. Es ist eine Krankheit, _____ nicht leicht weggeht.

Thomas: Schade. Die Grippe ist eine Krankheit, von _____ man viel hört, aber ich habe sie nie gehabt.

Katja: Du hast Glück gehabt!

APPENDIX C

APPENDIX C

Relative Clause Delayed Post-test

Part 1 (10 Points). Please choose the correct response:

1. Frau Schmidt ist die Professorin, ... immer so viele Hausaufgaben gibt.
a) der b) das c) dem d) die
2. Das ist das Kind, ... du den Ball gegeben hast.
a) dem b) die c) der d) den
3. Der Koffer, in ... ich meine Andenken von Berlin habe, ist im Keller.
a) denen b) dem c) die d) der
4. Gabi und Klaus sind die Freunde, von ... du immer sprichst.
a) der b) denen c) die d) dem
5. Annas Bruder, für ... Anna einen Bierkrug gekauft hat, heißt Jeff.
a) dem b) die c) der d) den
6. Dieter ist ein Sportler, ... am liebsten Fußball spielt.
a) der b) die c) dem d) den
7. Das ist das Restaurant, in ... ich mein erstes 'Hamburger' gegessen habe.
a) der b) die c) dem d) das
8. Katrin ist die Frau, an ... ich immer wieder denke.
a) die b) das c) der d) den
9. Der Tisch, auf ... die Teller stehen, ist braun.
a) die b) der c) dem d) das
10. Das Theaterstück, ... wir sehen wollten, ist ausverkauft.
a) der b) das c) den d) dem

APPENDIX C

Part 2 (10 Points).

Gabi: Hallo, Klaus. Wie geht's dir?

Klaus: Gut. Die Firma, bei _____ ich arbeite, hat vielleicht eine bessere Stelle für mich - als Programmierer.

Gabi: Klaus, das ist die Stelle, _____ du immer wolltest!

Klaus: Ja, aber es gibt ein Problem, _____ mir die Stelle kosten konnte.

Mein Chef, _____ ein Idiot ist, will nicht, daß ich die Stelle bekomme.

Diese Stelle ist eine Gelegenheit, auf _____ ich immer gewartet habe. Hilf mir!

Gabi: Dein Chef, _____ ich letztes Jahr bei einem Projekt geholfen habe, ist sicher ein dummer Mann. Aber er mag mich. Vielleicht kann ich mit ihm reden.

Klaus: Ach, Gabi, du bist die tollste Frau, _____ ich jemals kennengelernt habe! Computerprogrammierer ist ein Beruf, von _____ ich immer geträumt habe.

Gabi: Ich werde morgen mit ihm sprechen. Willst du jetzt ins Kino gehen. Was war der Film, über _____ wir gestern gelesen haben?

Klaus: "Sophies Abenteuer". Das ist der Film, in _____ die Hauptfigur, Sophie, eine Reise nach Deutschland macht. Gehen wir!

APPENDIX D

APPENDIX D

Pre-Test Survey

Please answer the following questions:

1. Briefly describe your prior experience with German (high school, study abroad, tutoring, etc).
2. How much time do you spend studying German per day? _____
3. Please circle your class standing: Fr. Soph. Junior Senior Grad
4. Please briefly describe your prior experience using computers, particularly in an educational setting:
5. What is your native language? _____

Please read the following statements, and circle the number that best expresses your views.

Key: 1=strongly agree, 2=agree, 3=neutral, 4=disagree, 5=strongly disagree

- | | | | | | |
|---|---|---|---|---|---|
| 6. I feel that computers can be beneficial in learning. | 1 | 2 | 3 | 4 | 5 |
| 7. Computer use is essential to my everyday life. | 1 | 2 | 3 | 4 | 5 |
| 8. I enjoy using a computer. | 1 | 2 | 3 | 4 | 5 |
| 9. Computers are only good for video games and possibly word processing. | 1 | 2 | 3 | 4 | 5 |
| 10. Learning with the aid of a computer is more beneficial than learning by more traditional methods. | 1 | 2 | 3 | 4 | 5 |
| 11. Learning with the aid of a computer is more enjoyable than learning by more traditional methods. | 1 | 2 | 3 | 4 | 5 |
| 12. I dislike using computers because they're difficult to operate. | 1 | 2 | 3 | 4 | 5 |
| 13. Computers are impersonal. | 1 | 2 | 3 | 4 | 5 |
| 14. I use a computer at least four times per week. | 1 | 2 | 3 | 4 | 5 |

APPENDIX E

APPENDIX E

Post-Test Survey

1. Do you speak any other languages than your native language?

Which?

Please read the following statements, and circle the number that best expresses your views.

