

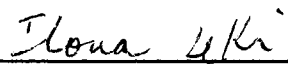
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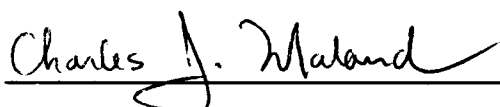
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THE COMPUTER-ASSISTED REVISION STRATEGIES OF SIX
NON-NATIVE FRESHMAN WRITERS: A COMPARATIVE
ANALYSIS FROM PUBLISHED ACCOUNTS OF NATIVE WRITERS

A Thesis
Presented for the
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Regina Dragoin
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ABSTRACT

The purpose of this experimental study is to determine what revision strategies are employed by ESL students as they compose and revise their papers on word processors, and to determine if these strategies are similar to or different from the strategies employed by native writers. Several criteria were used to judge the between-draft revisions: the changes were analyzed by type of change (meaning-preserving or meaning-altering); level of change (from surface to multiple sentence level); operation (addition, deletion, substitution, permutation, distribution, and consolidation); and the effectiveness of the change toward producing a solid final draft.

Thirty drafts written by six advanced ESL students enrolled in English 131 at the University of Tennessee in Spring 1989 were studied. Analysis of 1,328 revisions and a comparison of the results of this study with the results of published studies done on native writers indicated that revealed that these ESL writers revise much like their native-speaking peers. Like Bridwell's writers (1980), the ESL writers made nearly 55% of their revisions at the surface and word level; they did however, make more surface changes than the native writers. This study found no correlation between the stage at which a writer makes a revision and the quality of the final product. There may be a correlation, however, between certain composing behaviors and the writer's skill. As Faigley and Witte (1981) observed of their writers, the less-skilled writers in this study were preoccupied with local concerns in their texts from the outset; the more advanced writers initially worked on meaning in their papers and turned to editing near the end of the process. The majority of the changes made by students in this study were in additions to their texts, which Sommers (1980) suggests is the operation used most by skilled writers.

The findings of this study indicate that in many instances the revising strategies of advanced ESL students who work on computers do not differ

significantly from the strategies of native writers. These findings of this pilot study also have several important implications for further research in the field of ESL composition. The difficulties presented in this kind of research are explored.

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CHAPTER I

INTRODUCTION

Since the University of Tennessee at Knoxville recently began offering computer-aided composition classes to its English as Second Language (ESL) students, a good opportunity now exists to study the computer-aided writing processes of ESL students. Computer-aided composition in ESL studies is a relatively new field, and there is room for important, innovative research in this area.

To consider the writing process as a whole, from invention of ideas to final paper production, would risk not being thoroughly and intensively focused in a study such as this one. Therefore, this research project focuses on only one area of the overall composing process: revision. While Vivian Zamel (1982) points out that the composing process "involves not only the act of writing itself but prewriting and rewriting, all of which are interdependent" (196), she also notes we have to do more research in all areas of the composing process. Thus, it may seem inappropriate to extract one aspect of the composing process, since they are interdependent, and to consider it separately from that process. However, enough studies have been devoted to revision exclusively (most notably Faigley and Witte, 1981; Bridwell, 1980; Sommers, 1980) to indicate that such research is viable and useful. Indeed, entire books have recently treated revision alone (Sudol, 1982; Lanham, 1979). The first chapter of this thesis will provide an overview of the research conducted on revision and on the revision strategies of ESL students.

Less research to date has been concerned with computer-aided revision strategies, though work in this field is increasing rapidly. The findings are interesting and occasionally conflicting. Because the word processor makes any text easier to change, it invites the writer to make changes in the text. The

laborious task of recopying or retyping an altered manuscript is eliminated by the word processor, so writers are, in theory, more likely to revise. The controversy enters when one analyzes the meaningfulness or appropriateness of these changes. In 1983, Bean found word processors to have "significant positive impacts on revising habits" (148) in terms of more text-base changes and more revisions in general. However, Hawisher (1987), observing students composing on word processors, noted that there is "no positive relationship between extensive revision and the quality ratings [of student papers]," which, she suggests, may only be an indication that revision itself means little to students. Bridwell, Sirc, and Brooke (1985) simply concluded that word processors allow for "*extension* of revision strategies already present in the traditional processes of our students" (191), and that to "attribute quick value judgments to a gain in revision changes per se is a superficial interpretation. We do not know yet what all our numbers mean" (193).

However, how word processors affect students' writing may reflect the writers' actual skills, in both writing and working with computers. Some researchers have found significant improvement in the work of basic writers who compose on computers (Hull, 1984; Arkik and Gallagher, 1984; Hunter, 1983). Indeed, basic writers, in one study, made more focused and sequential revisions and internalized the process of revising more quickly and completely than basic writers working with pen and paper (Rodrigues, 1985). Daiute (1986) observed that basic writers made more word and sentence-level error corrections and they wrote longer papers when they worked on word processors. That basic writers apparently benefit a good deal from computer-aided composition is significant because ESL writers, at least unskilled ones, have many of the same difficulties in composing and revising that basic writers have (Shaughnessy, 1977; Zamel, 1982). Zamel (1984) notes that "like inexperienced or basic native language writers. . . [unskilled ESL writers] have a very limited and limiting notion of what composition

involves" (198-99). This is not to say that their difficulties and habits are the same, nor are they rooted in the same problems, but these problems are similar enough to warrant consideration.

It would seem, then, that since basic writers benefit from composing on computers, the ESL students will also benefit, but this has not been verified in research to date. Studies have been conducted to determine what ESL writers do when they revise, but these conclusions, too, are conflicting. Zamel's students (1982) voluntarily worked through multiple drafts, making meaning-altering changes in the earlier drafts and concentrating on changes oriented to sentence structure, vocabulary, tense, punctuation, and inflection as they neared the final product. But in 1984 Heuring noted that unskilled ESL students simply do not revise efficiently: they tend to concentrate on local (as opposed to global) concerns in their texts.

Very little is known about how ESL students revise their work when composing on a word processor. A recent ERIC search in the Hodges Library at the University of Tennessee, Knoxville, did not produce a single article devoted to the computer-aided revision strategies of ESL students (out of over 5,000 articles on computer-aided composition in general). Clearly, then, research on this subject can make a significant contribution to the field.

The purpose of this study is to determine how the computer-aided revision strategies employed by ESL students differ from those employed by their native-speaking counterparts. This investigation will 1) employ a viable classification scheme for identifying the textual changes made by the ESL students; 2) apply this scheme to the ESL students' texts; 3) analyze the types of changes the ESL students are making in their papers and when they are making them; 4) determine the relationship between the changes made and the quality of the students' work; and finally, 5) compare these findings with the findings of similar, already published, research done on native writers' revision.

Four questions will guide the research:

1. What types of changes do ESL students make in their drafts as they work toward producing a final, polished paper?
2. How effective, in terms of quality of work, are these changes?
3. What influence, if any, does the stage of composing at which they make the change have on the quality of their work? That is, are there difference between the types of changes made in earlier and later drafts?
4. How do these changes differ from the changes made by native-speaking students?

The ESL writers involved in this study are six students from an English 131 class at UTK. This study looks at the revision strategies of two men and four women (two from the People's Republic of China, two Malaysian, one Korean, one Japanese) who composed their papers on the Microsoft Word program on Macintosh SE computers. Two papers, including the final versions as well as the rough drafts of each paper (three in the first assignment; two in the second), from each of the six students are analyzed. These students are advanced speakers of English and are fairly advanced in their writing abilities. They range from freshmen to graduate students.

The taxonomy proposed by Faigley and Witte (1981) is used to analyze the revision changes. In this scheme, the effects of the revisions on the text's *meaning* are considered, not simply changes in length. In earlier studies done on revision, the length of the T-units in a student's paper determined the relative sophistication of the text, but as Boiarsky (1988) points out, "any study of revision...needs to evaluate the changes made in relationship to the need for the change." Each draft is analyzed--in sequence--according to the surface and meaning-altering changes made and, again, according to how they affect the text's meaning and quality. A modified version of Lillian Bridwell's Revision Classification Scheme (1980) is employed to monitor the

levels at which the changes were made and the length of those changes. Her scheme does not consider changes in meaning. Jurisoft's CompareRite program is used to record the changes made from draft to draft.

Many composition instructors look to published studies to improve their teaching. However, these studies most often involve native-speakers. If ESL students do in fact revise differently from their native-speaking counterparts, instructors will want to approach these studies with the understanding that the pedagogical and theoretical implications may only apply to native composition programs. Then again, if the strategies of ESL students (at a certain level) reflect those of native writers, the advantage to ESL research and instruction is apparent; much of the work that has been done in native composition could be applied to work in ESL composition and instruction. Also, because so little research has been done in the area of computer-aided revision strategies of ESL students, this study will be useful to other researchers by offering them direction in their own studies.

CHAPTER II

REVIEW OF REVISION THEORY

Modern composition theory regards writing as a process involving prewriting, writing, and rewriting a text; one has not begun to write something until he or she has begun to rewrite it. Though now one of the cornerstones of composition theory, the idea that revising a text is an inherent part of creating one was not closely considered or understood until just recently: in the last twenty years of a field that reaches back a millennia.

The present understanding of how writers revise is influenced by past conceptions and how these conceptions have evolved into what they are now--and how they are continuing to evolve. So our review of revision theory must begin with the past conceptions, with the rhetoricians of the ancient world.

HISTORY

The Greeks and Romans laid the foundations of much of the theory of rhetoric; however, revision, a re-seeing of a text for the purposes of improving it or for changing the direction of the message either totally or partially, was not part of the earlier rhetoricians' understanding of how a writer produced text. Aristotle, whose interest in the composing process as such (he was an orator, not a writer) was in invention, did not leave provisions for altering a spoken text at any level beyond the words and sentences, cosmetic changes rather than substantial changes in meaning. Medieval rhetoricians, including Saint Augustine, continued this Aristotelian approach by emphasizing a writer's product. Medieval students learned the arts of rhetoric by imitating the styles of earlier successful rhetoricians so the only "revisions" they made in their texts were aimed at sounding more like their model. They altered the surface of their text extensively without altering the text's meaning or structure.

The voice of dissent among the early philosophers and teachers came from Quintillian, who advocated more flexibility in writing. He suggested that the three ways to change a text are by adding to it, taking away from it, and altering it. In this view, he left room for error and encouraged a writer to change a text considerably. Since even Quintillian was preoccupied with the correctness of the final text, many of his additions, deletions, and alterations are devoted to editing and polishing the writer's final product. Renaissance rhetoricians, notably Erasmus, resembled Quintillian in their approach to the study of rhetoric more than their medieval predecessors: they moved away from the copious imitation of other writers to learn writing, but, again, attributed the quality of a text in large part to its correctness.

The 18th and 19th centuries were marked by a rising interest in invention, a rising that resulted in the Romantic movement which stressed individuality in writing and creating. Eighteenth-century rhetoricians like Bacon and Johnson reacted to the earlier preoccupation with exactness in style which gave their 19th-century counterparts Blair, Campbell, and Whately leeway to suggest different approaches to, and varying methods of, discourse production. But constant and recursive revision of one's material was not one of the varying methods discussed.

However, early preoccupations with the mechanical perfection of a writer's work (or with editing) and the fact that "revision" is never discussed should not suggest that these writers did not revise (alter their texts' structure and meaning for purposes of improving it). In "A History of Revision: Theory vs. Practice" (1982), Karen Hodges identifies three strands of rhetorical thought that influenced earlier writers: the Classical school (Aristotleian) which stresses invention in the composing process; the Neoclassical school which equates correctness--grammar, syntax, diction--with good writing; and the Romantic school which stresses individuality in writing, rebelling against patterns and standards deemed acceptable by earlier rhetoricians. The emergence of the Romantic school marks the beginning of revision, in a

modern sense of the word, as an acceptable part of writing. Hodges reviews the "revision theories" (influenced by Neoclassists) of the earlier writers and compares them to the actual revision practices of some of those writers. She looks at works of Renaissance writers Sidney, Drayton, and Milton (among others), writers who insisted that they composed final drafts on the first try, and she finds that these writers were, in fact, all copious revisers. Each left written drafts of their final works; some even revised their works after they were published. The implications are, then, that the actual practices of even earlier writers probably differed from their professed practices. Further implications are that those writers who did not make multiple written drafts no doubt revised in the heads, changing words and considering the structure of their work, before committing their thoughts to paper. To these earlier writers, however, revision meant what it still seems to mean to unskilled writers today: editing. Having to revise a text implied that errors had been made in the work. It has only been in the past twenty years or so that we have begun to approach revision as a process separate from editing and have begun to develop a more global view of revising. It is less a correction of error than an overall improvement of a text. Modern revision theory understands revision as a process which begins the moment an idea for writing is conceived and continues until the writer stops work on the text.

THE MOVE FROM PRODUCT TO PROCESS: REVISION EMERGING

In 1968 the Pulitzer Prize winning journalist Donald Murray published A Writer Teaches Writing. Our review of modern revision theory begins here.

Starting with Murray is not to suggest that revision is at long last considered as a part of the composing process, but that rhetoricians finally began to see writing as a process where earlier scholars only saw it as the final product, the finished work. This shift, theoretical and pedagogical, from considering only the final results of a writer's effort, the product, to observing and directing the means by which the writer produces the text, the process, is

a recent and important development in the study of composition. This shift allows us to separate revising (the process re-visioned; the message) from editing (the product corrected; the language). Murray calls revision rewriting and thus asserts that revision is one step in the process, a particular, distinct, separate process, to be done after one has actually written something, a first draft or part of a first draft. He suggests that after the writer "has that draft completed he can become an *editor*" (italics mine, 11). By relegating revision to one step which involves an editor reviewing a written draft, Murray is in keeping with the composition theories of the late 1960's: he presents the writing process in a linear paradigm and revising as the work of an editor.

The editor works, according to Murray, by checking the overall structure of the paper, then checking the paragraphs, then the sentences, the phrases, and finally the individual words (11-12). Murray envisions this method as basically one of substitution and reduction and rearrangement, not as a process of reconsidering the audience and the writer's rhetorical situation. He does mention a "back and forth" approach to writing, which approaches an understanding of writing as a recursive activity, but he only uses it in the context of E.M. Forster's "How can I know what I think until I see what I say?" That is, writers observe the idea as it appears written down, and revise it according to their intentions. Murray suggests that,

This is the great circle of craft in which the writer is involved. He is searching for words and for meaning. He works back and forth, seeking a subject, an audience, raw materials, a design: he writes, rethinks, researches, redesigns, rewrites, searching for a meaning and for a way to communicate his meaning to other people. The professional writer rewrites and rewrites and rewrites. (12)

Which is almost understanding writing as revision, but Murray still defines revision as something begun when the first draft is complete. As noted later, revising is now conceived of as a process which necessarily occurs

recursively throughout every aspect of the composing process, not as a stage in a linear sequence.

Ken Macrorie (Telling Writing, 1970) follows Murray by limiting his discussion of revision to only small sections of his book: "Tightening," a section devoted to exercises in subordinating sentences, and "Sharpening," which presents revision as a matter of editing a completed text for accuracy and brevity by eliminating the excessive use of the verb "to be" in all its forms and all unnecessary adjectives, adverbs, and passive constructions. Here again, revision is approached as a step or stage in a linear paradigm, a means of correcting a text (editing) instead of a means of creating one.

In 1971 Janet Emig revolutionized research on the composing process and began to change our understanding of that process itself. She was the first contemporary researcher to suggest that composing is recursive in nature. In The Composing Process of Twelfth Graders, Emig derives a comprehensive outline of ten dimensions of the composing process by analyzing case studies of 16 and 17-year-olds. The major categories Emig gives are *the nature of stimulus, prewriting, planning, starting, composing aloud, reformulation, stopping, contemplation of product, and apparent teacher influence* on the work. This work is the first of its kind--a case study--but it is also one of the first in which the researcher considers and observes writing as a process and not just as the final written product. Emig identifies two kinds of writing: *extensive*, school-sponsored writing which students do not voluntarily revise, and *reflexive*, self-sponsored writing which students revise more readily. She also separates the "reformulation" of a written text into three areas according to the size of the task involved: *correcting, revising, and rewriting*. Correcting is a "small, and usually trivial, affair" that consists correcting surface errors. Revising, "a larger task," involves the "reformulation of larger segments of discourse." Rewriting, the largest of the three, often involves the "total reformulation of a piece in all its aspects"; it can even mean starting over (43). Thus Emig has differentiated between ~~editing~~ and revising and even between

different levels of revision. Although her research methods were innovative, they were also limited: ultimately, she observes the complete composing process of only one 12th grader. In order to reach an overall understanding of how writers compose, the studied population must be large enough from which to infer patterns and generalities.

Peter Elbow's Writing Without Teachers (1973) reads more like the textbooks before Emig's study than like a book which incorporated the results of her research. He is more interested in how writers begin writing, and less with how they go about changing his writing; Elbow gave us *freewriting*. He approaches an understanding of revision in terms of multiple drafts and of the "back and forth" method much like the one Murray discussed (revising the text as one goes along) by mentioning the "editor. . . constantly looking over the shoulder of the producer and constantly fiddling with what he's doing while he's in the middle of trying to do it" (5). He regards the back and forth revision as inhibitory--something to be "reined in." Freewriting is the "non-editing" method of writing in which one writes very quickly, making the pen an extension of the thought, without ever looking back to correct or change the text. This is a way of keeping our automatic and hypercritical editor out of the way long enough to get thoughts down on paper. Elbow is at times more in keeping with "modern" revision theory because he incorporates multiple drafts, thinking out loud, and an awareness that a monitor in the mind is always present even during the preliminary stages of writing. It is also significant that he considers writing as a process, rather than just a product. Elbow is in many ways innovative, but he does not follow through on the ideas he has. In some ways he is discussing revision, but sometimes he, too, is only discussing editing. He, too, consigns this process of revising to the final step of the composing process by suggesting that writers must have something written down before they can begin to revise. In the 1960's and early 1970's interest in *how* writers write increased significantly. Writers like Murray, Moffett, Macrorie, and Elbow reacted to the restrictive, stylized formulas for

writing that schools were (and in some cases still are) teaching, mostly influenced by the neoclassical notion that equates correctness with quality and stresses the different aims of discourse (expressive, referential, literary, persuasive). Following the ideas of the Romantics, these writers encouraged students to discover a way that works best for them, and they begin reviewing writing as a process. However, they had not yet come to the understanding that writing apparently is rewriting and rethinking, from the moment the idea to be written is conceived. Their definitions seem to be more in keeping with the suggestions of E.B. Strunk, whose methods for cut-throat editing (deleting and substituting mostly) are what passed as revising for years. Indeed, Nancy Sommers (1980) later shows these to be the methods employed by inexperienced, unskilled writers. But, as noted before, composition theory made a tremendous move forward when researchers and teachers turned their attention from the written product to the writing process; this advancement continued in the 1970's as editing became distinct from revising and as new research strategies were developed to untangle the complexities of the revision process itself. Nevertheless, early studies in the composing and revising processes were not as effective as they might have been because the research populations were too small to provide any conclusive results; in fact, as in the cases of Murray and Elbow, the "researcher" was generally making observations by investigating only his own composing process. Even though her study is also small, Emig's work stimulated the move from personal, non-scientific discussion to a more systematic and scientific case study approach. This move, too, is partly responsible for aiding researchers in redefining revision.

FROM PROCESS TO SUBPROCESS: REDEFINING REVISION

In the late 1970's researchers began to redefine their own researching strategies and goals, which naturally led to a redefining of the subject being researched. One of the major studies that laid the groundwork for this change

was Mina Shaughnessy's *Errors and Expectations* (1977). Even though Shaughnessy did not take a case study approach in observing her basic writers, she did look beyond her (and others) own preconceptions to consider closely the process used by her students. Her book is filled with copious examples and detailed explanations of what these examples reveal about the composing processes of basic writers. This book does not discuss revision theories *per se* (it is devoted mostly to discovering, interpreting, and correcting the problems basic writers have with writing), but it did play a part in changing the definition of revision by changing ideas about the composing process itself. Basic writers have difficulty in generating a primary text and so many of their "revision strategies" are aimed at producing a correct text. Shaughnessy notes that basic writers are egocentric in that they are unable to detach themselves from their work to see that a reader may not be able to understand them: they have a poor conception of audience (240). Shaughnessy also notes that while experienced writers generally have a period of "incubation" or mental revising which occurs before the writing actually begins (the experienced writers mull over and revise their work in their mind before setting it to paper), basic writers begin writing before this period of incubation is complete. Thus, their paper becomes a record of an "idea developing rather than a developed idea" (234). Also, unskilled writers do not naturally review their writing; they must be required to read back over anything they have written (277). Shaughnessy's work does contribute to our understanding of revision—perhaps the practice of it more than the theory behind it. Indeed, she set the stage for later developments in revision theory by identifying the problems basic writers have with composing and revising. Her observations contribute to our understanding of revising (for instance, the period of incubation is now considered part of the revising process), but despite her new ideas, her terminology is still colored by the conceptions of previous rhetoricians.

In 1978 Donald Murray reconsidered and redefined his earlier understanding of revision. He suggests that "writing is rewriting" and offers a new, though still linear, paradigm for the composing process: "*prevision, vision, and revision.*" He suggests that rewriting early drafts enables writers to discover and shape their meaning, and he identifies two kinds of rewriting: In *Internal revision* the writers themselves are the audience for whom the paper is written, and the writers go through the process of discovery and shaping meaning. Writers spend more time revising internally. In the second level of rewriting, *External revision*, the writers become an objective audience; they try to separate themselves from their texts. In external revising the writers are proofreading their texts, editing their errors, and comparing the results with the intended audience and message. The process of back and forth then lends itself to a process of moving in close on the text then pulling away to regard it more objectively. Murray identifies four aspects of discovery in internal revision (50):

1. *Content* draws on information, memories and so forth. A writer must have something to write about.

2. *Form and Structure*: "form is meaning." As writers move toward putting their content in order, they move toward meaning.

3. *Language* leads writers to meaning: switching and choosing words and word orders alter meaning.

4. *Voice*: writers hear what they have written. They achieve distance from the text as they listen to it.

Also in 1978 Barbara Hansen published an article in response to all those instructors who have taken the new, suddenly fashionable approach to teaching that "writing is rewriting" and are having their students write multiple drafts of every assignment before turning in a final version: to this she responds that "The act of revising and rewriting does not in itself result in improved composition skills" (956). In order to support this assertion, Hansen set up a study in which she took two of her own classes and had one

class, the experiment group, rewrite four of the eight writing assignments she gave to both classes. To this group she taught, over a period of eight days, revision as a process of editing and improving the essay's thesis, examples, paragraph and sentence structures, and proofreading. The control class was asked to make correction sheets for errors at the surface level, but not to rewrite their papers. The corrections, once completed, were filed by Hansen without further comment. By the end of the term, the students in both classes were showing about the same rate of improvement in their writing. The general essays and the end of the term essay were marked by four different evaluators, not Hansen herself. She tabulated the scores and compared the work of the two classes. Hansen concludes that doing a correction sheet is as valuable in improving student's compositional skills as having them do a complete revision of their papers. In fact, Hansen suggests that having students rewrite their papers will have

no significant value in improving a student's compositional skills; therefore, if students discuss revision techniques and perceive their writing problems, they will not need to make a revision, nor do a rewrite. If comprehension of revision techniques is achieved, the actual writing out of what has been comprehended may be irrelevant. (959)

Hansen's study, though carefully controlled, is of course a small, hence limited, one, and may be challenged on these grounds. However, her results are corroborated by studies that indicate, like Perl's, that students do not understand the process of revision and, until they are able to locate their mistakes and know what corrections to make (in terms of both broader rhetorical concerns as well as local errors), rewriting a paper is not likely to improve their writing skills.

While Hansen was dispelling the misconceptions many instructors had about revision and the part it plays in the classroom, Ellen Nold was working on a theory of revising by suggesting directions in research that might be

taken ("Revising: Toward a Theory," 1979). She suggests that research that "purports to judge communicative sophistication from the revising behaviors of students must control for at least three variables: (1) the subjective difficulty of the text, (2) the student's ability to generate alternative wordings, spellings, and the like and (3) the student's preferred strategies of composing" (1). She suggests that studies of revision should not isolate revision from the other aspects of the composing process because revision is not a subprocess of writing as planning, transcribing, and reviewing are. Revision, according to Nold, is the "retranscribing of the text already produced after a portion of the already existing text is reviewed and found wanting" (2). If the text is unacceptable and the writer is capable of producing a more acceptable text, then the writer will; but if the writer is unable to produce a better text, or if the writer finds the paper acceptable, he or she will not change it. Nold suggests that a text is reviewed against four criteria: (1) the intended effect, (2) the intended meaning, (3) the intended audience, and (4) the intended persona of the writer. Finally, Nold identifies four incorrect assumptions about revision which have remained useful in aiding researchers to develop a theory of revision (4):

- (1) Revision is a one-time process that occurs at the end of a writing session,
- (2) Difficulty of task makes no difference in the appearance of writing behavior,
- (3) Evidence from the text is the only data needed in analyzing revising behaviors, and
- (4) Reporting raw numbers of revision is useful.

While discovering new methods of research, and reconsidering the old methods, researchers also began to take a second look at the process of revising itself, not only in terms of **whether** revising works, but whether or not it works as well as was thought. Revision, it was discovered, does not always

improve a student's paper. It can, as Hansen demonstrated, have no effect at all on students' performances if they cannot identify what needs correcting, or, as Sondra Perl observed in her "Composing Processes of Unskilled Writers" (1979), it can actually make the paper worse. She noted that her students were concerned with lexicon, syntax, and the discourse as a whole but that their concern did not help them to produce error-free papers. Errors of all kinds were still present in the final drafts; Perl suggests that these errors may have been the result of rule confusion on the part of the students, or that they missed some of their errors as a result of selective perception, or that they perhaps are simply too egocentric as writers to be aware of audience needs that are different from their own. The point is that these students simply do not know how to revise, and their attempts to do so can make their papers worse. Students primarily view revision as an exercise in error hunting, and this process of editing interferes with the students' writing process because they begin looking for errors even before there is anything to edit. "What they seem to lack as much as any rule is a conception of editing that includes flexibility, suspended judgment, the weighing of possibilities, and the rewording of ideas" (333). That the students lack understanding of how to go about revision, however, does not mean that they do not have a system for revision. They do not compose at random; they have internalized processes that they consistently follow. But Perl also links this internalized process with the students' lack of writing proficiency which may be "attributable to the way in which premature and rigid attempts to correct and edit their work truncate the flow of composing without substantially improving the form of what they have written" (328). Perl also observes that the writing process itself is recursive or is done by "retrospective structuring"; that is, writing involves a frequently repeated sequence of planning, writing, clarifying, and discarding. As revision research becomes more specific by focusing on the subprocess of revising, as Perl has done in this definition of retrospective structuring, researchers begin to look for relationships not only between composing and revising, but

between the subprocesses themselves. This new approach, of course, greatly affects the revision paradigms. In later studies researchers not only devote entire articles to revision alone, but spend a great deal of effort considering its individual aspects.

FROM WRITING PROCESS TO MENTAL PROCESS: THE COGNITIVE APPROACH

At the turn of the decade, researchers took another step in developing a more scientific approach to the study of the composing process and revision: the cognitive approach is primarily concerned with the mental processes or faculties by which a writer produces text. By focusing on the cognitive functions involved in particular aspects of the writing process, researchers like Linda Flower and John Hayes (following) have developed a cognitive model for what goes on in the minds of writers as they compose.

In "Writer-Based Prose: A Cognitive Basis for Problems in Writing," Linda Flower takes a closer look at writer-based prose on the premise that it must be understood because, even if it is not an acceptable product in many situations, it is an apparently viable part of the composing process. It functions as a "medium for thinking," a means for a writer to order stored information into meaningful (for the reader) discourse. writer-based prose is generally the sort of work unskilled writers produce; it is work that is "inadequately structured" for a reader, and is often the prose that writing instructors find themselves correcting. Flower suggests that the logic underlying writer-based prose rests on three principles: "its underlying force is egocentric, and it uses either a narrative framework or survey to order ideas" (25). If these problems are indicated to students, they are generally able to manipulate their text into reader-based prose, either by putting down the information that is already available in their head but not available to the reader (this corrects egocentricity in the text), or by moving from a narrative or survey text to a more autonomous one, one that does not need the writer's context to be understood

by a reader. Helping students move from writer to reader-based prose requires focusing on revision and editing skills. Flowers' study has the added advantage of helping students and teachers find real material to work on, specific problems in the text that can be identified. Once a student has been shown a specific problem in the text, he or she will have a much easier time correcting it. As Perl pointed out, poor writers often have no idea how to approach a revision of their work; they simply cannot see the local errors and even broader concerns involved.

In "A Cognitive Process Theory of Writing" (1981), Flower and Hayes use protocols gathered over a period of five years to determine structures of the composing process which they conclude to be "hierarchically organized with component processes embedded within other components" and recursive. They identify three elements of the composing process: the task environment (everything that is happening outside the writer, from the rhetorical problem to the emerging text), a writer's long term memory (the writer's stored knowledge of the audience, topic, and plans for writing), and the writing process itself. The writing process is comprised of

the planning stage which is subdivided into *generating* (the act of building on an "internal representation" of the knowledge the writer will use), *organizing* (which helps the writer to make meaning), and *goal setting* (the goals which a writer sets are both "procedural and substantive" in the composing process),

the translating stage in which thoughts are put into words, and

the reviewing stage which is subdivided into evaluating and revising. The reviewing stage interests us most. Flower and Hayes suggest that reviewing may be (similar to Nold's definition of revision) "a conscious process in which writers choose to read what they have written as a springboard to further translating or with an eye to systematically evaluating and/or revising the text" (367). These periods may either be planned or unplanned and often lead to other periods of reviewing. This process and its subprocesses may interrupt

any other process at any time during the writing process. The whole composing process itself is regulated by a monitor which switches the mind from one stage to another recursively. These stages in Flower and Hayes' cognitive process model are, again, not linear or sequential. Poor writers, it is suggested, lack some of these abilities.

In another article, "The Cognition of Discovery: Defining a Rhetorical Problem" (1981), Flower and Hayes focus on how different writers interpret the rhetorical problems as they begin to work and how their interpretations affect their composing process. Good writers find more to work with in the rhetorical situations presented to them than do poor writers. Flower and Hayes suggest that this is because "the writers themselves create the problems they solve" (93). Poor writers then, do not recognize affecting the audience, creating a persona or voice, building a meaning, or producing a formal text as "problems" and thus do not try to solve or revise them. However, solving these problems, problems which skilled writers in essence creates for themselves, is the goal of skilled writers. Similar to Hansen's and Perl's earlier studies, Flower and Hayes point out that writers who do not perceive the problems of audience and so forth cannot even know when there are problems, rhetorical or otherwise, in their papers and thus will not or can not correct them.