Key: 1=strongly agree, 2=agree, 3=neutral, 4=disagree, 5=strongly disagree

- | | | | | | |
|--|---|---|---|---|---|
| 2. I enjoyed working with the computer in this study. | 1 | 2 | 3 | 4 | 5 |
| 3. My mastery of German relative clauses has greatly improved since this study began. | 1 | 2 | 3 | 4 | 5 |
| 4. After working in this study, I feel that computer use should be commonplace in the language classroom. | 1 | 2 | 3 | 4 | 5 |
| 5. I think computers could be useful in learning many different grammatical forms. | 1 | 2 | 3 | 4 | 5 |
| 6. My attitudes toward using a computer in the second language classroom have improved since this study began. | 1 | 2 | 3 | 4 | 5 |
| 7. My attitudes toward using computers in general have improved since this study began. | 1 | 2 | 3 | 4 | 5 |
| 8. I found the program we used to be interesting and helpful. | 1 | 2 | 3 | 4 | 5 |
| 9. The use of the computer did not much help my understanding of German relative clauses. | 1 | 2 | 3 | 4 | 5 |
| 10. The study has worsened my attitude toward using a computer in the classroom. | 1 | 2 | 3 | 4 | 5 |
| 11. I did not enjoy using a computer in this study. | 1 | 2 | 3 | 4 | 5 |
| 12. I consider myself to be a good German student. | 1 | 2 | 3 | 4 | 5 |

APPENDIX F

APPENDIX F

Consent Form

This study will be testing the role of feedback, to see which kinds of feedback enhance performance and which do not. As a subject in this study, you will be required to complete some exercise and testing materials on the subject of German relative clauses. The data collected will be analyzed as part of the investigator's master's thesis. By signing this form, you consent to participate in the study, and give your permission for the investigator to use data obtained from your participation.

Please read over the following items **before** signing the form.

Be advised that...

- no time outside of your normal class time will be required of you for this study. In-class time spent on this study will be approximately 2.5 hours.
- you will be identified by your student numbers and by section number only, which will be known only to the investigator. All information will be held **strictly confidential**.
- by signing this consent form, you acknowledge that you are a willing participant in the experiment and thus give your permission for the experimenter to use the data collected from your participation.
- participation in the study is entirely voluntary, and that refusal (or willingness) to take part in the study will **In no way** affect your grade in this course. You may choose to discontinue your participation at any time.
- no beneficial effects of the treatment are guaranteed.
- you will not receive a grade for your performance on these tests. If you wish to know how you scored on the tests, please contact the investigator at one of the numbers below.

I fully understand the conditions of my involvement in the study, and I wish to participate.

Signature: _____

Date: _____

If you have any questions, comments, or concerns, contact **Daniel Park** at 353-7619 (office), 346-4907 (home), or e-mail him at: parkdani@pilot.msu.edu

APPENDIX G

APPENDIX G

Chi-Square Test Results

Production: Pre-test - Immediate Post-test

Expected counts are printed below observed counts

C1=Developers

C2=Non-Developers

Table 21. Chi-square figures, pre-test to immediate post-test.

	C1	C2	Total
Control	2	12	14
	6.22	7.78	
Metalinguistic	17	17	34
	15.11	18.89	
Right/Wrong	9	6	15
	6.67	8.33	
Total	28	35	63

Chi-Sq = $2.865 + 2.292 + 0.236 + 0.189 + 0.817 + 0.653 = 7.052$

DF = 2, **P-Value = 0.029**

APPENDIX H

APPENDIX H

Metalinguistic Feedback First Treatment Session

Before the actual feedback, a random response generator gives the subject an indication that the response was incorrect, i.e. "I'm sorry, that is incorrect". After the metalinguistic feedback, the random generator gives the subject some indication to try again, i.e. "Please try again." If the response was correct, the random generator provided a congratulatory message and asked the subject to proceed.

Key: **S**=Subject Clause, **DO**=Direct Object Clause, **IO**=Indirect Object Clause, **OP**=Object of a Preposition Clause.

1. Ist das die Frau, ____ wir gestern gesehen haben? (**DO**)
(Is that the woman we saw yesterday?)
 - a. der - "Sehen" is not a verb which requires dative.
 - b. dem - The antecedent "Frau" is feminine, and "sehen" is not a verb which requires dative.
 - c. die - (correct response)
 - d. das - The antecedent "Frau" is feminine, not neuter.
2. Der Mann, ____ du gestern kennengelernt hast, ist Julias Freund. (**DO**)
(The man you met yesterday is Julia's boyfriend.)
 - a. das - The antecedent "Mann" is masculine, not neuter
 - b. den - (correct response)
 - c. der - "Du" is nominative, because it is the subject within the relative clause. The relative pronoun, as the direct object, should be in the accusative.
 - d. dem - The relative pronoun, as the direct object, should be in the accusative.
3. Das ist der Bus, auf ____ wir seit zwei Stunden gewartet haben. Endlich kommt er! (**OP**)
(That's the bus for which we've been waiting for the past two hours. It's finally coming!)
 - a. dem - Since "dem" indicates the dative case, that would mean that you were waiting on top of the bus!
 - b. der - The verb "warten+auf" (to wait for) requires the accusative.
 - c. das - The antecedent "Bus" is masculine, not neuter.
 - d. den - (correct response)