Flower and Hayes *et al.* focus on revision alone in a more recent article, "Detection, Diagnosis, and the Strategies of Revision" (1986). They look at the causes of revision and attempt to come up with "a more explicit description of the thinking process this act requires" (17). Since writers will only revise a text when they think the text needs to be improved, the question becomes how does a writer know when to revise? Flower and Hayes suggest that the key variables involved in expert revision are *knowledge* (the writers' ability to recognize areas in the text that need revising and their ability to manipulate the text to improve it) and *intention* (the writers' goals). The cognitive process model is employed to observe three major obstacles that beginning writers confront in revising: detecting the problems in the text, diagnosing those

problems, and selecting a strategy to rectify them. The strategies that Flower and Hayes observed their writers using were varied, and the effectiveness of each type differed between experienced and inexperienced writers. Flower and Hayes noted two main strategies: The *Detect/Rewrite Strategy* in which the writer considers the gist of the area of text that needs attention and simply rewrites it without changing the gist; and the *Diagnose/Revise Strategy*, an option more open to experienced writers, in which the writer diagnoses (categorizes) the problem and makes new plans for the text in order to work around the problem. By observing these processes closely and studying the underlying processes of Reviewing (term used in their cognitive process theory of writing), Flower and Hayes are attempting to locate the parts of the revising process that give writers the most trouble.

REVISION ESTABLISHED: THE SUBPROCESS EXPLORED

Many writers have difficulty with revising their work, and often student writers are not being simply lazy or obstinate when they do a poor revising job or refuse to revise altogether. Like Perl, Lillian Bridwell (1980) observed that revision can have detrimental effects on the work of students because the writers do not understand what is expected of them. In "Revising Strategies of Twelfth Grade Student's Transactional Writing," Bridwell describes a study of twelfth grade student drafts of an informative/argumentative essay. The most frequent units of revision are at the surface and word levels. Most of the changes occur during the "in-process stages" (that is, while the writer is working on a single draft, not between drafts). She notes that there are "negative associations of surface level revisions and mechanics ratings, positive associations of between-draft changes and of quality level ratings, positive associations of word, sentence, and clause level changes and all ratings" (197). Patterns in revision strategies exist among these twelfth

graders and these patterns are associated with writing quality. The patterns, suggests Bridwell, are "both linear and recursive" :

It is possible for a writer to conceive of an idea and proceed linearly with the unfolding of that concept across the lines of his/her page until an endpoint is reached. However, far more typically some stopping occurs during the writing process, either for rescanning or rereading of the product. At this point the writer may either verify what is on the page or perceive some dissonance. Verification may result either in termination or the continuation of the writing process. Dissonance leads either to a decision to change, a decision to stop, or a decision to continue on without any alterations. The loops apply recursively until all dissonance is resolved or until the writer no longer desires to alter the product. (220)

Richard Gebhardt (1982) suggests in "Initial Plans and Spontaneous Composition: Toward a Comprehensive Theory of the Writing Process," a study which compliments Bridwell's point that writing is in fact neither completely linear nor completely recursive. Writing involves both the initial plans that a writer makes (which suggests a linear paradigm of prewriting then writing) and the spontaneous composition that occurs as we write--the recursive nature of composing.

Nancy Sommers' "Revision Strategies of Student Writers and Experienced Adult Writers" (1980) argues that experienced and inexperienced writers do in fact revise differently (and that their approach to the writing process is different as well). In the student writers she observed that they consider revision as little more than choosing better words and eliminating repetition. Their "revisions" consist primarily of deletions and substitutions. Experienced adult writers, however, consider revision to be finding meaning and fitting the text to the audience. Adult writers are much more likely to add or delete material and to rearrange sentences and paragraphs when they revise; their revisions consist of additions and rewording. Sommers also concludes that revision is a recursive process and that adult writers seem to work within the context of

this understanding. Student writers, however, incorrectly view it as the mopping up process that comes after the text is complete.

In "Understanding Composing" (1981), the title of which perhaps serves to illustrate that we do not understand the process very well at all, Sondra Perl also looks at the differences between skilled and unskilled writers. Perl states that "writing is a recursive process" (114), and that writers constantly reread their texts, returning to key words or phrases that renew their energy on the topic and to recover a "felt sense" of what they wanted to say. "Felt sense" is, according to its originator, Eugene Gendlin

the soft underbelly of thought. . .a kind of bodily awareness
that. . .can be used as a tool. . .a bodily awareness that. .
.encompasses everything you know and feel about a given
subject at a given time. . .It is felt in the body, yet it has
meanings. It is body *and* mind before they are split apart.
(quoted from Perl, 115)

Perl applies this definition to the composing process and uses it to explain the force that triggers revision. Good writers heed this felt sense, waiting for its return and satisfying it when it does return. This allows for "retrospective structuring" for self-expression and for "projective structuring," which meets the needs of the audience. Poor writers, suggests Perl, have not developed this felt sense, which might explain their revising difficulties. This also compliments Shaughnessy's observation that basic writers seldom reread their work.

Faigley and Witte move beyond the felt sense and stages by closely observing the revision process itself. The taxonomy of their study in "Analyzing Revision" (1981) compliments studies of revision such as those by Sommers (1980) by providing a way of indicating the significance of revision changes. Faigley and Witte's findings support the conclusions of Sommers that expert writers revise differently from inexperienced ones. However, they also noted that expert writers revise differently from other expert writers. Thus the number and kinds of changes made in a text depend on more than just the writer's abilities. This study only observes the effects of revisions on meaning,

which are linked to quality, but it does support the conclusion Perl draws that sometimes revisions made by inexperienced writers actually reduce the quality of the text. This study also implies that revision should not be separated from the rest of the composing process during instruction because it is an integral part of every aspect of that process.

Faigley and Witte propose and employ a different method of studying revision changes (before changes had been evaluated on the basis of the length of the change; length was associated with the significance of the change). Their taxonomy is built on how changes in a text alter the text's meaning. Types of revision changes are separated into two categories: those that do not change the text's meaning (Surface Changes) and those that do (Text-Base Changes). Surface Changes include Formal Changes (editing, really, these changes are made in regard to spelling, punctuation, format, and so on) and Meaning-Preserving Changes which include changes that paraphrase the text but do not alter its meaning. Text-Base Changes are broken down into Macrostructure Changes, "a major revision change. . . [which] would alter the summary of the text" (404) and Microstructure Changes which involve a "meaning change that would not affect a summary of a text" (405). Meaning Preserving and Text-Base Changes are made through additions, deletions, substitutions, permutations, distributions, and consolidations within the text.

Richard Beach does not compare poor writers to good ones as Perl and Faigley and Witte did. Rather, he compares nonrevisers to extensive revisers in his "The Pragmatics of Self-Assessing" (1982). Nonrevisers understand revision to be polishing and editing; they are convinced that their teachers want editorial correctness from their students. Extensive revisers understand revising in terms of "substantive changes in organization, logic, or support" (71). They are more aware of the reader's response to their goals. One of the biggest problems in both cases is in defining the audience and this is where assessing one's own text becomes pragmatic. It makes one scrutinize the

text, asking questions about the appropriateness or effectiveness of what has been written. Answers to these questions guide the writer to recognizing the need for extensive revision. Beach recommends Grice's Maxims (which fulfill the audience's expectations for informativeness, truth, relevance, and clarity) as a criterion for revision because these rules focus less on writer-based requirements and more on reader-based ones.

The question of audience is explored further in Ellen Nold's "Revising: Intentions and Conventions" (1982), which looks at revising as it is done to fit conventions (rules of grammar, syntax, and so forth) and revising to fit intentions (purposes, topics, rhetoric). The latter is a more complex process and the mark of a skilled writer. Nold suggests that it is easier to teach unskilled adults--as opposed to young children--to write, because the adults have already developed other metacognitive (a term used by cognitive psychologists for the review of the product of mental effort) abilities. Hence writing teachers should give their students revising strategies that will correspond to the student's level of abilities.

In "Decisions and Revisions: The Planning Strategies of a Publishing Writer" (1983), Carol Berkenkotter responds to the concern that studies done in laboratory settings are not good reflections of how writers write because it takes the writers out of their usual writing environment and puts them in an artificial one, usually with a contrived assignment to complete in a given period of time. Berkenkotter observes the writing processes of Donald Murray through protocol analysis, interviews, and by actually observing the writer as he worked in his study at his home. Her study compliments the findings of Emig in that Murray composed both extensively and reflexively, and Berkenkotter's findings also supported the theory purported by Sommers that writing is a recursive process. Her results, however, did not support the theory of the subject himself. Murray, who asserts that "writing is rewriting," in fact did little rewriting. He is an ardent planner. Also, her concerns that observing writers work in an artificial environment may not be a reliable method were

apparently founded: when Murray was put in a classroom with an hour to write for an audience he did not know on a topic he was not sure how to approach, he could not produce anything written. Problems with the study like the one Berkenkotter has produced are, of course, present. As she herself notes, "It's a trade-off, foregoing generalizability for the richness of the data and the qualitative insights to be gained from it" (139). But she also points out that "We need to replicate naturalistic studies of skilled and unskilled writers before we can begin to infer patterns that will allow us to understand the writing process in all of its complexity" (139).

Mimi Schwartz (1983) in "Revision Profiles: Patterns and Implications," suggests that we cannot teach revision until we have established guidelines for successful revision according to the reviser's needs (style, contextual difficulties, and revision concerns). In order to answer this need for guidelines, she proposes nine revision profiles to help identify "types" of revisers. In the Language Production and Regeneration area, one is either an Overwriter (writing "too much" text and cutting it back later) or an Underwriter (writing too little text and expanding later). In Structural Reformation, writers become Restarters of the text, Recopiers, Rearrangers, or Remodlers. Finally, in Content Reassessment, there are Copiers, Refiners, and Copyeditors. Schwartz is careful to point out that at some time writers are all of these, depending on the problems, or lack thereof, presented in the text. The benefits of using this profile are mostly pedagogical: the profile system gives a writer and evaluator a common set of terms with which to view and discuss a written text; teachers are able to "individualize" their comments to a particular aspect of a writer's process; and the system emphasizes the constant presence of revision throughout the composing process.

In another profile study with a pedagogical basis, Muriel Harris comments on the different behaviors and habits of writers who are either one-draft writers or writers who have to work through a series of drafts to produce a final text. ("Composing Behaviors of One- and Multi-Draft Writers," 1989). Observing

eight graduate students, four confirmed one-draft/final draft writers and four multi-draft writers, Harris notes interesting patterns in their processes. The one-draft writers all put off the actual transcribing of their texts until they had worked the text out in their minds; they did not begin to write until they had developed the focus of their paper. Their first drafts are already reader-based prose and are finished papers. These writers made few changes in their written text and in fact did little or no re-reading of the text once they had completed it. Since one-draft writers produce their texts quickly, they often forego what they may know is a better approach in their text in an eagerness to be done with the paper. Most of their invention takes place before they begin transcribing, hence they find writing a tedious repetition of what they have already worked through in their minds. The composing behaviors of multi-draft writers are opposite to those of the one-draft writers in every regard. They resist knowing what they will write about before they begin writing; freewriting, brainstorming, and generally working through the text are their moments of discovery. They find writing itself an exciting process of discovery and often resist closure as much as the one-drafters look forward to it. Their drafts, initially writer-based, are crowded with alterations in the text. They mull over approaches to the topic and other decisions and will often try several before settling on one. Writing instructors need to be able to identify behaviors like these in their students (and to be able to distinguish the sloths and procrastinators from people who truly write either quickly in one night or need at least a week to turn out a paper) and to lead them to a more moderate composing process. She points out, too, that "When we offer classroom strategies and heuristics, we need to remind our students that it is likely that some will be very inappropriate for our students" (189). That is, trying to make one-drafters freewrite or asking multi-drafters to produce an outline of their work before they have finished writing it is not conducive to improving their writing skills.

NEW METHODS OF RESEARCH: THE QUANTITATIVE APPROACH

Studies which take into account the "individuality" of each writer's composing processes constitute an interesting shift in composition research. We know enough now about the writing process to know that it is different for every student and writer and that a number of different approaches to teaching composition should be tried in the composition classroom. Researchers, in these studies, are back to looking at the work of small numbers of writers, smaller, more specific case studies as opposed to the more general and theoretical studies like those of Nold and Perl. In redefining revision, researchers have discovered that it is a different process each time an individual writer does it. There are similarities and the study of patterns of behaviors is a useful starting point, but broad generalizations are risky.

Another apparent move is that researchers seldom consider a text without considering the writer as well. Protocols and interviews and profiles have become commonplace in composition research. However, in an approach that he admits is "somewhat risky," Stephen Witte relies on written texts to make inferences about the composing process. Witte's work focuses on revision and, by drawing from different fields and theories, is redefining revision and revision research still further.

In "Topical Structure and Revision: An Exploratory Study" (1983), Witte focuses on the relationships between revision and topical structure and the use of topical structure analysis to understand contextual cues writers take in revising their texts. He also attempts to describe the effects of revision. Borrowing terms from the Prague School linguists, Witte identifies specific differences in good (easy to read and understand) and poor (difficult to read and understand) revisions made by student writers in reworking a passage of serious academic text. He looks at differences in syntactic complexity, semantic complexity, and sentence topics and semantic content. From this analysis one can infer the "discourse topic" (the principle topic of the text) and the "gist" or "macroproposition" of the text (which is a summary of the main

points of a text). Witte suggests that how well writers revise a text depends on how well they appear to understand the gist and structure of the texts they are revising.

The poorly revised texts are less effective than the well-revised ones for two reasons: 1) the poorer writers have more sentence topics, which may indicate that the writers had more difficulty in controlling the topical structures of their revisions and 2) the poorer revisers used parallel, extended parallel, and sequential progressions in different ways than the better revisers. The poorer revisers "often bury in sequential progression the most important sentence topics of the original text, topics which appear at higher levels of topical depth in both the original and in the high-score [good] revision." Witte's work compliments the work of Flower and Hayes and others who point out that writers must be able to identify problems in a text before they can correct them. Witte tries to identify precisely the linguistic areas that poor revisers have trouble working with. This study may have more implications for research (it is an exploratory study) than it has practical classroom application. The analyses are very sophisticated and do not involve the kind of criteria an instructor could easily apply to a student's work.

However, Witte's work *does* suggest alternative approaches to the study of composition and revision, and it is fitting that this survey closes with his "Revising, Composing Theory, and Research Design" (1985). He begins his article with a survey of the evolution of the current knowledge of revising in which he incorporates different approaches to writing instruction, assessment, and to revision itself. The assimilated information contributes to his proposed expansion of the current notion of revision; his expansion spins off from the hierarchical models of revision proposed implicitly by Sommers and Nold and explicitly by Flower and Hayes. Witte suggests that revision is not only retranscribing but also extends to a ~~pre-transcribed~~ text or a "pre-text." Witte argues that

if composing is a hierarchical process, then the subprocess of revising can be embedded into the subprocess of planning, the result of which is a pre-text that can take a number of forms and that can be revised in much the same way and for many of the same reasons that a writer would revise a written text. Two consequences of embedding the subprocess of revising into the planning process are that revising cannot be defined only as retranscription. . .and that the writer's pre-text must be seen as a causal influence on retranscription. (278)

Witte suggests that how writers "frame" their material before they begin writing is to a large extent responsible for how or how much they alter the text once the transcription has begun. This hypothesis is supported by Harris' later study of the composing behaviors of one- and multi-draft writers. Witte also points out that by focusing on the pre-text in revision studies, we would be altering the role of discovery in the composing process. The paradigms for the composing process itself may well be in for revision. As Zamel noted, the composing process "involves not only the act of writing itself but prewriting and rewriting, all of which are interdependent," and each time a discovery is made in one area of the process, it will likely affect the other areas.

REVISION SUMMARIZED

In the scope of this survey, from 1968 to 1989, significant changes have taken place in composition research and in research on revision. What is accepted today as commonplace knowledge was not even conceived of twenty years ago. The changes have been, in fact, radical.

Composition theory has evolved through a series of divisions in thought. The separation of process from product led easily into the distinction of revising from editing. When the composing process refused to fit into neatly linear paradigms of planning, writing, and editing, revision itself refused to remain confined to a distinct final step in the composing paradigm. The linear paradigms yielded to recursive paradigms which in turn gave way before the more fully developed paradigms that structure the composing process hierarchically and recursively. These new models include both the processes

of the mind as well as the internal and external cues that prompt a writer to alter his text.

What do these new models tell us about revision? Nold's (1979) definition, though incomplete, offers a good foundation for understanding modern revision theory: revision is "the retranscribing of the text already produced after a portion of the already existing text is reviewed and found wanting." The text is reviewed against the criteria of the writer's intentions. Nold's definition is incomplete because she suggests that there must be "text already produced" and an "already existing text" before there can be revision. As the work of Harris, Flower, Hayes, and Witte indicates, the "retranscribing" of information that is "reviewed and found wanting" may well occur in the pre-text aspects of composing. Flower and Hayes note that any process or subprocess, including, of course, evaluation and revision, may interrupt any other aspect of the composing process at any time.

The anomalies that remain in the current understanding of revision center on exactly what *causes* a writer to revise. What are the textual cues, the cognitive impulses, the internal and external factors that trigger the revising process? Suggestions of "dissonance" between intention and results (Bridwell) and the "felt sense" (Perl) attempt to define the phenomena, but these theories are still very general and relatively impractical in terms of actual classroom application.

And finally, where is research on revision going? The research is becoming more and more specific, isolating the individual processes of the composing process, then isolating them further into the study of their subprocesses. Researchers are identifying precisely the problems that individual writers have in producing finished texts so that soon the composition classroom will resemble a writing center. Instructors will be able to identify the problems their individual students encounter and will be able to prescribe, as it were, a specific remedy for a specific problem. Many of the profiles and evaluation methods that would allow teachers to do this presently

are still too complicated for easy application or are too general to apply to individual writers. But given the progress of the last two decades, the writing classroom at the turn of the century promises to be a different place. Witte notes that "the universe of composing and our perceptions of it can be characterized by only one constant--change."

CHAPTER III

ESL REVISION STRATEGIES

Even though ESL programs are often located in college English departments, they are separate from the "regular" English department in the kind of work they do. Teaching composition to a student who is learning English as a second language is very different from teaching native students composition. The ESL student not only has to learn how to communicate in writing in English, he or she also has to learn the rhetorical structure of English, which, as Kaplan demonstrated (1966), is probably quite different from the rhetorical structure of the student's native language. The ESL instructor's approach is necessarily different from the native teacher's.

Since the fields are different, the research between the fields differs. Unfortunately, there has not been an explosion of research in ESL composition of the magnitude of that in composition of native speakers. Vivian Zamel (1976) lamented that research in ESL composition is "almost totally non-existent" (195) and again in 1982 that work in this area was still "almost negligible" (195). She also pointed out that the studies that had been done were primarily concerned with product, not process. In fact, most of Zamel's articles, beginning with "Teaching Composition in the ESL Classroom: What We Can Learn from Research in the Teaching of English" (1976), have noted that ESL research needs to keep up with research on native speakers. She has felt in the past that her colleagues have ignored the research in the native field.

Influenced by second language writing research, the implications of which continue to emphasize the linearity of writing in English. . . , and concerned with prompting language learning, ESL writing continues to be taught as if composing were a matter of adopting preconceived rhetorical frameworks, as if correct language usage took priority over the purposes for which language is used. (167)

Since 1976, however, other ESL researchers have looked at native research. They have suggested, as Zamel has, that in many cases the findings in native research would indeed be useful in guiding ESL research and might be applied to ESL studies (Raimes, 1979; McKay, 1981; Taylor, 1981; Watson, 1982).

One question in ESL composition centers on the distinction between written grammar and compositional skills. Are ESL instructors, by providing writing models in the writing class, really teaching writing or are they merely, as Taylor (1976) suggests, "providing written practice in grammar" (367)? Whether to employ controlled or free composition exercises is a question of imitation versus invention in writing, copying versus composing. In controlled composition there is no opportunity for revision. Perhaps this is one reason not much research has been done on the composing processes, and more specifically on the revision strategies of ESL writers; until ESL students are proficient language users, they may not get many opportunities to really compose or revise.

While controlled composition has predominated in ESL classrooms in the past, researchers are questioning this traditional pedagogy. The practice was, in fact, under fire as early as fifteen years ago. Zamel (1976) argued that the teaching of composition should move away from controlled, grammatically-oriented instruction because it has "little, no or even harmful influence upon the students' writing ability" (72). Barry Taylor (1976) suggested that "there is no theoretically sound reason to wait until an ESL student has mastered all or even most of the complexities of the language before we proceed to teach these free compositional skills" (369). Raimes offered a combining of controlled and free composition (1976) in which the teacher subtly controls the task by predicting what kind of writing a topic will produce. The teacher can guide a writing assignment by controlling the complexity of the topic; the student, however, is free to invent his or her own answer.

Certainly ESL composition is moving in the same direction as native composition research, and interest is being taken in the ESL student's actual composing processes. In two more recent articles (1982; 1983), Zamel challenges the traditional pedagogies of ESL instructors who, anticipating trouble with organization and mechanics, focus on the surface level of their students' papers. Ultimately, these teachers are only teaching product to their students, not process. Writing is a process of discovering meaning; no writers know what, exactly, they will write before they begin writing. Zamel suggests that what is good for teaching native speakers is good for teaching ESL students--who also must be given a chance to explore for meaning in their writing and to revise their work. By trying to structure the writing processes of ESL students, the teacher runs the risk of reducing the process to a series of task-oriented steps, and while task-oriented lessons may be appropriate in other areas of ESL instruction, Zamel argues that it is inappropriate in writing instruction. Writing itself is not task-oriented in the sense that one task must be completed before the next task may be started. This would imply that the composing process is linear, and it is not. It is, as we have noted, recursive.

Zamel goes on to argue that revision is the key to good writing and should become the main component in ESL writing instruction (1982). In the follow-up study (1983) her students seemed least concerned with linguistic problems and the findings indicate that "skilled ESL writers explore and clarify their ideas and attend to language-related concerns primarily after their ideas have been delineated" (165). These writers understood that "composing involves the constant interplay of thinking, writing, and rewriting" (172). In short, then, these skilled ESL writers were not preoccupied with editorial correctness in their work (their papers were not, in fact, totally devoid of grammatically-related errors), but they, like native writers, were experiencing writing as a process of discovering meaning.

Ann Raimes, in response to Zamel's 1976 article, asks

If we had students like that, would an ESL composition class pose so many problems? The diversity of skills within a class, the variety of skills to be taught, the uncertainty about the nature of the composing process, the conflicting views about free or controlled composition are the problems besetting the ESL composition teacher. (1976, 388)

And there is the rub. Not all ESL teachers can follow Zamel's lead to allow their students to compose freely to experience the process of discovering meaning. ESL classes are even more varied in the students' levels of ability than native classes are. In a single class, an instructor may have students who are not "ready to write" (Zamel, 1983) mixed in with students who are. Even in her 1983 study, Zamel noted that the skilled writers made surface level changes primarily near the end of the process, but the least skilled were distracted by local concerns from the outset and rarely made meaning-altering changes as they wrote. Thus, even though the students in her study were all labeled "proficient," the revision strategies ranged from those used by experienced writers to those of inexperienced writers.

Ann Raimes (1985) looks at the composing processes of unskilled L2 writers to determine how they differ from the processes of unskilled L1 writers. She found some similarities between the two: "some of the ESL writers were similar to unskilled L1 writers in their lack of planning and their largely recursive processes at the sentence level" (250), and, like Perl's subjects who wrote "from an egocentric point of view," the ESL writers in Raimes' study were primarily producing "writer-based" prose. More than similarities, however, Raimes found differences between the composing processes of unskilled L1 and L2 writers. The ESL students were more committed to the writing task than Perl's writers were; that is, even though the ESL students recognized their writing task as "school-sponsored" and contrived, they still worked more intensely than the native speakers, and they produced more text. Raimes suggests that this may be due to the ESL students' learning to speak

and write in English and therefore taking the assignment as a language learning exercise. Even the low-level ESL students, contrary to Raimes' expectations, were not preoccupied with error correction. They read back over the text frequently, but they were looking for meaning in the text, not errors. Perhaps they were not intimidated by the thought of error because they understood they they were still in the process of learning to use the language effectively and would, as part of the learning process, make errors.

The fact that writing generates language, even for the unskilled writer, suggests that composing is a useful part of the learning process for ESL writers. Also, texts generated by students may be used as class material for reviewing different aspects of effective language use (when to use articles, for example); the students will probably be more interested in these materials than the more impersonal material in their textbooks.

Ann Johns (1986), recognizing that since many ESL students' instruction "may have been focused on sentence-level errors" (70), these students will have a difficult time making the leap to discourse-level writing, suggests using a schema theory approach to help these students produce acceptable prose. "Schema," explains Johns, "was first used by the cognitive psychologist, Bartlett, in 1932, to describe 'an active principle in our memory which organizes elements of recall into structural wholes'" (71). This principle can be applied to the expectations a reader will have approaching a particular text. Thus, one can explain an American reader's expectations to a foreign writer and have the writer revise the text according to those expectations. Johns illustrates this by pointing out that an American reader will ask certain questions when reading about an accident (where it happened; what happened, who was involved; how did it happen; and so forth). By presenting an American reader's expectations, the instructor guides the student toward producing writer-based prose. Johns is not advocating that ESL instructors return to controlled writing or practice patterns, though her methods may share some of the same foundations with these earlier pedagogies. The guidelines

she suggests are applied to work the ESL student has already completed; they simply direct appropriate revisions. As we have already noted, students are often unsure how to approach the revision of their papers.

Johns' study, one of the few published articles to date that mentions revision in the title, is largely pedagogical, as is the greater part of most ESL composition research. Though the research gap between native and ESL composition research has been narrowing since Zamel noted that ESL research is "almost negligible," research on revision strategies is still rare. As we have already noted, this may be because ESL students, until recently, were not really allowed to develop their composing processes even though they were enrolled in composition classes. Also, again as we have noted, the ESL researcher is confronted by a wide range of possibilities.

The problems besetting the ESL researcher are as complex and diverse as those confronting the ESL instructor. One concern is that writers from different parts of the world approach writing very differently. They each bring a different rhetorical background to the writing task. In 1966 Kaplan observed that

Logic. . . which is the basis of rhetoric, is evolved out of a culture; it is not universal. Rhetoric, then, is not universal either, but varies from culture to culture and even from time to time within a given culture. (2)

Because Arab students do not bring the same rhetorical background to composition as Oriental students do, they will not compose or revise in like fashions. Therefore, in order to identify patterns in the ESL students' processes, the researcher must observe students who actually *do* share a pattern. There are about five thousand languages in the world today, a quarter of which are literate. Is it necessary, then, for the ESL researcher to perform 1250 different studies? In addition, the researcher may also have to consider the attitudes different cultures have toward writing as well as what constitutes good writing in a particular culture.

ESL researchers not only have to take their subjects' general linguistic background into consideration, they must also consider the students' individual backgrounds. For instance, native writers can be classified by writing skill levels because these writers are often working in the only language they know. However, non-native writers, especially beginning students, cannot be classified as easily. When an L2 student has difficulty composing in English, does the difficulty arise from a language barrier, or is the student simply a poor writer, period? Proficient ESL language users, those who have a good understanding of English rhetorical structures and schemas, will likely use English more like native English speaker. And they will write and revise like a native speaker--*if* they are proficient writers in the first place. It would be inappropriate, on the other hand, to list a student who is a proficient writer in his or her own language as a basic or unskilled writer if the student is experiencing difficulty with composing in English.

It may well be that these problems with contrastive rhetoric have prevented research in ESL composition from making as much headway as the native field has. The ESL field involves many more variables that must be taken into consideration in order to provide viable results. Unfortunately, no model which takes all of the variables into consideration exists. The number of variables makes it improbable that such a model can exist; we do not even know what all the variables are yet. Researchers would do well to follow the studies done on native speakers, but considerable preliminary investigations to identify the variables above must be completed first.

CHAPTER IV

OVERVIEW OF COMPUTER-ASSISTED COMPOSITION

In the late 1970's, composition research branched out into an entirely new area, an area previously dominated by science departments and corporations; composition researchers began to observe writers on the computer. When small computers with word processing programs were first developed, it seemed that only secretaries and gadget buffs were using them to produce written texts; in the beginning word processors were little more than glorified typewriters.

But all that has changed. Like research on composition, research on computer-aided composition has increased recently. Researchers generally agree that word processors fundamentally change the writing process and revision strategies but beyond this *donne*, little else is agreed upon.

The amount of work done on computer-assisted composition is overwhelming. In the scramble to gain information on what the computer can do, a proliferation of articles and studies has appeared. At least seven journals devote themselves exclusively to research in this area. The articles range from the ethics of using computers for class-assigned composition (Cox, 1986) to how best to employ them in the composition class (Fitschen, 1986). To cover in-depth the work that has amassed over the last decade would be to add another book to the total. This chapter provides a brief representative overview of how the computer influences the composing process of writers.

Several studies indicate that students enjoy using word processors for composition (Combs, 1985; Stromberg and Kurth, 1983; Rodrigues, 1985; Harris, 1985) and that students have little difficulty in mastering the basic commands necessary to electronically word process (Kurth, 1986; Brown,

1985). Students also feel more in control of their writing when they are using word processors (Daiute, 1983), and Brown's students suggested that working with computers had improved their writing abilities.

Researchers, however, are not as optimistic as the students. Besides the general objections to using word processors in composition courses--that the systems are costly for the school and often inaccessible to students; that students are intimidated by the technology, hence are inhibited in writing; that since only part of the text can be displayed on the screen at one time, the writing process is violated; and that the gadgetry distracts the writer--there is a great deal of controversy surrounding the use of word processors to teach writing. Results of case studies and experiments often conflict or contradict each other.

Word processors alter the composing process in as many different ways as there are writers, and, as the research by Sommers, Faigley and Witte and others have demonstrated, there is a difference in revision strategies between good and poor writers and among good writers themselves. Naturally, since writers revise differently when using "conventional" writing techniques (i.e., pen and paper, typewriters), they will all approach composing and revising on the computer differently. Collier (1981; 1983) suggests that students who already revise well benefited from using word processors in their revision; weaker students, however, tended to stick to more conventional revision strategies such as simple deletion and substitution at the surface level. Lansing's 1984 study corroborates these findings by observing that while both planners and revisers enjoyed working with word processors, and while the revision strategies of both groups were limited to the abilities of the software they were using, the revisers seem to adapt more easily to using computers. The planners were frustrated by the difficulty they encountered in trying to effectively plan their papers as they sat before a computer screen.

Some researchers have been concerned that students may try too hard to make their composing behaviors fit the computer, which is not, of course, what

instructors want--since there is no one correct behavior of writing. In order to help students get used to working with computers, Fitschen (1986) offers that beginning writers should revise their work on printed, or hard, copies. Richard Elias (1984) warns teachers that, though the computer may change students' behavior as they adjust themselves to working with the computer (for example, they may revise more), the computer cannot itself change student writing. He suggests that the computer should be reserved to help with mechanical writing problems and the instructor (along with pen and paper) should be part of the development of higher cognitive skills.

It would seem, then, as Bridwell, Sirc, and Brooke concluded in their 1985 study, that word processors merely allow for the "*extension* of revision strategies already present in the traditional processes of our students" (191). The ways in which computers alter the composing process are by facilitating it (as for extensive revisers) or by hindering it (for ardent planners or for people who do not type well).

How the word processor affects revision for all writers, seemingly a more basic issue than the question of how word processing affects individual writers, is still contended by researchers. How much do computers change composing and revising, in general, if at all? And, if they do change these processes, are the changes positive or negative?