APPENDIX H

4. Anja liest das Buch, von ____ Kirsten mir so viel erzählt hat. **(OP)**
 (Anja is reading the book that Kirsten told me so much about.)
- dem - (correct response)
 - das - The preposition "von" requires the dative.
 - der - Although you're right that the preposition "von" is dative, the antecedent "Buch" is neuter, not feminine.
 - den - The antecedent "Buch" is neuter, not masculine. Also, the preposition "von" requires the dative.
5. "Shine" ist der Film, in ____ Geoffrey Rush die Rolle des Pianisten David Helfgott spielt. **(OP)**
 ("Shine" is the film in which Geoffrey Rush plays the role of pianist David Helfgott.)
- den - Although "in" is a two-case preposition, in this instance the dative is required because there is no indication of motion.
 - der - Although you are correct that the relative pronoun should be dative, I'm afraid that the antecedent "Film" is masculine, not feminine.
 - dem - (correct response)
 - denen - Although you are correct that the relative pronoun requires the dative, I'm afraid that the antecedent "der Film" is singular, not plural.
6. Karin ist die Studentin, ____ ich immer mit den Hausaufgaben helfe. **(DO)**
 (Karin is student whom I'm always helping with homework.)
- der - (correct response)
 - die - You're probably forgetting that "helfen" is a verb which requires dative.
 - dem - Although you're correct that the relative pronoun should require the dative, the antecedent "Frau" is feminine.
 - denen - Although you're correct that the relative pronoun should be dative, the antecedent "Frau" is singular, not plural.
7. Deutsch ist das Schulfach, mit ____ ich die meisten Probleme habe. **(OP)**
 (German is the subject with which I have the most problems.)
- denen - While it is true that "mit" is a preposition that requires dative, the antecedent "Schulfach" is singular, not plural. "Mit denen" would indicate the plural.
 - dem - (correct response)
 - das - The preposition "mit" requires the dative.
 - den - That's incorrect, for two reasons: First, the preposition "mit" requires the dative. Second, the antecedent "Schulfach" is neuter, not masculine.

APPENDIX H

8. Dieses Fahrrad was das Geschenk, über ____ ich mich als Kind am meisten gefreut habe. (OP)

(This bicycle was the gift that made me the most happy as a child.)

- a. die - The antecedent "Geschenk" is neuter, not feminine.
- b. den - Although it's true that the verb "sich freuen + über" requires the accusative, the antecedent "Geschenk" is neuter, not masculine.
- c. dem - The verb "sich freuen + über" (to be happy about) requires the accusative case.
- d. das - (correct response)

9. Dr. Lovik, ____ mein Lieblingsprofessor ist, hat ein neues Buch geschrieben. (S)

(Dr. Lovik, who is my favorite professor, wrote a new book.)

- a. dem - Since the relative pronoun is the subject, the nominative is required, not dative. Please try again.
- b. das - The antecedent "Professor" is masculine, not neuter.
- c. den - Since the relative pronoun is the subject, the nominative is required, not accusative.
- d. der - (correct response)

10. Die Frau, ____ mir dieses Hemd geschenkt hat, ist meine Freundin Ute. (S)

(The woman who gave me this shirt is my girlfriend Ute.)

- a. der - The relative pronoun is the subject of the relative clause, and is therefore nominative.
- b. die - (correct response)
- c. dem - That is incorrect, for two reasons. First, the relative pronoun is the subject of the relative clause, and is therefore nominative. Second, the antecedent "Frau" is feminine.
- d. das - Your response is incorrect, for two reasons. First, the relative pronoun is the subject of the relative clause, and is therefore nominative. Second, "Frau" is feminine, not neuter.

11. Herr Young ist ein Mann, ____ immer pünktlich ist. (S)

(Mr. Young is a man who is always on time.)

- a. der - (correct response)
- b. denen - First, the relative pronoun is the subject, and therefore requires the nominative, not dative. Second, the antecedent "Mann" is singular, not plural.
- c. dem - The relative pronoun is the subject, and therefore requires the nominative, not dative.
- d. den - The relative pronoun is the subject, and therefore requires the nominative, not accusative.

APPENDIX H

12. Das Kind, ____ letzte Woche hier war, ist meine Nichte. **(S)**
 (The child who was here last week is my niece.)
- a. dem - The relative pronoun is the subject, and therefore requires the nominative, not dative.
 - b. der - The antecedent "Kind" is neuter, not masculine.
 - c. das - (correct response)
 - d. die - The antecedent "Kind" is neuter, not feminine.
13. Der Tisch, auf ____ die Teller stehen, ist wackelig. **(OP)**
 (The table, upon which the plates are set, is wobbly.)
- a. den - That would mean that the dishes climbed up onto the table by themselves! Since there is no motion, the verb "stehen + auf" requires the dative.
 - b. das - The antecedent "Tisch" is masculine, not neuter.
 - c. der - The verb "stehen + auf" requires the dative, not the nominative.
 - d. dem - (correct response)
14. Mein BMW ist ein Auto, ____ sehr teuer ist. **(S)**
 (My BMW is a car that is very expensive.)
- a. das - (correct response)
 - b. der - The antecedent "Auto" is neuter, not masculine.
 - c. den - First, the relative pronoun is the subject, and is therefore nominative, not accusative. Second, the antecedent "Auto" is neuter, not masculine.
 - d. dem - The relative pronoun is the subject, and is therefore nominative, not dative.
15. Das Mädchen, ____ ich gestern geküßt habe, ist Roberts Freundin. **(DO)**
 (The girl whom I kissed yesterday is Robert's girlfriend.)
- a. die - This one was tough. Although the antecedent "Mädchen" refers to a female, the -chen ending makes it neuter and not feminine.
 - b. der - The antecedent "Mädchen" ist neuter, not masculine.
 - c. das - (correct response)
 - d. dem - Since the relative pronoun is the direct object within the relative clause, the accusative is needed in this instance.