Some studies, approaching these questions quantitatively, attempt to discern if students are writing longer papers, or if they are making more revisions as they compose. Flinn (1986) and Collier (1983) suggest that papers composed on the word processor are longer than papers written by students using pen and paper while Kurth (1986) finds no difference in the length. Sommers and Collins (1984) suggest that word processors allow students to become more "fluid" writers, and they observe that students who work on computers revise more intensely and for longer periods of time. Collier, in 1983, found that the number and complexity of the operations his inexperienced writers employed for revision increased significantly when they

used a computer. "The subjects made two-thirds more substitutions , engaged in twice as much reordering, and reduced their deletions by two-thirds" (151). These increases were by and large at the word, phrase and clause level. Other studies, however, indicate that the increase in the number of changes is either negligible or non-existent (Kurth, 1986; Hawisher, 1987). Harris (1985) reports that her students actually made fewer revision changes when they composed on computers. When students do revise their papers on a computer, they generally restrict themselves to changes in grammar and punctuation (Kane, 1983) and other changes on the surface level (Rosenbaum, 1984).

Part of the reason for these conflicting results is that researchers do not agree in their definition of revision. In her study, Harris distinguishes revision, changes that alter a text's meaning, from editing and proofreading changes, which do not alter the text's meaning. Thus, her students made fewer text-base or meaning-altering revisions on the computer than with pen and paper or typewriters, but the same or even more editing changes, a finding which compliments the results of other quantitative studies like Collier's.

Another difficulty in obtaining clear results is that in some of the studies the students were using text-editors (spelling-checkers and so forth) while in other studies the students were not. For instance, the results of Collier's study were influenced by the fact that his students were using text-editors, which, of course, point local errors out for writers to correct.

Hult (1986) is concerned that word processing programs and general and stylistic analysis programs in particular may reinforce unproductive revision strategies of inexperienced writers by encouraging them to see the text in parts instead of as a whole (mostly the fault of the small monitor screen) and to concentrate on simply making substitution and deletion changes (as Sommers illustrated that poor writers tend to do). Because the text-analysis programs work on local levels, suggesting substitutions or that the student delete something in the text, the student may be less likely to add to, cut, and

rearrange their texts. Instead of reducing anxiety about spelling, grammar, and punctuation errors, these systems make them appear more important. Also, Collier (1983) notes that text-editors "did not encourage the subjects to make serious and elaborate additions to their essays" and that revision by a text editor "had little or no advantage over the traditional method for most of the domains of a text" (152).

On the other side, Flinn (1986) noted that the longer papers her students were producing on word processors received higher scores when graded holistically. And McAllister and Louth (1987) suggest that, given enough time, students will begin to make more meaningful revisions. They observed their writers for an academic year. At the end of the first semester, the students performed much as the other studies indicated they might: the majority of their revisions were made on the surface level. However, by the second semester's end, the students showed significant improvement in the kinds of changes they were making, including moving to the text-base level.

The interesting thing about the results of the studies of Flinn, McAllister and Louth is that the researchers do not attribute this increase in quality of revision directly to interaction with the word processor. Flinn felt that the students were responding to the instructional emphasis she put on fluency, word choice, and mechanics. McAllister and Louth observed that the most significant increases in revision occurred when the students were working in the computer lab outside of class time, and they suggest that this may be due to environmental influences and a positive change in the students' attitudes. Kurth, too, found that working in a computer lab has motivational value, and it facilitates group discussion and peer editing. Sudol (1985) suggests that working in a room full of students creates a sense of community in which the students' writing becomes a "public act" (331); collaboration among students increases and improves the students' sense of audience. In another study, Stromberg and Kurth (1983) found that working in a lab apparently creates a sense of community among the writers and they are more likely to share their ideas

with each other. This increase in collaborative activity may mean an increase in creativity on the part of the students--though the computer has been charged with reducing creativity in writers.

Catano (1985), responding to concerns that creativity and computer technology are incompatible, argues that word processors in fact augment creativity by making the writer search for meaning. He suggests that even simple text-editors "can extend the capacity and thus the creativity of the writer" (312) because the writers do not have to concern themselves with mechanics and editing decisions.

Rodrigues (1985) found that composing on word processors positively influenced the writing process of her basic writers. According to her report, basic writers internalize the process of writing more completely when working with word processors and they become more self-reliant writers. Even the small screen size, elsewhere found to be a hindrance, benefits basic writers because it encourages them to slow down and focus on one part of the text at a time. Generally, basic writers are overwhelmed by the writing task before them and must work their way to being able to manipulate successfully the text globally. Basic writers also find it easier to revise sequentially on computers, moving from surface to text-base changes, because the text-editors take the worry out of the smaller formal changes.

In "The Computer as Stylus and Audience," (1983) Daiute reports positive results from using computers for composition. She suggests that text-editors and word processors reduce physical and psychological constraints on the writer, thereby allowing the student to concentrate more on the content of the paper. Computers eliminate writer's cramps and messy texts, and text-editors take the drudgery out of editing. They also simulate the "interactiveness of the speech situation" (142) by checking spelling, grammar, and so forth, for the writer and by suggesting possible alternatives. The writers are involved in the paper because they must make the ultimate decisions. The computer does not correct the errors itself; it only helps the writer learn to "initiate and control

the revising process." Also, because computers are fastidious about the commands they will accept, writers must pay careful attention to the screen and computer, which may cause them to regard their texts more carefully. Daiute also suggests that the computer encourages a faster flow of thoughts, because typing is faster than writing (at least for those who can type), which keeps the memory free to produce more ideas. And the blinking cursor, like a "ready" signal, prompts the writer to keep moving constructively. The computer also "seems like an audience, thus stimulating the writer to take a reader's point of view" (141) which helps reduce egocentricity in writing. From a cognitive approach, then, the computer appears to have many benefits.

Sudol (1985) considers the possibilities of using computers in composition courses to improve student-teacher interaction. Students and teachers could hold conferences at the keyboard which would allow students to assume authority over their texts; since the teacher/reader responds orally and immediately, the student gets a sense of reader reaction to his work; and, because the teacher can fade into the background while the student reworks his paper, the student is encouraged "to produce large, independent trial revisions" (334).

Certainly, then, computers have their advantages and their drawbacks, and certainly they affect the composing process. Until now, much of our discussion has centered on quantitative results or positive applications for the computer in the classroom. The question of quality still remains; do students write any better, do they make more meaningful revisions, when they compose on computers? The answers here, too, are conflicting.

Several researchers have found significant improvements in the papers written by students on word processors (Hull, 1984; Arkin and Gallagher, 1984; Hunter, 1983). Kemp (1987) and Kline (1985) indicate that there is an improvement in quality when students work with text-editor prompts.

However, Hawisher found "no positive relationship between extensive revision [which computers may encourage] and quality ratings" (145). And

Rodrigues found that, despite the fact that her students showed improvement in their writing processes, the quality of their finished work was not significantly higher than the products of the basic writers she had taught the year before in a conventional class.

Both Hawisher and Bioarsky suggest that this poor revision performance may be due in part to the fact that many students simply do not understand revision; they do not know how to revise.

Revision, as indicated by research discussed in the first chapter, must be taught to students. Left to their own devices, students will consistently edit their papers as opposed to really re-seeing and reworking (revising) them. Even the computer is no replacement for a teacher; computers only enhance the composing process, they cannot replace instruction (Kurth, 1986; Hult, 1986).

COMPUTERS AND ESL COMPOSITION

As with research on the revision strategies of ESL students, research on computer-assisted ESL composition is, in Zamel's term, "negligible." Where the computer has gained attention in ESL is in computer-aided instruction: using computers for drill and practice exercises for grammar, spelling, and so forth (Wyatt, 1984). Wresch's "Computers in the English Class: Finally Beyond Spelling and Grammar Drills" (1982) and his follow-up article in 1983 explore the possibilities of putting CAI to use in teaching composition, but his work focuses on the native classroom. Certainly ESL classes have moved beyond spelling and grammar drills, but "while ESL classes profit from computer-assisted writing, little research has been done to reveal in exactly what ways the computer should be utilized as a tool for non-native writers" (Wallace, 1988; 94).

And as with composition in general, the ESL student has more tasks before him in using a computer than a native student does. Since the student's native alphabet is possibly different than the English one, the

student may be confronting an English computer keyboard for the first time. The ESL student also has to rely on instructions and commands written in English in order to operate the computer. ESL students can be, understandably, apprehensive about writing in English; asking them to compose on a computer may add to the apprehension.

Andrea Herrmann (1985) suggests that this apprehension may be reduced by assigning short, easy assignments which are not heavily restricted by time constraints. Wallace (1988) observes that the ESL instructor will probably have to do much more to alleviate the students' anxiety: computer manuals should be rewritten in easily followed prose devoid of jargon; students should be introduced to the computer slowly, using at first only the most basic and necessary commands; and time must be made to give students instruction away from the computer.

Despite the fact that preparing an ESL class to work on computers is, at least initially, more work for the instructor, the benefits seem to be worth the effort. Herrmann (1985) notes that computers ultimately improve integration of all areas of ESL instruction: listening, speaking, reading, and writing. She goes on to add that, by using word processors, "students become highly engaged in writing and learning language, gain new sensitivity to the flexibility of language, appear more receptive to feedback concerning the need for revision and editing, and improve their overall writing and language ability" (1).

Much like the programs that Wresch refers to that are able to respond to errors in students' work in seconds, even at a global level, Parkhurst (1984) investigates tutoring systems for the ESL classroom that can monitor free composition for errors. The programs meet "some of the criteria for an artificially intelligent tutoring system" in that they can, in some cases, "respond to input in terms of global paragraph meaning, as a human being would" (1). These programs can also aid in invention by helping the students generate

information through asking questions, and they can help a student evaluate his or her own work.

There has been no work done specifically on the computer-assisted revision strategies of ESL writers although Wallace notes, like Kurth and Hult, that students must be given instruction on how to use computers effectively. Like many writers, ESL students may spend "almost the entire class writing and erasing one sentence, claiming it does not 'sound correct.' At the end of the writing period, they may have completed only two or three sentences" (93).

Perhaps a reason for the lack of research in the area of ESL computer-assisted revision strategies is that, much as with composing and revising in general, researchers and instructors have a good idea what to expect. If basic writers are better able to internalize the composing process but are still preoccupied with local concerns in their text, it follows that the unskilled ESL writer might demonstrate the same behaviors. And if skilled native writers profit from using the computer to compose, then the proficient ESL writer might be expected to benefit as well. Yet we need to be sure. If enough studies indicate that ESL writers and native writers use computers in similar ways, then much of the work for the ESL researcher has been done. If not, then the area warrants investigation.

CHAPTER V

METHODS

Given the findings that word processors fundamentally alter a writer's composing process and that proficient ESL language users and writers share certain composing behaviors with skilled L1 writers, this exploratory study attempts to determine how the computer might affect the revision strategies of advanced ESL students. The question in this study is not *if* the writing process of the ESL students is affected, but *how* it is affected.

PURPOSE

This study attempts to determine how the computer-aided revision strategies employed by ESL students differ from those employed by their native-speaking counterparts, those who are working on computers and those who are not. This investigation will 1) employ a viable classification scheme for identifying the textual changes made by the ESL students; 2) apply this scheme to the ESL students' texts; 3) analyze the types of changes the ESL students make in their papers and when they make them; 4) determine the relationship between the changes made and the quality of the students' work; and 5) compare these findings with the findings of similar, already published, research done on native writers' revision.

DESIGN

Four questions will guide the research:

1. What types of changes do ESL students make in their drafts as they work toward producing a final, polished paper?
2. How effective, in terms of improving the text, are these changes?

3. What influence, if any, does the stage of composing at which they make the change have on the quality of their work? That is, are the differences between the types of changes made in earlier and later drafts?
4. How do these changes differ from the changes made by native-speaking students?

SUBJECTS

The ESL writers involved in this study are six students from an English 131 class taught at the University of Tennessee, Knoxville, spring semester, 1989. English 131, a ESL composition course, emphasizes the process of writing: prewriting, identification of audience and purpose, drafting, peer responding, and revising are all covered during the semester. It is the equivalent of the introductory English composition course (101) taken by native students. The subjects in this study are two men and four women (two from The People's Republic of China, two Malaysians, one Korean, one Japanese) who are, like the students in Zamel's 1983 study "ready to write," ready to communicate their ideas in English. These students earned scores of between 75 to 89 points (out of a possible 100) on the grammar and reading section of a departmental placement test given by the English department. The students also had compositional scores of 1 or 2 (1 being the highest) on the writing section of the same exam.

PROCEDURES

A number of tools were used for summative and formative evaluation in this project. They include questionnaires (an example is included in the appendices), interviews, specific writing tasks, text comparisons. The tools are introduced and discussed in this section and under Methods of Analysis.

Questionnaire and interviews In this study the subjects were asked to fill out a three-page, multiple choice questionnaire on their writing experience, experience with computers, and writing habits and strategies. The

questionnaires were followed up with interviews at the start of the semester and at the semester's end to discover if any change in the students' opinions about the course, the computers, or their writing had occurred. The researcher's attempts to remain unobtrusive distanced her from the student's composing processes. The questionnaire and interviews help to bridge that gap.

The writing assignments The papers used in this study are the same papers the students wrote using the Microsoft Word program on Macintosh computers as part of their regular 131 course requirements. This study looks at the second and fourth class assignments. Assignment two (A2) was done in the middle of the semester (week 5), but after the students were fairly comfortable working with the computers. Assignment four (A4) was completed near the semester's end (week 10), after the students had been graded on their first three papers.

Assignment two required the students to write an informative essay telling an American reader about an object in the student's native country that is an integral part of a custom or tradition. Assignment four, an argumentative essay, was a more difficult one. The students were asked to read two articles, one in favor of segregating gifted students into classes from their average peers, the other against making this distinction. The students were then asked to take a stance and argue in favor of their position.

The researcher collected three drafts and the final text for the second assignment and two drafts and the final text for the fourth assignment. As sometimes happens in composition courses, time at the end of the semester was tight, and the students simply did not have enough time to produce three drafts and a final text in the time the assignment allowed. The students did not receive grades or written instructor comments on the drafts; rather, the drafts were worked on by the student individually, evaluated by peers in the class, and discussed with the instructor during conferences and class time.

The writing sessions The students spent most of their class time (three hours a week) working on the computers; the instructor lectured to introduce new assignments or when he saw a problem common to most of the students that warranted class discussion. The students worked on their papers outside of class, and no attempt was made to monitor or guide the work they did on their own. The advantage of observing students as they worked in the classroom, which is one of the university's computer labs, on assignments that were part of their coursework, is that their working environment was not contrived for the purposes of this study. There has been discussion over how much researchers alter their subjects' composing processes by putting the subjects into artificial writing situations: for instance, using protocols, putting the writers in unfamiliar writing environments, assigning contrived topics, time limits, and so forth. Donald Murray noted that he felt like a "laboratory rat" when he participated in Berkenkotter's study. He was unable to write at all when asked to compose in an unfamiliar setting; he preferred to work at home.

Even as this researcher walked around the room during classtime, the students would inevitably stop writing if I stopped behind them to note their progress on a paper. We all find it difficult to work with someone looking over our shoulder, and it is nearly impossible to be an unobtrusive observer.

Evaluation of the work. The grades the students earned on the papers studied and throughout the semester in general were used to estimate the students' writing levels. The grades were assigned by a professor in the University of Tennessee's English department according to the following (simplified) scale:

- A: excellent work; original ideas and good organization; very few errors.
- B: good work; good ideas competently presented; few errors.
- C: average work; ideas solid though probably unoriginal, presentation may be weak or incomplete; errors throughout the text.
- NC: no credit is assigned for the work; some aspect of the students' work is preventing clear communication. There may be too many surface errors, or

the organization may be especially weak. The student is often required to rewrite the paper.

The instructor also assigned B+ and C+ grades; the plusses mean that the work is still within a particular range (B or C) but that the work is very high in that range.