APPENDIX H

16. Die Stadt, aus ____ Jürgen kommt, heißt Dresden. **(OP)**
 (The city that Jürgen is from is called Dresden.)
- a. dem - Although you're correct that the preposition "aus" requires the dative, the antecedent "Stadt" is feminine.
 - b. der - (correct response)
 - c. die - The preposition "aus" requires the dative.
 - d. denen - Although you're correct that the preposition "aus" requires the dative, the antecedent "Stadt" is singular, not plural.
17. Der Junge, für ____ wir das Spielzeug gekauft haben, ist unser Sohn David. **(OP)**
 (The boy for whom we bought the toy is our son David.)
- a. der - The preposition "für" requires the accusative, not the nominative.
 - b. die - The antecedent "Junge", although it sports an -e ending, is masculine, not feminine.
 - c. den - (correct response)
 - d. dem - The preposition "für" requires the accusative, not the dative.
18. Die Leute, mit ____ wir ins Kino gegangen sind, waren nett. **(OP)**
 (The people with whom we went to the movies were very nice.)
- a. der - A good guess, and while you're correct that the preposition "mit" requires the dative, the antecedent "Leute" is plural, not feminine.
 - b. die - The preposition "mit" requires the dative.
 - c. dem - While you're correct that the preposition "mit" requires the dative, the antecedent "Leute" is plural, not masculine or neuter.
 - d. denen - (correct response)
19. Das ist die Frau, mit ____ ihr gestern gesprochen habt, oder? **(OP)**
 (That's the woman you spoke with yesterday, right?)
- a. der - (correct response)
 - b. denen - While it's true that "mit" is a preposition which requires dative, the antecedent "Frau" is feminine singular, not plural.
 - c. dem - Although you're right that "mit" is a preposition that requires dative, the antecedent "Frau" is feminine, not masculine or neuter.
 - d. die - "Mit" is a preposition that requires dative.

APPENDIX H

20. Die Frau, ____ ich Blumen mitgebracht habe, heißt Nancy. **(IO)**
 (The woman whom I brought flowers is Nancy.)
- a. die - Since the relative pronoun is the indirect object within the clause, the dative is required.
 - b. der - (correct response)
 - c. dem - Although you're correct that the relative pronoun requires the dative, the antecedent "Frau" is feminine, not masculine or neuter.
 - d. denen - While it's true that the relative pronoun requires the dative, the antecedent "Frau" is feminine singular, not plural.
21. Die Tante, bei ____ Katja als Kind gewohnt hat, kommt morgen zum Besuch. **(OP)**
 (The aunt with whom Katja lived as a child is coming for a visit.)
- a. dem - While you're correct that "bei" is a preposition that requires dative, the antecedent "Tante" is feminine, not masculine or neuter.
 - b. die - The preposition "bei" requires the dative case.
 - c. denen - Although it's true that "bei" is a preposition that requires dative, the antecedent "Tante" is feminine singular, not plural.
 - d. der - (correct response)
22. Ich habe dem Kind, ____ so nett war, eine Tafel Schokolade gekauft. **(S)**
 (I gave the child, who was so nice, a bar of chocolate.)
- a. der - The antecedent "Kind" is neuter, not masculine, regardless of the child's actual gender.
 - b. das - (correct response)
 - c. dem - Within the relative clause, the relative pronoun is the subject of the sentence, and therefore requires the nominative.
 - d. die - The antecedent "Kind" is neuter, not feminine, regardless of the child's actual gender.
23. Also seid ihr die Studenten, über ____ Susanne so oft spricht. **(OP)**
 (So you're the students Susanne talks about so often.)
- a. denen - Although you're correct that the antecedent "Studenten" is plural, the verb "sprechen + über" requires the accusative, not dative.
 - b. das - The antecedent "Studenten" is plural, not neuter singular.
 - c. die - (correct response)
 - d. der - The antecedent "Studenten" is plural, not masculine singular.

APPENDIX H

24. Schau mal! Da ist der Fernseher, ____ ich überall gesucht habe. **(DO)**
 (Look! There's the television I've been looking everywhere for.)
- a. den - (correct response)
 - b. das - The antecedent "Fernseher" is masculine, not neuter.
 - c. der - Since the relative pronoun is the direct object within the relative clause, the accusative is required, not the nominative.
 - d. dem - Since the relative pronoun is the direct object within the relative clause, the accusative is required, not the dative.
25. Torsten hat den Fußball verloren, ____ ich ihm geschenkt habe. **(DO)**
 (Torsten lost the football I gave him.)
- a. der - Since the relative pronoun is the direct object within the relative clause, the accusative is required, not the nominative.
 - b. das - The antecedent "Fußball" is masculine, not neuter.
 - c. den - (correct response)
 - d. dem - Since the relative pronoun is the direct object within the relative clause, the accusative is required, not the dative.
26. "Buddenbrooks" heißt das Buch, ____ ich letztes Semester gelesen habe. **(DO)**
 ("Buddenbrooks" is the name of the book I read last semester.)
- a. dem - Since the relative pronoun is the direct object, the accusative is required, not the dative.
 - b. der - First, the antecedent "Buch" is neuter, not masculine. Second, since the relative pronoun is the direct object, the accusative is required, not the nominative.
 - c. die - The antecedent "Buch" is neuter, not feminine.
 - d. das - (correct response)
27. "Kaspar Hauser" heißt der Film, von ____ wir so viel gehört haben. **(OP)**
 ("Kaspar Hauser" is the name of the film we've heard so much about.)
- a. dem - (correct response)
 - b. den - "Von" is a preposition that requires the dative, not accusative.
 - c. der - "Von" is a preposition that requires the dative, not nominative.
 - d. denen - Although you're right that "von" is a preposition that requires the dative, the antecedent "Film" is masculine singular, not plural.

APPENDIX H

28. Ohio State ist die Fußballmannschaft, gegen ____ wir am Samstag spielen.

(OP)

(Ohio State is the football team we're playing against on Saturday.)

- a. der - The preposition "gegen" requires the accusative, not the dative.
- b. die - (correct response)
- c. denen - First, the preposition "gegen" requires the accusative, not the dative. Second, the antecedent "Fußballmannschaft" is feminine singular, not plural.
- d. das - The antecedent "Fußballmannschaft" is feminine, not neuter.

29. Herr Schmidt ist der Professor, bei ____ Anna letzten Sommer gearbeitet hat.

(OP)

(Dr. Schmidt is the professor with whom Anna worked last summer.)

- a. der - The preposition "bei" requires the dative, not the nominative.
- b. denen - The antecedent "Professor" is masculine singular, not plural.
- c. dem - (correct response)
- d. den - The preposition "bei" requires the dative, not the accusative.

30. Erik ist der Student, ____ Relativsätze sehr leicht findet! **(S)**

(Erik is the student who finds relative clauses very easy!)

- a. den - No, that would mean that relative clauses find Erik to be easy! Since we want Erik to be the subject, the relative pronoun should be nominative.
- b. der - (correct response)
- c. die - No, the antecedent "Student" is masculine, not feminine.
- d. dem - Since the relative pronoun is the subject, the nominative is required, not dative.

APPENDIX I

APPENDIX I

Metalinguistic Feedback Second Treatment Session

Before the actual feedback, a random response generator gives the subject an indication that the response was incorrect, i.e. "I'm sorry, that is incorrect". After the metalinguistic feedback, the random generator gives the subject some indication to try again, i.e. "Please try again." If the response was correct, the computer provided a congratulatory message and asked the subject to proceed.

Key: **S**=Subject Clause, **DO**=Direct Object Clause, **IO**=Indirect Object Clause, **OP**=Object of a Preposition Clause.

1. Jazz ist die Musik, ____ ihm am besten gefällt. (**S**)
(Jazz is the kind of music he likes best.)
 - a. das - The antecedent "Musik" is feminine, not neuter.
 - b. dem - Since the relative pronoun is the subject, the nominative is required in this instance, not the dative.
 - c. die - (correct response)
 - d. der - Because the relative pronoun is the subject, the nominative is required, not the dative.
2. Anja ist die Frau, ____ ich liebe. (**DO**)
(Anja is the woman I love.)
 - a. die - (correct response)
 - b. der - Since the relative pronoun is the direct object, the accusative is required, not the dative.
 - c. das - The antecedent "Frau" is feminine, not neuter.
 - d. denen - First, the antecedent "Frau" is feminine singular, not plural. Second, since the relative pronoun is the direct object, the accusative is required, not the dative.
3. Georg ist der Freund, ____ ich immer mit den Hausaufgaben helfe. (**DO**)
(Georg is that friend of mine whom I'm always helping with his homework.)
 - a. den - "Helfen" is a verb which requires the dative, not the accusative.
 - b. der - "Helfen" is a verb which requires the dative, not nominative.
 - c. das - The antecedent "Freund" is masculine, not neuter.
 - d. dem - (correct response)

APPENDIX I

4. Jim Morrison ist ein Rocksänger, ____ an Drogen gestorben ist. **(S)**
(Jim Morrison is a rock star who died from drugs.)
- dem - Because the relative pronoun is the subject, the nominative is required, not the dative.
 - der - (correct response)
 - den - Since the relative pronoun is the subject, the nominative is needed in this instance, not the accusative.
 - das - The antecedent "Rocksänger" is masculine, not neuter.
5. Der Fernseher, ____ ich vor zwei Tagen gekauft habe, ist schon kaputt. **(DO)**
(The television I bought two days ago is already broken.)
- dem - As the relative clause is the direct object, we require the accusative here, not the dative.
 - die - The antecedent "Fernseher" is masculine, not feminine.
 - den - (correct response)
 - der - Since the relative clause is the direct object, the accusative is required, not the nominative.
6. Das Land, aus ____ er kommt, heißt Schweden. **(OP)**
(The country he comes from is called Sweden.)
- der - Although you're correct that the dative is required, the antecedent "Land" is neuter, not feminine.
 - das - The preposition "aus" requires the dative, not the accusative.
 - dem - (correct response)
 - denen - Although you're correct "aus" requires the dative, the antecedent "Land" is neuter singular, not plural.
7. Das Mädchen, ____ das grüne Kleid trägt, ist Bernhards Tochter. **(S)**
(The girl who is wearing the green dress is Bernhard's daughter.)
- die - Although it's easy to assume that "Mädchen" would be feminine, the suffix -chen makes any noun neuter.
 - dem - Since the relative pronoun is the subject, the nominative is required, not the dative.
 - der - The antecedent "Mädchen" is neuter, not masculine.
 - das - (correct response)