METHODS OF ANALYSIS

Each draft written by the students was transferred from Microsoft word into Wordstar so that the IBM compatible Jurisoft Compare-Rite program could be used to record the changes made between texts. The Compare-Rite program juxtaposes two texts at a time, marking additions in bold type surrounded by brackets ([]) and marking deletions by striking through the letters and surrounding the deleted text with braces ({ }):

Occasionally, {every year's} **[every year]** Spring Festival is about Feb. 6, 89. Spring Festival is Chinese New Year which {depends on china traditional} **[the traditional Chinese]** calendar **[tells about]**. People call it the lunar calendar. {Interesting thing is that} **[By the way,]** each year is named after one of {12} [twelve] different {animal} **[animals]**.

Each between-draft stage (the IBM print-outs which record the changes the students made from one written draft to the next--as opposed to in-process stages which are the changes the student makes while actually writing out the draft) was analyzed--in sequence--according to

the types of changes made in the text (formal changes, meaning-preserving changes, and micro- and macro-structure changes in meaning),

the level of the change (surface changes to changes on the multi-sentence level), and

the effectiveness of each change made.

Types of changes The taxonomy proposed by Faigley and Witte (1981) was used to analyze the types of revision changes. In this scheme, the affect

of the revisions on the text's meaning were considered, not changes in length. In earlier studies done on revision, the length of the T-units in a student's paper determined the relative sophistication of the text.

Faigley and Witte divide revision changes into two main categories: Surface Changes and Text-Base Changes. Surface Changes include *Formal Changes* and *Meaning-preserving Changes*. The *Formal Changes* are editing or cleaning up changes which do not alter a text's meaning. They are divided into five subcategories: spelling; tense, number, and modality; abbreviations; punctuation; and format. The *Meaning-Preserving Changes* include changes that "paraphrase" the concepts in the text but do not alter them. *Additions* add information to the text that could have been inferred by the reader without the addition having been made to the text.

They decided to have a simple ceremony for Cixi's birthday => They decided to have a simple celebration ceremony for Cixi's birthday.

Deletions do the opposite so that the reader must infer what had been explicit in the text.

It is a difficult dance to perform. => It is a difficult dance.

Substitutions trade words or longer units that represent the same concept.

Sometimes three lions dance together. => Sometimes three lions perform together.

Permutations involve rearrangements or rearrangements with substitutions.

Let's see, for example, the academic subject matter. => Let's use the academic subject matter as an example to explain this.

Distributions involve transferring information in one segment to many segments.

It is said people that people are not allowed to use a knife for several days after New Year's. Otherwise, your fortune is hard to say. => If you use a knife for several days after New Year's, your fortune is unsure.

Consolidations occur when the writer moves information from many segments into fewer segments, as in classroom sentence-combining exercises.

China lost the war between China and an eight-country united army, which consisted of eight countries from Europe. The war was called the War of Drugs. => China lost the war between China and Europe which was called the War of Drugs.

The second category, Text-Base Changes, includes changes that alter meaning in a text. This class is divided into two subcategories: *Microstructure Changes* (minor meaning changes) and *Macrostructure Changes* (those changes which would affect meaning in a text enough to alter a summary of that text; major changes in a text's meaning). For both Micro- and Macrostructure changes, Faigley and Witte employ the same six operations (addition, deletion, substitution, permutation, distribution, and consolidation) identified under Meaning-Preserving Changes. However, unlike Meaning-Preserving Changes, Micro- and Macrostructure Changes affect the concepts in a text. An example of a Text-Base Change, in this case a microstructure addition, would be:

The Malay's culture is a kind of mixed culture of Hinduism and Islam. => The Malay's culture is a kind of mixed culture of Hinduism and Islam, but more than ninety percent of them are Muslims.

Charts for the different operations, addition, deletion, and so on, are separate from the charts for types of changes. In this, the categories are explored as they are in Sommer's study which does not consider these operations for the different types, but at all levels.

Figure 1 (below), from Faigley and Witte's 1981 study, illustrates the hierarchy and categorization of the scheme used to determine the types of changes made in the texts.

<i>Revision Changes</i>			
<i>Surface Changes</i>		<i>Text-Base Changes</i>	
<i>Formal Changes Changes</i>	<i>Meaning-Preserving Changes</i>	<i>Microstructure Changes</i>	<i>Macrostructure Changes</i>
Spelling	Additions	Additions	Additions
Tense, Number, and Modality	Deletions	Deletions	Deletions
Abbreviation	Substitutions	Substitutions	Substitutions
Punctuation	Permutations	Permutations	Permutations
Format	Distributions	Distributions	Distributions
	Consolidations	Consolidations	Consolidations

Figure 1. Faigley and Witte's Taxonomy of Revision Changes from "Analyzing Revision" (403, 1981).

Level of changes In addition to Types of changes made in a text, this study also looks at the Level of the changes made. The researcher chose to employ a modified version of Bridwell's Revision Classification Scheme from "Revising Strategies in Twelfth Grade Students' Transactional Writing." The modified form of Bridwell's classification scheme is outlined as follows:

1. Surface Level (the same as Formal Changes, above)
2. Word Level
3. Phrase Level
4. Clause Level
5. Sentence Level (as punctuated by student)
6. Multi-Sentence Level (two or more consecutive sentences,

tallied once for each sentence involved.

Bridwell's scheme goes on to include seven to ten subcategories for each of these levels. For a study as small as this one (six writers compared to Bridwell's 100), such a detailed analysis is impractical. Bridwell was looking for patterns of revision among a much larger population; a pattern is unlikely to emerge with such a small sample. Also, Bridwell's subcategories include Addition, Deletion, Substitution, Order shift, Expansion, and Reduction; these areas of change are already included in the Faigley and Witte taxonomy.

Effectiveness of changes The final area of investigation in this study is the effectiveness of the individual changes. Every time a change was noted in the texts, the change was marked with either +, o, or -. The plus sign (+) indicated that the change was an effective one in working toward a solid final draft. The change did not necessarily have to be correct. For example, if a writer added a sentence to a text to clarify a previously unclear point, then that addition was marked as an effective change even if the sentence itself was incorrect in structure or tense. An example would be:

At Chinese New Year, using knife might be something bad happens to you in next year. => At Chinese New Year people not use knives, because it would mean that you sever your good luck from you in the new year and something bad happens.

The zero (o) indicated that the change was neither beneficial nor detrimental to the text. If one misspelled word is replaced with the same word still misspelled, then the change did not affect the text's quality (*intresting* replaced with *intreresting*). Finally, the minus sign (-) marked changes that actually made the text less effective: for instance, a correct verb tense replaced with an incorrect one.

Gifted students should be separated from the non-gifted in some situations. => Gifted students should be separates from the non-gifted in some situations.

STATISTICAL PROCEDURES

To investigate the types, level, and effectiveness of the changes the writers made and when they made them, this researchers followed very basic statistical procedures. The type, level, and effectiveness of each revision made between written drafts was recorded; the records were totaled. The results of this totalling are included in this paper in six charts: level of change and type of changes for each student are given in terms of revision frequencies per 1000 words. The student essays in this study average around 1000 words, so recording the changes made per every 1000 words makes the frequencies smaller and easier to work with. Also, since other researchers measure frequencies in the same unit, these results are easier to compare. The effectiveness of change is given in percentages. (See Tables 1--8 in Appendix A.)

CHAPTER VI

FINDINGS AND DISCUSSION

This chapter looks at the results of the analysis of the between-draft revisions the students made; 1,318 revisions in all were recorded. The eight tables for these changes are located at the end of this chapter. The first half of this chapter is devoted to discussing these results in terms of what they say about the individual students' composing processes. Information from a questionnaire and two interviews is incorporated into this discussion to help interpret what the numbers mean and to fill out the discussion in general. Discussion of the results overall follows, then a more focused comparison of the results of this study with the results of several published essays on revisions of native speakers is presented.

THE INDIVIDUAL WRITERS

Student One

Student one was the weakest writer in this study. During the first half of the semester her papers consistently received No Credits and low C's. After several sessions at the ESL writing center and conferences with the class instructor, she moved into the solid C range.

On the questionnaire, student one indicated that she felt that she does not write well-formed sentences but that she does know most of the important rules of grammar. Generally, her grammar was fairly good, but she did not write, as she observed, rhetorically solid sentences. Many of the revisions she made between her first, second, and third drafts of assignment two (A2) indicate that she was almost aimlessly, and unsuccessfully, making changes in her paper. One fourth of the changes she made at the 2.2 stage were ineffective; another one fourth were indifferent. After she went to the writing

center, and conferenced with the instructor, her paper grew by 300 words and the number of revisions made increased nearly fivefold (from 27 to 121). Ninety-four percent of these revisions were effective changes; the paper, however, earned an NC.

As with A2, the majority (in this case, all) of the revisions in A4 were made in the final drafts of the paper. In A4, too, the majority of these changes were made on the surface level, (11.44 formal changes per 1000 words; 32.41 word level changes/ 1000 words). But even the weakest writer made meaning-altering changes (2.88 microstructure changes/ 1000 words; 9.53 macrostructure); and while most changes were at either the word or phrase level in both papers, she did manipulate the texts at the sentence and multiple sentence levels as well.

In A4, 99% of this student's changes were effective: proof positive that, if nothing else, individual help can positively influence a student's composing skills.

In both cases, student one primarily revised her papers by adding to them. Additions generally accounted for a whole third of her revisions in the final stages of her work. Deletions and substitutions accounted for the majority of the other changes.

The weakest student rated her own writing skills (in English) as "poor" and said that, while she thought she knew most of the important rules of grammar, that she did not write well-formed sentences. Grammar, spelling, and punctuation and finishing her papers on time concerned her more than organizing a paper (she ranked organization as one of her strengths), and looking for mistakes in grammar and punctuation.

She liked turning in drafts of her work because it made her take the drafts themselves, and the process of working through multiple drafts more seriously. It gave her a chance to locate and correct mistakes in her writing.

By the end of the semester, this student's revisions were more effective, and the concern with local problems in her text had lessened. She describes

her composing process as "keep thinking a few minutes, write an outline, expand my ideas, revise, edit my errors and present a paper." It is significant that she separates revising from editing because it suggests that she is adopting the composing behaviors of skilled writers by leaving the smaller, formal changes for near the end of her task, and attending to global concerns earlier.

Even though this student contended that she composed in English all the while, her early work indicated that she may have developed her ideas in Chinese. The sentences were, in terms of structure, often very difficult to follow. However, near the end of the semester, she appeared to be making the effort to adhere to English rhetorical structures, which may involve actually thinking in, and composing in, English.

Reactions to the computer. Student one found working on the computer to be more difficult than working with pen and paper because she did not type very well, and because it was difficult to remember the whole text when only part of it appeared before her. In fact, though she recognizes the advantages of using computers, she would have rather taken a pen and paper class. This student wrote her papers out by hand before entering them into the computer; she revised on hard copies. She found that she made more changes in her text when she used the computer, and that she changes the text constantly as she writes it out.

Student Two

The second student, who attended an American high school, had an interesting way of beginning her papers. She methodically outlined, using Roman numerals and capital letters, each of the points to be presented in the paper. Her paper evolved as she filled in the outline.

In A2 most of the changes, 66% of which were surface changes, focused on clarifying and expanding on minor points in her text. In the second stage many of the changes were near the end of the paper and in her conclusion,

areas that she had not planned as carefully in her outline. Finally, in the last stage, over 90% of the changes were on the surface level. Like skilled writers, this student concentrated on polishing her text at the end of the process. The single macrostructure addition was to clarify an important point in the paper by providing background information.

In A4, student two began with a slightly more informal outline; this time she listed a series of questions and her paper grew from the answers. The idea behind the technique (or habit) was the same, but the technique itself changed slightly, probably due to the time restriction. The conscientious planning however, did not save the student from making nearly as many meaning-altering changes in her text as meaning-preserving ones. (She made 23 meaning-altering changes/ 1000 words, and 29 meaning-preserving changes/ 1000 words.) In forming her arguments and persuading her audience, this student more closely approximated Zamel's process of discovering meaning. Over 50% of the changes the student made were additions, most of the rest were fairly evenly divided between deletions and substitutions. Here, as in her first paper, it is important to student two to make her arguments and ideas clear to her reader. In fact, she named this and the organization of the paper as her two biggest concerns when writing a text.

It is interesting to note that the student who methodically, and successfully, organizes her papers from the outset, was least confident about her abilities in this area. Actually, this student employs some of the very methods researchers and instructors recommend to produce reader-based prose. (She may well have been taught these methods in her high school.) She asks reader-oriented questions as she evaluates her texts, much like Grice's Maxims (Beach, 1976); Do I have enough information for my reader? Is anything unclear? Have I talked about everything I said I would? and so on. This student reads and assesses her own texts very critically, and she uses outline to structure her paper before she begins writing it. Perhaps she consciously employs these methods to compensate for an aspect of writing

she considers her weakness. The result is that her papers are very clear to her reader and are well-organized.

Student two was an average writer; she earned C+'s and low B's on most of her work. An analysis of the types of changes she made and the frequencies with which she made them do not label her as either a proficient or deficient writer.

Once this student wrote a text, she rarely made changes in the text's meaning. Throughout the three drafts for A2, she made only one macrostructure change. In A4, she made a high number of meaning changes (15/ 1000 words as opposed to the 3/ 1000 words she made in A2), perhaps owing to the nature of the assignment. Like less-skilled writers, she had relatively high numbers of formal and word level changes at the outset, but like skilled writers, she waited until near the end of the process to make editing types of changes.

In both papers this student made many revisions that did not improve her text and were probably not necessary. In stage 2.2, 33% of the changes were indifferent. This suggests that she was playing with substituting similar words and larger lexical units to make the paper read better. Indeed, she made more substitutions than any other kind of change as she neared the final draft.

Reactions to the computer. The second student worked quite well with the computer despite some initial reservation (the computer "chewed up" her second paper as she prepared to print it). At the end of the semester the student observed happily that her writing process had changed for the better because of the computer. In fact, she even purchased one to use at home. She thought the word processor is "incomparable to anything when it comes to organization," an area with which she had difficulty.

However, despite the miracles of the machine, this student could not revise well on the computer: "It is very hard for me to point out the minute mistakes and the overall atmosphere of the essay at the same time through a narrow screen."

Student Three

This student was the most advanced writer in the 131 class; his papers scored high B's and A's throughout the semester.

As is apparent from the tables, he made more additions to his text as a means of revising than any kind of change. His A2 paper doubled in length from the first to the final draft and his A4 paper grew by a third. Over 40% of his changes in both papers were additions. Substitutions were the next most frequently occurring (around 30%), then deletions (10%).

Generally student three did not make revisions in his paper at all until he completed the text. He tended to tinker endlessly with his papers, especially during the last phases of writing. Over 70% of his changes in the last stage were meaning-preserving changes in both papers. The time constraint on the fourth paper forced him to work faster, but the bulk of the revisions were still made in the final drafts.

In A4, this student had the highest frequency of revision in his last stage of writing in the class (81/ 1000 words; the population average was 40). Since elsewhere he generally had the lowest or among the lowest frequency of revisions (41/ 1000 words compared to a population average of 75), the nature of the argumentative essay may explain this change.

Student three, the best writer in the class, has many traits of the good ESL writer. He composes in English, using an English dictionary, thesaurus, and grammar handbook. In fact, he was the only student to use these last two reference materials and the only student not to use an English-Native Language dictionary.

Like student two, student three is an ardent planner, though he does not outline his papers formally. He works out ideas and the order of these ideas at the beginning of the paper and their development becomes the paper. In A4, the strict ordering of ideas gave way to a sort of brainstorming as he listed possible examples, but he was having to speed up his process to stay within

time constraints. Like the second student, too, this student asked certain questions which led him to produce reader-based prose from the outset. He calls them the "WH" questions (who, what, where, when, why).

He kept editing concerns for the end of the process: "As I type out my list of data and ideas to form sentences and paragraphs I don't think too much about the grammar, sentence structures, spelling and punctuation errors, because I can easily correct them later on after I am through with my first draft."