APPENDIX I

8. Ich habe den Film gesehen, von ____ Katja so oft spricht. **(OP)**
(I saw the film that Katja talks about so often.)
- a. dem - (correct response)
 - b. der - The preposition "von" requires the dative, not the nominative.
 - c. den - With the preposition "von", the dative is required, not the accusative.
 - d. das - The antecedent "Film" is masculine, not neuter.
9. Ich haben die Note in Deutsch bekommen, ____ ich verdient habe. **(DO)**
(I received the grade in German that I deserved.)
- a. die - (correct response)
 - b. denen - First, as the relative pronoun is the direct object, the accusative is required, not the dative. Second, the antecedent "Note" is feminine singular, not plural.
 - c. der - Since the relative pronoun is the direct object, the accusative is required, not the dative.
 - d. das - The antecedent "Note" is feminine, not neuter.
10. Das Mädchen, ____ du das Spielzeug gegeben hast, heißt Annemarie. **(IO)**
(The girl to whom you gave the toy is named Annemarie.)
- a. das - The relative pronoun, as the indirect object, requires the dative, not nominative or accusative.
 - b. dem - (correct response)
 - c. der - The antecedent "Mädchen" is neuter, not masculine.
 - d. den - First, the antecedent "Mädchen" is neuter, not masculine. Second, since the relative pronoun is the indirect object, the dative is needed, not the accusative.
11. Die Stadt, durch ____ wir gefahren sind, heißt Regensburg. **(OP)**
(The city we drove through is called Regensburg.)
- a. denen - First, the antecedent "Stadt" is feminine singular, not plural. Second, the preposition "durch" requires the accusative, not the dative.
 - b. der - The preposition "durch" needs the accusative, not the dative.
 - c. das - The antecedent "Stadt" is feminine, not neuter.
 - d. die - (correct response)

APPENDIX I

12. Frühling ist die Jahreszeit, in ____ die Vögel singen. **(OP)**
(Spring is the season in which the birds sing.)
- a. der -
 - b. die - Since the sentence indicates no motion within a fixed point in time, the relative pronoun requires the dative, not the accusative.
 - c. denen - Although you're correct that the dative is needed, the antecedent "Jahreszeit" is feminine singular, not plural.
 - d. das - The antecedent "Jahreszeit" is feminine, not neuter.
13. Der Junge, ____ mit Julia zur Schule geht, heißt David. **(S)**
(The boy who goes to school with Julia is named David.)
- a. den - The relative pronoun, as the subject, requires the nominative, not the accusative.
 - b. die - The antecedent "Junge" is masculine, not feminine.
 - c. der - (correct response)
 - d. dem - Since the relative pronoun is the subject, the nominative is required, not the dative.
14. Die Frau, mit ____ ich gestern im Restaurant war, ist meine Freundin. **(OP)**
(The woman with whom I was at the restaurant yesterday is my girlfriend.)
- a. denen - Although you're right that "mit" requires the dative, the antecedent "Frau" is feminine singular, not plural.
 - b. der - (correct response)
 - c. das - The antecedent "Frau" is feminine, not neuter.
 - d. dem - Although you're correct that "mit" requires the dative, the antecedent "Frau" is feminine, not masculine or neuter.
15. Dirk hat dem Jungen, ____ so brav war, eine Tafel Schokolade gegeben. **(S)**
(Dirk gave a bar of chocolate to the boy who was so well-behaved.)
- a. das - The antecedent "Junge" ist masculine, not neuter.
 - b. dem - The relative pronoun, as the subject, requires the nominative, not dative.
 - c. der - (correct response)
 - d. den - Since the relative pronoun is the subject, the nominative is required, not the accusative.

APPENDIX I

16. Die Frau, ____ wir den Pulli geschenkt haben, arbeitet in unserem Büro.

(IO)

(The woman to whom we gave the sweater works in our office.)

- a. die - Since the relative pronoun is the indirect object, the dative is required, not the nominative or accusative.
- b. denen - Although you're right that the dative is required, the antecedent "Frau" is feminine singular, not plural.
- c. dem - Although you're correct that the dative is required, the antecedent "Frau" is feminine, not masculine or neuter.
- d. der - (correct response)

17. Das ist der Mann, mit ____ ihr letzte Woche gesprochen habt. (OP)

(That's the man you (pl.) spoke with last week.)

- a. dem - (correct response)
- b. der - The preposition "mit" requires the dative, not the nominative.
- c. denen - Although you're right that "mit" requires the dative, the antecedent "Mann" is masculine singular, not plural.
- d. den - The preposition "mit" requires the dative, not the accusative.

18. Die Professorin, ____ mir eine 4.0 gegeben, ist jetzt leider krank. (S)

(The professor (f.) who gave me a 4.0 is unfortunately ill now.)

- a. die - (correct response)
- b. das - The antecedent "Professorin" is feminine, not neuter.
- c. den - The antecedent "Professorin" is feminine, not masculine.
- d. der - Since the relative pronoun is the subject, the nominative is required, not the dative.

19. Das Buch, von ____ ich so viel gehört habe, habe ich endlich gelesen.

(OP)

(I finally read the book that I had heard so much about.)

- a. das - The preposition "von" requires the dative, not the accusative.
- b. der - Although you're correct that "von" requires the dative, the antecedent "Buch" is neuter, not feminine.
- c. denen - Although you're right that "von" requires the dative, the antecedent "Buch" is neuter singular, not plural.
- d. dem - (correct response)

APPENDIX I

20. Der Stuhl, auf ____ Jürgen sitzt, ist blau. **(OP)**
 (The chair, upon which Jürgen is sitting, is blue.)
 a. den - Since there is no motion, the preposition "auf" requires the dative, not the accusative.
 b. denen - Although you're right that the dative is required, the antecedent "Stuhl" is masculine singular, not plural.
 c. dem - (correct response)
 d. das - The antecedent "Stuhl" is masculine, not neuter.
21. Der Stuhl, auf ____ ich mich hinsetze, ist grün. **(OP)**
 (The chair, upon which I seat myself, is green.)
 a. der - Since there is an indication of motion, the preposition "auf" requires the accusative, not the nominative.
 b. den - (correct response)
 c. dem - Considering that there is an indication of motion, the preposition "auf" requires the accusative, not the dative.
 d. die - The antecedent "Stuhl" is masculine, not feminine.
22. Die Stadt, in ____ der Eiffelturm steht, heißt Paris. **(OP)**
 (The city in which the Eiffel Tower is located is called Paris.)
 a. die - Since there is no motion, the preposition "in" requires the dative, not the accusative.
 b. dem - Although you're correct that the dative is required, the antecedent "Stadt" is feminine, not masculine or neuter.
 c. der - (correct response)
 d. denen - Although you're right that the dative is needed, the antecedent "Stadt" is feminine singular, not plural.
23. Ich habe das Theaterstück gesehen, über ____ Hannes geschrieben hat. **(OP)**
 (I saw the play that Hannes wrote about.)
 a. das - (correct response)
 b. die - The antecedent "Theaterstück" is neuter, not feminine.
 c. den - The antecedent "Theaterstück" is neuter, not masculine.
 d. dem - The verb "schreiben + über" (to write about) requires the accusative, not the dative.

APPENDIX I

24. Der Mann, bei ____ ich wohne, arbeitet als Lehrer. **(OP)**
 (I man I live with work as a teacher.)
 a. der - The preposition "bei" requires the dative, not the nominative.
 b. denen - Although you're correct that the dative is required, the antecedent "Mann" is masculine singular, not plural.
 c. den - The preposition "bei" requires the dative, not the accusative.
 d. dem - (correct response)
25. Es war meine Frau, für ____ ich das Auto gekauft habe. **(OP)**
 (It was my wife for whom I bought the car.)
 a. die - (correct response)
 b. den - The antecedent "Frau" is feminine, not masculine.
 c. der - The preposition "für" requires the accusative, not the dative.
 d. das - The antecedent "Frau" is feminine, not neuter.
26. Mein Bruder, ____ sehr reich ist, hat gestern einen BMW gekauft. **(S)**
 (My brother, who is very rich, bought a BMW yesterday.)
 a. den - The relative pronoun, as the subject, requires the nominative, not the accusative.
 b. der - (correct response)
 c. das - The antecedent "Bruder" is masculine, not neuter.
 d. dem - Since the relative pronoun is the subject, the nominative is required, not the dative.
27. Sonja hat den fremden Mann, ____ sie geküßt hat, ins Gesicht geschlagen. **(S)**
 (Sonja punched in the face the strange man who had kissed her.)
 a. das - The antecedent "Mann" is masculine, not neuter.
 b. die - The antecedent "Mann" is masculine, not feminine.
 c. der - (correct response)
 d. dem - Since the relative pronoun is the subject, the nominative is required, not the dative.
28. Er kauft den Computer, ____ am schnellsten ist. **(S)**
 (He will buy the computer that is fastest.)
 a. den - The relative pronoun, as the subject, requires the nominative, not the accusative.
 b. dem - Since the relative pronoun is the subject, the nominative is needed, not the dative.
 c. der - (correct response)
 d. das - The antecedent "Computer" is masculine, not neuter.

APPENDIX I

29. Das sind die Freunde, mit ____ ich in der Kneipe war. **(OP)**
(Those are the friends with whom I was in the bar.)
- a. der - Although you're correct that "mit" requires the dative, the antecedent "Freunde" is plural, not feminine singular.
 - b. dem - Although you're right that the dative is needed, "Freunde" is plural, not masculine or neuter singular.
 - c. die - The preposition "mit" requires the dative.
 - d. denen - (correct response)
30. Der Schauspieler, ____ sehr nervös war, hat nicht so gut gespielt. **(S)**
(The actor, who was very nervous, didn't perform so well.)
- a. die - The antecedent "Schauspieler" is masculine, not feminine. A female actor would be a "Schauspielerin".
 - b. der - (correct response)
 - c. dem - Since the relative pronoun is the subject, the nominative is required, not the dative.
 - d. den - The relative pronoun, as the subject, requires the nominative, not the accusative.