As Raimes (1985) observed her writers doing, student three scans his text whenever he gets stuck because this helps him to develop new sentences. Also, Flower and Hayes (1980) observed that expert writers stop often to reread their texts, making adjustments then moving forward, often using this rereading to generate new text.

Like the experienced writers Faigley and Witte observed, student three defines revisions as having to do with global textual concerns. He observed that "Revision requires one to re-examine and reconsider the information that I need to add or remove." He also noted that the phases of his writing (developing ideas, organizing data, and revising) "are not like consecutive sequences like first phase, second phase, and third phase, but rather like a *web*. One phase overlaps or coincides with the other phases."

Reactions to the computer. This student worked well with the computer and all along preferred it to writing papers by hand. The biggest advantage he noted was the ease with which he could change his papers; he even offered that he was given to making more changes in his text because of the computer. Other than this he did not think the computer had really changed his writing process, however. He noted that "developing a paper on a computer requires of me the same phases of writing process: developing ideas, organizing ideas and data, and revising as in handwriting." His only complaint was about the occasional inaccessability of the computer. Once he had to wait an hour and fifteen minutes for the opportunity to work on his paper, a situation he called "disgusting."

Student Four

Student four was a solid B writer. She rated her writing skills in English as only fair (although she was one of the better writers in the class) and she, interestingly, noted that she always composes in Japanese then translates her drafts into English. (The best writer in Zamel's study, the English major, did this as well.) Her initial drafts were rough, exhibiting many of the errors common to Japanese students: inappropriate articles and incorrect use of plurals, but by the final draft these errors were, for the most part, edited out. By the end of the semester, this student said that she now composed in Japanese only when she was having difficulty getting something written down.

Though she felt that she was unfamiliar with most of the important rules of grammar and was a poor speller, these were not among her primary concerns in writing or revising papers. (However, at the beginning of the semester she had been troubled by "the comma situation" which she studied carefully and apparently resolved.) She considers the organization of ideas to be most important, lists this as one of her strengths as a writer, and looks for good arguments and structure in her own works as well as in the work of her peers. She suggested that the computer aides her in organization as well because it made it easier for her to move from a text that is largely the product of brainstorming to a well-organized essay. Naturally, a lot of revision must occur in between.

This student, in both papers, made the highest or among the highest frequency of revisions. In A2, the population average was 46 revisions/ 1000 words. Student four made 45 changes/ 1000 words in stage 2.1. 53 in stage 2.2, and 75 in stage 2.3. In A4, the class average was 42/ 1000 words. This student made 47revisions/ 1000 words in 4.1 and 64 revisons/ 1000 words in 4.2). Instead of outlining or brainstorming or the like, she simply begins writing with the first sentence of the text. She changes the text each time she makes an error (so we could infer that she makes even more changes at the

in-process stages), and when a new idea strikes her, she stops work to write the new idea down. When she revises her papers, she does a great deal of moving the text around and apparently harbored no qualms about changing examples and the direction of her text. In A2 especially, she reworked her approach and experimented with examples, but in both papers she was apparently using the writing process to discover meaning changes in her process. She refocused her arguments and brought up new points and new approaches near the end of the process. She also put considerable effort into seeing her ideas flow smoothly and logically.

Student four, a solid B writer, made among the highest number of revisions in her work, and the changes were distributed fairly evenly among all of the categories; her text-base changes, especially at the macro level, were high--in fact, they were the highest by far in the group studied. Her average in A2 was 14 microstructure changes/ 1000 words compared to a population average of 9; also in A2, she made 15 macrostructure changes compared to a population average of 4/ 1000 words. In A4 she averaged 14 micro changes/ 1000 words and 11 macro changes/ 1000 words compared to a class average of 9 and 4 respectively.) She also had among the highest number of ineffective changes in the group, though these represent mistakes at the local level. Her arguments and the structure of her papers consistently improved.

Her changes were overwhelmingly additions, as is evidenced by the growth of her papers. She also made many deletions in A2, and, in both papers, she made many permutations in her text, mostly reworking awkward phrasings, in both papers.

She waited until the end of the process to devote herself to polishing and editing her papers.

Reactions to the computer. Student four enjoyed working with the computer and she worked on being able to compose into it directly, though she always made revisions on hard copy. She did observe that with the computer she wrote "more smoothly" and that she "liked writing papers better

than I imagined." Obviously for someone who revises as much as this student does, the computer is a tremendous help. This student noted that she probably made even more changes when she worked on the computer simply because she was free to do so and because it was so easy. It also made it easier for her to correct her work on the local level because the errors were easier to find. The only problem she had with the computer was that it could not be fitted easily into her writing habits: she prefers to work very late in the night, after midnight, when the labs are often not open.

Student Five

Student five was one of the weaker students in the class; her papers were generally in the C range. She ranked her writing skills as poor and observed that she did not write well-formed sentences, was a poor speller, and did not know most of the important rules of grammar. When writing a paper, grammar, spelling, and punctuation--and organization--were her primary concerns. Interestingly, where most of the students spent four to six or more than six hours working on a paper, this student said that she spent only one to two hours producing a paper. She found writing in English frustrating and apparently raced through the task in order to complete it.

As she composes she tries to correct each error as she makes it, and when attempting to improve her paper, she looks for improvements that could be made on the word level.

Once this student has begun a task she seldom changes its direction or overall gist. She does make changes in meaning but these are mostly on the microstructure level. Even her macrostructure revisions were achieved on relatively small (phrase and clause) levels.

In A2 most of her alterations were additions. In stage 2.2, for instance, additions alone accounted for 56% of all changes made. From the outset student five worked on producing reader-based prose, and she constantly fills in details and rearranges her text. Though it does not show up on the specific

type of analysis used in this study, this student makes many global changes in her text moving information from one paragraph to another, and switching sentences sentences around. Her initial texts, though complete, are generally skeletons of what she will ultimately produce through adding details and examples.

She consistently made changes on the formal and word levels, not waiting for the end drafts to work on editing her text. Indeed, in both papers, a very high percentage of her changes are still on the microstructure level at the end of the text. In A2 she made 19 microstructure changes/ 1000 words; the population average was 12. In A4, she made 17.03; the population averaged 10. In A2, she waited until the next to last draft to include a history of the Malaysian Lion Dance, the subject of her paper.

Reactions to the Computer. Student five initially reacted very negatively to working with computers, and blamed many of her writing difficulties on the computer. She contended around midterm that she found working on computers more difficult than writing her work out by hand, and that, if given the opportunity, she would move to a conventional class. Part of the difficulty may have been that she was expecting too much from the computer. She was annoyed that the computer could not respond to errors she made in grammar, organization, and point of view. Her only positive insight was that the computer could help her "beautify my paper in the sense of format." On the whole, she did not think that writing on a computer had affected or improved her skills and habits at all. She observed that her papers were of the same length and quality they always had been.

By the end of the semester she found more positive things to say about word processors: revising is facilitated, time is reduced, organization is easier, and the spelling-check is helpful. However, the charges against the computer were increased: the computer was a boring, non-living and uninspiring object; it was complicated to use; it reduced her creative abilities and ruined her eyesight. On a more moderate level, she also complained about the

inaccessability and the fact that not being able to see all of her text at once was disconcerting. Rather inexplicably, however, this student insisted on composing and revising directly on the computer; she resisted using print copies to revise her papers.

Student Six

This student exhibited very different composing behaviors between the two assignments; one might not even suppose going by the charts that they were written by the same student. The only similarity is that he generally waits until the end to polish the papers, and that most of the changes are distributed between deletion and substitution.

In A2, student six made no changes until he had completed the text (the 25 changes recorded are the result of running a spell check and correcting the 25 misspelled words). After the text was complete, he made many changes in the text in all categories. This student works mostly by going back and adding information to the text, although he also rearranges the information as he needs to.

In A4, this student made the lowest number of changes (32/ 1000 words compared to a population average of 75/ 1000 words), none of which were at the macrostructure level, and an insignificant number (1.09 out of 33.97) at the microstructure level. Most students, in this assignment, allowed their arguments to develop as they wrote the paper, but after student six had set his course, he did little else to the paper.

Though one of the weaker students in the class, student six ranked, a little inappropriately, his writing skills as "very weak." Actually, while his initial drafts are decidedly writer-based, his revising skills are quite good.

He said he felt like he knew most of the important rules of grammar; from the beginning of his study of English, grammar was emphasized. He named planning and organizing the paper as his primary concerns. Perhaps one reason that the argumentative essay received less of his attention than did the

informative essay might be that this student had improved his organizational skills and simply did not need to rearrange his written text as much to get his ideas "in order."

In A2 he used the process of writing to discover meaning in his paper; he allowed the focus to move from Chinese birthdays in general to the birthday party of a single person, to the consequences of that party. In A4 he used the writing process simply to convey a meaning he had already developed before he began writing the paper.

Reactions to the computer. Though student six responded favorably to the computer in general (he noted happily that the spell-check had freed him from carrying around his hefty Chinese-English dictionary, and that revising his papers in general was much easier), he found using the computer more difficult than writing by hand and would have preferred to take the conventional class--despite the fact that his handwriting is difficult to read. Also, even though he had been composing on the computer for more than three years, he still preferred to work out his revisions on hard copies. The problem of only being able to see part of the text at once was distracting, he explained.

This student observed that the computer changed his writing habits by facilitating revisions, which he contends is the most important part of writing a good paper: "a good article needs several times revision."

But, he also points out that "writing needs thinking and attention, and using a computer needs thinking and attention, too." He, like Fitschen (1986), suggests that writing the first draft by hand is a good way for beginning writers to approach composing on a computer, at least until one's typing skills improve.

THE STUDY OVERALL

Though these ESL students are proficient writers, they are not as advanced apparently as Zamel's (1983) students. They are in a freshman level class so

they are not necessarily students who are "completing university-level assignments at the sophomore and junior levels" (170). However, the writers in this study worked in ways very similar to those of Zamel's students.

Zamel reports that the "ESL advanced writers understood that composing involves the constant interplay of thinking, writing, and rewriting" (172) and that these students "clearly [understood] what writing entails. They know what to anticipate, how to pace themselves, and what to focus on as they write and rewrite" (180). The students in this study, too, were surprising with the fairly sophisticated insights they had to their own processes. Student three noted that his phases of writing were not linear, but rather like a "web," and the other five students agreed by the semester's end that revision was the most important part of their composing process. Each student was able to communicate his or her own composing patterns, and every one separated revising from editing. At the beginning of the semester, none of the students was able to do this; one student said that his writing behaviors had been a "blank" to him before. The sixth student contended that revision is more important to good writing than the actual initial texts a writer produces. Even if the initial text is poor, it can be revised to become a solid essay.

Zamel observed that her students "rewrote as they wrote, some revising entire chunks of discourse, some attending to the clarification of a previously stated idea" and that revising was evident throughout their composing process (172). Though the students' in-process revising strategies were not formally observed in this study, the students could often be seen gazing at the computer screen for a while then either deleting or rearranging information or hurriedly typing new information into the computer. When asked what they were doing, the students generally responded that they were "stuck" and were reading through their texts, planning where the paper should go next. Zamel's students also paused when they became stuck, and after rereading through their texts several times, "they discovered how to go on" (173). The high frequency of changes the students in this study made as they moved from one

draft to the next also readily indicates that the revising process is at work from the first draft through to the last one.

The actual revision concerns of Zamel's skilled and least skilled ESL writers were the concerns shared by the same level students in this study. In both cases all of the writers attended to surface-level features and changes at some point in their writing. However, the skilled writers made changes at this level usually near the end of the process while the least skilled writers in both studies were distracted by problems on the local level and tried to correct these problems as they went. But as she observed of her writers and as the writers in this study claimed, the linguistic problems concerned them the least. Zamel's writers developed strategies that allowed them to bypass their hypercritical editor, such as marking words they wanted to check again, leaving blank spaces to fill in, or briefly going back to their native language. Many of the students in this essay, though all of them contended that they composed in English, were observed working with notes writing in their own language, and all but one said that they used their native language to get through rough spots in their texts.

Where the students seem to lack insight was in ranking their writing abilities. Only one student placed his level at "fair"; the other students identified their skills as either poor or weak. If we were to look at only their preliminary drafts, this might well be the case. However, the final papers suggest that the students are either good or fair writers with only one poor writer in the group. The rough drafts are permeated with errors in syntax and grammar and other surface level mistakes, but these are for the most part absent from the final drafts. While their actual writing skills may not be very strong in that they are not yet able to compose smoothly in English, their revising skills--moving from writer to reader based prose--are advanced. Their revisions were nearly always effective, and they nearly always identified places in the text where a reader might not be able to follow them or might require more detail. These effective changes, however, generally appeared

after peer-editing sessions or teacher-student conferences. But it is to the students' credit that they respond to suggestions with effective revisions.

By the end of the semester, all of the students felt that their writing abilities had improved and that their new understanding of their own writing processes was largely responsible for the improvement. This may be due to the fact that the students had come to understand revision as a process of improving a paper and not some sort of punishment for having written a poor text.

The additions to or deletions from their papers were generally effective and necessary changes. These students were very aware of their audience, more aware than many native freshman writers seem to be. Five students indicated that the most difficult part of writing in English is deciding how to present their ideas and arguments so that they can be understood by an American reader. (It was the weakest writer who did not name this as the difficult part of writing in English. She was primarily concerned with grammar-related problems, and the ordering of ideas in her paper.) Where native writers may think that their readers will naturally understand what they have written because the paper is in English and on a topic with which both reader and writer are familiar (as in the perennial essay describing a dormitory room), the ESL students are aware that their language must be precise in order to communicate to the reader. They are aware that the ceremonies and customs that are part of their culture are likely to be unfamiliar to their American audience and so must be explained in great detail. The students in this study paid considerable attention to detail in their work.

The other major concerns were the organization and clear presentation of ideas. Obviously, A4 was a test of their abilities in this area. After the instructor covered basic strategies for writing argumentative themes (point by point versus summary by summary presentation, certain rhetorical signposts, and conventions such as "the author states" or "notes" or "argues," for example) the students began work. After their initial drafts were complete, the class spent a class period in group discussion reading each other's papers

and arguing their points. All but the fifth student made most of their revisions after this class discussion (the population averaged 25 changes/ 1000 words in 4.1 and 50 changes/ 1000 words in 4.2), and even she made a high number of changes (51/ 1000 words in 4.1; 44/ 1000 words in 4.2). The sixth student, though he made most of his changes after the discussion, did not, however, change his arguments or his approach to the assignment. He only clarified and strengthened certain parts of his arguments. This class discussion helped the students to identify their audience and the task before them more clearly. Once they discussed their views with a peer who did not agree with them, they could locate where their arguments needed strengthening.

As Sudol (1985) and others (McAllister and Louth, 1987; Flinn, 1986) observed, a class may become a community of writers. This class did, especially as they worked out their argumentative essay in class. Furthermore, throughout the semester the students spontaneously exchanged papers during the class in order to get feedback on their work in addition to the planned peer-editing sessions. They would discuss their ideas with each other or offer encouragement. Not only was composing process itself facilitated, working together in the computer lab made the computer less intimidating.

Their willingness to help each other also made the transition to computer-assisted composition easier since the students who had already had experience with computers helped those who were having trouble. All of the students approached working on a computer in their English class with some degree of apprehension and resistance. One of the better writers noted that she was "stunned" when she learned on the first day of class that she would be working with computers. She observed that "English composition itself imposed a heavy burden on me, and, in addition, Dr. Wallace wanted to hold class in the computer lab." This, in fact, was the class's reaction overall. After a few initial problems, however, all but a few students in the class overall

found that using a computer was a great advantage when it came to composing. The students especially appreciated the spelling-check program and the ease with which they could revise their papers. Also, since most of the students considered their handwriting to be difficult to read, they appreciated the neatness of the typed text.