LIST OF REFERENCES

REFERENCES

Aarts, F., & Schils E. (1995). Relative clauses, the accessibility hierarchy, and the contrastive analysis hypothesis." IMAL, 33, 47-63.

Bradin, C. (1996). Guide to techno-babble for language teachers. Unpublished glossary.

Brandl, K. (1995). Strong and weak students' preferences for error feedback: Options and preferences. Modern Language Journal 79, 194-211.

Carroll, S., & Swain, M. (1993). Explicit and implicit negative feedback. An empirical study of the learning of linguistic generalizations. Studies in Second Language Acquisition, 15, 357-386.

Chapelle, C., & Jamieson, J. (1989). Research trends in CALL. In M. Pennington (Ed.), Teaching Languages with Computers: The State of the Art. Houston, TX: Athelstan.

Doughty, C. (1991). Second language instruction does make a difference: Evidence from an empirical study of SL relativization. Studies in Second Language Acquisition, 13, 431-469.

Fotos, S. (1993). Consciousness raising and noticing through focus on form: Grammar task performance versus formal instruction. Applied Linguistics, 14, 385-407.

Garrett, N. (1986). The problem with grammar: What kind can the language learner use? Modern Language Journal, 70, 133-49.

Garrett, N. (1991). Technology in the service of language learning: Trends and issues. Modern Language Journal, 75, 74-101.

Gass, S. (1979). Language transfer and universal grammar relations. Language Learning, 29, 327-344.

Gass, S. (1997). Input, interaction, and the second language learner. New Jersey: Lawrence Erlbaum.

Gass, S., & Selinker, L. (1994) Second language acquisition: An introductory course. New Jersey: Lawrence Erlbaum.

Hellinger, M. (1977). Kontrastive Grammatik: Deutsch-Englisch. Tübingen: Niemeyer.

Higgins, J. (1988). Language, learners, and computers. London: Longman Group UK Ltd.

Higgins, J., & Johns, T. (1984). Computers in language learning. Collins ELT/Addison-Wesley.

Keenan, E., & Comrie, B. (1977). Noun phrase accessibility and universal grammar. Linguistic Inquiry, 8, 63-99.

Kufner, H. (1962). The grammatical structures of English and German. Chicago: University of Chicago Press.

Kuo, T.-M., & Hirschman, E. (1997). The role of distinctive perceptual information in memory: Studies of the testing effect. Journal of Memory and Language, 36(2), 188-201.

Long, M.H. (1981). Input, interaction, and second language

acquisition. In H. Winitz (Ed.), Native language and foreign language acquisition: Annals of the New York Academy of Sciences, 379, 259-278.

Long, M.H. (1996). The role of the linguistic environment in second language acquisition. In W.C. Ritchie and T.K. Bhatia (Eds.), Handbook of language acquisition. Vol. 2: Second language acquisition. New York: Academic Press.

Long, M.H. (1997, February). SLA research and options in syllabus design. Workshop presented at the University of Pennsylvania.

Mackey, A., & Philp, J. (1998). Conversational interaction and second language development: Recasts, responses, and red herrings? Modern Language Journal, 82(3).

Meredith, R.A. (1978). Improved oral test scores through delayed response. Modern Language Journal, 62, 321-327.

Nagata, N., & Swisher, M.V. (1995). A study of consciousness-raising by computer: The effect of metalinguistic feedback on second language learning. Foreign Language Annals, 28, 337-47.

Pennington, M. (1996). The power of the computer in language education. In M. Pennington (Ed.), The power of CALL (pp. 1-13). Houston, TX: Athelstan.

Robinson, G. (1990). Effective feedback strategies in CALL. In P. Dunkel (Ed.), Computer-assisted language learning and testing: Research issues and practice (pp. 155-167). New York: Newbury

House.

Robinson, P. (1995). Attention, memory and the 'noticing' hypothesis. Language Learning, 45, 283-322.

Schachter, J. (1983). A new account of language transfer. In S. Gass & L. Selinker (Eds.), Language transfer in language learning (pp. 98-111). Rowley, MA: Newbury House.

Schmidt, R. (1993). Awareness and second language acquisition. Annual Review of Applied Linguistics, 13, 206-226.

Sharwood Smith, M. (1991). Speaking to many minds: On the relevance of different types of language information for the L2 learner. Second Language Research, 7, 118-132.

Stevens, Vance. (1989a). A direction for CALL: From behavioristic to humanistic courseware. In M. Pennington (Ed.), Teaching Languages with Computers: The State of the Art. Houston, TX: Athelstan.

Stevens, Vance. (1989b). Student attitudes toward CALL in a self-access centre. CALL Digest, 5, 4-5.

Tomlin, R.S., & Villa, V. (1994). Attention in cognitive science and second language acquisition. SSLA, 16, 183-203.

Van der Linden, E. (1993). Does feedback enhance computer-assisted language learning? Computers in Education, 21, 61-65.

VanPatten, B., & Cadierno, T. (1993). Explicit instruction and input processing. Studies in second language acquisition, 15, 225-243.

Warschauer, M. (1997). Computer-assisted language learning: An introduction. In S. Fotos (Ed.), Multimedia Language Teaching (pp. 3-20). Tokyo: Logos International.

Zorach, C., & Melin, C. (1994). English grammar for students of German (3rd ed.). USA: Olivia Hill Press.