Four of the six students composed directly into the computer; the other two, who were also the weakest writers in the class, essentially used the computer as a typewriter. They wrote their papers out by hand and revised them on printed copies. These students had a difficult time working with the computer because their typing skills were weak and because they found it disconcerting to be able to see only part of the text at a time. This observation does not suggest that being able to compose on a word processor makes one a better writer, but it may indicate that weaker writers find the task of manipulating a computer, added to composing in their second language, overwhelming. Working with print copies, as Fitschen (1986) observed, is one way to reduce the anxiety.

By the semester's end, all of the students agreed that they had profited in some way from working with computers. Even those students who had earlier responded that they would have preferred to have taken a conventional class indicated that they would continue writing the papers on word processors after this class ended.

COMPARISON WITH STUDIES ON NATIVE WRITERS

That the advanced ESL writers in this study composed and revised their papers like advanced ESL writers in Zamel's study and that they generally approached computer-assisted composition apprehensively, but eventually adapted to the system, as Herrmann (1985) and Parkhurst (1984) suggested would be the case, really comes as no surprise. However, the fact that the results of this study thus far concur with studies already published in these areas lends validity to this study's results.

What is perhaps more interesting is the relationship between the composing strategies employed by the ESL writers in this study and their native peers who compose both on and off of the computer. As we have already noted, Zamel (1976; 1982; 1983) strongly contends that ESL writers who are advanced enough to compose in English should be encouraged to do so. ESL writers who can compose at advanced levels are those writers who have apparently developed an understanding, even a passive one, of English rhetoric; they will naturally compose much as native speakers do, adhering to the conditions of English rhetorical structure. Since ESL students compose much as native writers do, then, it would seem to follow that they would employ many of the same revision strategies.

In order to explore the relationship between advanced ESL and native composition, I have chosen the results of three published studies with which to compare my own results. These studies, by Lillian Bridwell, Gail Hawisher, Lester Faigley and Steven Witte, and Nancy Sommers, are introduced below. Each of these studies observes the composing processes of students who are nearly the same age as the students in this study, and each studied large enough populations to be able to establish certain patterns in revising strategies. The results of these studies have been corroborated by other studies, so they are as reliable as current research methods will allow. The findings of other studies have been included where applicable.

Only parts of each study could be compared with the results of this study. For instance, while I, like Bridwell, recorded the level of changes each of the students made, I did not look at the in-process stages of revision, which she did. Also the writing assignments in each study differed in kind and length and so forth. The students in this study wrote papers twice as long as the ones in the other studies. Thus, comparing the strict frequency of revisions made at the macrostructure by, say, an advanced writer in Faigley and Witte's study and an advanced writer in this study would be irrelevant. For example, in A2 student four made the same number of macrostructure changes as the expert

writer (19), but in the next paper she revises more like an inexperienced student, making a very small number of macrostructure revisions. The kind, type, and level of a writer's revisions depend to a large degree on what he or she is writing, why, for whom, and a host of other considerations. Comparing general results, for instance, at what level the highest frequency of revisions were made was useful.

Lillian Bridwell (1980)

The results of "Revising Strategies of Twelfth Grade Transactional Writing."

Bridwell's study reports the results of the analysis of 6,129 revisions in 100 randomly selected sets of twelfth grade students' drafts of an informative/argumentative essay. The revisions were analyzed at three stages: in-process first draft, between draft, and in-process final draft and at six levels ranging from surface to multiple-sentence changes. She found that the high school writers made word level changes with the highest frequency throughout the process and surface level changes were the second highest. The greatest number of changes at all levels occurred as students were composing their final draft. In my study, as well, the highest frequencies of changes were divided between the word and surface levels. The greatest number of revisions were made by the ESL writers near the end of the process, but unlike Bridwell's students who made increased revisions at all levels at this near-end stage, the ESL writers changes were mostly just editing changes at the word and sentence level. About 55% of the students increased their revisions at all levels, but this was not a consistent pattern. Also, the increase in revision, even at the larger sentence levels, can be accounted for by the fact that there is more opportunity for revision in the later, longer drafts.

The papers Bridwell's students worked on averaged about 400 words; the ESL students' final drafts were anywhere from 800 to 1600 words long, averaging around 950 words. And yet the ESL students made significantly

fewer revisions than the native writers did. Bridwell's students made nearly the same number of revisions for every 100 words that the ESL writers did for every 1000 words. In her study Bridwell suggests that better writers seem to have internalized their writing processes and correct writing habits so that they do not need to revise as much as poorer writers do to produce a polished final draft. However, it seems improbable that the ESL students simply internalized their writing process ten times as efficiently as the native writers. Rather, Bridwell points out that a vast majority of these changes were made at the in-process stages than at the between draft stages. The in-process revisions of the ESL students were not recorded. Another possible explanation is that ESL writers do not have as many options as native writers for expressing themselves in English. This includes both vocabulary and structure. Since ESL writers are not familiar with the available options, they have no way of knowing what they could change to.

Gail Hawisher (1987)

The results of "The Effects of Word Processing on the Revision Strategies of College Freshmen."

In her study, Hawisher explored the effects of word processing on the revision strategies of 20 advanced college freshman who composed a series of four papers on and four papers off the computer. The results of 4,084 between-draft revisions of 80 essays were analyzed. The papers were all under 500 words long. Hawisher's study differs from the work of many of her colleagues because she found that computers do not lead to increased revision and do not improve the quality of the text. While we cannot know for certain whether or not the ESL writers made an increased number of revisions when they worked with computers, the fact that all of the students observed that they do revise more suggests that they probably did. The quality of the ESL students' papers improved if for no other reason than the spell-check corrected their frequent spelling errors. Hawisher's students, however, were

not using any kind of text-editor. In her results, too, Hawisher discerned a significant negative correlation between the number of meaning-preserving changes made by a student and the quality of his or her work. There was a significant positive correlation between the number of macrostructure changes and the text's quality. There were no such correlations in my study. What Hawisher's results suggest is that students who make changes primarily at the surface and meaning preserving levels are the weaker writers; better writers work with meaningful changes in their text. However, in A2, the weakest writer in the 131 class had the second highest frequency of macrostructure changes in her text. The paper received a failing grade. By the same token, the most advanced 131 writer made the fewest number of macrostructure changes in his drafts. Clearly Hawisher's results do not compare well in this instance.

Another interesting, though confusing, aspect of Hawisher's study is that her students made more text-base changes in their text than they made surface changes. This is almost never the case; as in Bridwell's study, the highest frequency of revisions is usually at the surface level. Hawisher's explanation for this is that her writers were all "academically able" and the fact that the "students added more meaning changes than surface changes on and off the computer supports Faigley and Witte's (1981, 1984) hypothesis that able students tend to make more meaningful changes that result in good writing" (153). However, Faigley and Witte (1981) did not observe that advanced students made more macrostructure changes than they made any other kind of change (the figure is, in fact, half the number of formal changes, half the number of microstructure changes, and and an eighth of the number of meaning-preserving changes), but that they made more macrostructure changes than inexperienced student writers. There may be another reason that Hawisher's students made more text-base changes than surface ones, but it is not explored in her article.

That the ESL students made most of their changes on the surface level does not suggest that they are not "able" writers. Because they are

composing in another language, they are simply more likely to make surface errors where a native writer would not; thus, they have more errors to correct on this level. That they do correct their errors effectively (In A2, the students averaged 83% effective changes; in A4, 91% of their changes were effective) indicates that they are able writers. After students have developed an understanding of English rhetorical structures, they are not necessarily more likely to make mistakes in meaning any more than a native writer is. Also, the ESL students' papers were nearly always twice as long of the native writers in Hawisher's study so they had a greater number of opportunities to make changes at smaller levels. It is instances like this that indicate comparing the results of native and ESL studies can be misleading.

Lester Faigley and Steven Witte (1981)

The findings of "Analyzing Revision."

In Faigley and Witte's study, six inexperienced student writers, six advanced student writers, and six expert adult writers were asked to write an informative essay. As in Bridwell's study, the texts were analyzed at the in-process stage in the first draft, again at the between-draft stage, and a third time at the in-process stage of the second, final draft. Even though in-process revisions were included in this study, the frequency of revisions was about the same as the frequencies in my study.

These researchers found that most revisions of all kinds occurred between the first and second drafts, the inexperienced writers making surface changes and the advanced and expert writers making more of their changes on the text-base level and turning their attention to the surface level in their last stages of revising. In both assignments, the ESL writers generally made increased numbers of revisions at all levels near the end of their composing processes. As we have already discussed in comparing results with Bridwell's results, the results do not compare well. The student with one of the highest frequencies of macrostructure changes (11.7/ 1000 words) made the

lowest grade in that set of papers; the student who made almost no macrostructure levels (2.6/ 1000 words) earned the highest grade.

One of the major findings of Faigley and Witte's study was that, not only do skilled writers revise differently from unskilled ones (Sommers, 1980), but that skilled writers revise differently from other skilled writers. One expert writer made almost no revisions in his work while another expert writer revised his work extensively; a third expert revised mostly by deleting from his text. This study with the ESL students shows nothing if not that writers of nearly the same abilities revise very differently from one another. All of the students in the 131 class earned approximately the same scores on a placement exam, yet their composing and revising behaviors were in few ways similar.

One of the major findings of this ESL study, then, is a sort of addition to Faigley and Witte's major finding: not only do writers of similar abilities employ different revising strategies, but individual writers themselves will also employ varied revising strategies as they engage in different writing situations. Faigley and Witte also observe that

The volume and types of revision changes are dependent upon a number of variables besides the skill of the writer. These variables might be called *situational variables* for composing. (410)

As the differences in the revision frequencies across the tables indicate (for all levels and types), the students simply do not compose a paper the same way twice. This is due in part to the time constraints--they had much less time to produce the A4 paper--but it is also due, as Faigley and Witte suggest, to the situational variables. Writers approach an informative essay differently than they approach an argumentative one. But in some cases the processes can be changed radically. The best example of this can be seen in the difference in strategies student six employed in his second and fourth papers. In A2, the student made changes at the meaning level late in the process, in stages 2.2

and 2.3. However, in A4, he made his only meaning change in the first stage, 4.1.

Nancy Sommers (1980)

The results of "Revision Strategies of Student Writers and Experienced Writers."

In "Revision Strategies of Student Writers and Experienced Writers," Sommers analyzed the work of twenty above average college freshmen and twenty expert writers who wrote three essays each in two drafts. Sommers observed that experienced, adult, writers are more likely to add information to or delete information from their texts than are student writers. Adult writers are also more likely to rearrange sentences and paragraphs when they revise. Their revision consisted mostly of additions and rewording. The student writers primarily viewed revision as a "mopping up" process, editing. From the growth of the size of the text (all texts increased in size throughout the process except in one instance when it decreased slightly then increased again), it is apparent that these ESL students revise their texts primarily by adding to them. This may owe to the fact that they, as we noted before, are more aware of their audience, and constantly work their way through their drafts adding more information to make themselves clear to the American reader. Though global changes were not included in this study, the students did often move parts of their texts around to make the paper flow more smoothly; they were more likely to move sentences than paragraphs, however. The ESL students were decidedly not of the inexperienced writer's opinion that revision is a cleaning up process.

CHAPTER VII

CONCLUSIONS AND IMPLICATIONS

In exploring the revision strategies ESL writers employ when working on a word processor, this study attempted to answer four questions. The data gathered reveals that, with the exception of the second research design question, these questions do not, in this study, have "neat" answers. However, even if the answers do not provide conclusive results, they do raise interesting questions. In the discussion that follows, the questions are posed again and the answers discussed.

1. What types of changes do ESL students make in their drafts as they work toward producing a final, polished paper?

Some studies of computer-assisted composition, in response to the observation that computers seem to increase a student's frequency of revisions, looked for relationships between the number of revisions made in a text and the quality of the text. The hypothesis for a while was that the more students revised their papers, the better their papers would be, though this recently has been rejected (see for instance, Boiarsky, 1988). Students must know how to revise and what to revise before they can revise effectively (Puhfal, 1986). At any rate, Faigley and Witte's observation that "Successful revision results not from the number of changes a writer makes but the degree to which revision changes bring a text closer to fitting the demands of the situation" (411), seems especially relevant here. It illustrates that the ESL writers, indeed all writers, make whatever changes they perceive that they need to make. A writer will only makes changes in his text when he or she perceives dissonance in the text between intended meaning and actual communicated meaning (Sommers, 1980). Students who carefully plan their papers before they begin actually writing them will probably not, and not have

to, make as many changes as some one who begins by freewriting (Harris, 1988).

However, as we have noted, some patterns in revision strategies among the students did appear. The students primarily made additions to their texts, clarifying and expanding their ideas in the beginning, editing and polishing near the end. The majority of these changes were on the surface level and smaller lexical levels (words and and phrases) though macrostructure additions to the text at multiple sentence levels were also frequent.

2. How effective, in terms of quality of work are these changes?

The analysis of the effectiveness of the individual changes was basic, the only criteria was that the change improve, though not necessarily significantly, the text on any level. With only a few exceptions, the changes were found to be overwhelmingly effective. Error correction will, of course, improve a text, but these students also made good decisions when it came to altering the text on a meaning level. Indeed, most of the ineffective or indifferent changes were at the surface or word level (substituting synonyms, experimenting with verb tenses) or were awkward attempts to work through difficult phrasings.

3. What influence, if any, does the stage of composing at which the changes are made have on the quality of the text?

In this study no correlation was found between the stage at which the student made the change and the text's quality. Most of the students revised their papers at the surface level (edited) near the end of the process, but this was the pattern established in all of the drafts, regardless of quality. The two best writers in the study, students three and four, differed widely in their approaches to revision. Student three made relatively few revisions in his work and had generally "discovered meaning" in his work before he began transcribing the actual text. Student four, on the other hand, made changes on nearly all levels from the first draft to the final one. Even in her next to last draft she continued to make substantial changes in meaning.

4. *How do these changes differ from the changes made by native students?*

There are differences, of course; it would be surprising if there were not. The differences, however, are not significant. They indicate that ESL students make more formal changes than a native writer, but we have already suggested that this is because they make more mistakes on this level than a native writer.

Another difference between ESL and native writers, and Raimes noted this in her 1987 study as well, is the way in which the ESL writers approach writing tasks. Her students wrote longer essays than the students in Perl's study without being instructed to do so. They also approached the task more seriously than their native peers, perhaps because they took it as a language learning exercise. The students in this study wrote very long papers; the assigned length never approached 1000 words though the students' papers averaged nearly that many. And while this is an unsupported observation, they worked harder on their papers than many native writers, especially college freshmen, might. Since writing in another language is generally more difficult than composing in the native language, the students would be expected to work harder. But the students were not, as Zamel and Raimes both observed, preoccupied with linguistic concerns. Much of the work they put into their papers revealed an attempt to produce reader-based prose. The ESL students' diligence may be accounted for in part by the fact that they are usually very good students. That they took the initiative to learn a foreign language and to study in another country sets them apart from many native writers.

The similarities indicate that native and ESL skilled and unskilled writers approach the composing process in similar ways. Unskilled writers in this study revised like unskilled native writers; both are preoccupied with local problems in their texts from the outset. The skilled writers revised like skilled

native writers, working on meaning early in the process and turning their attention to editing concerns near the end.

These basic similarities suggest that advanced ESL students revise their work in much the same ways as native writers. Since advanced ESL students have studied English long enough to communicate with near fluency in English, it follows that they understand, perhaps passively, the rhetorical structures of English to some extent, and are continuing to learn how to produce written text that conforms to these structures (Kaplan, 1966).

IMPLICATIONS FOR FURTHER RESEARCH

Composition researchers have an important choice to make before they begin their studies of the writing process: they have to decide what they are going to give up. Carol Berkenkotter (1983) observed

The researcher must make a trade-off, foregoing generalizability for the richness of the data and the qualitative insights to be gained from it. We need to replicate naturalistic studies of skilled and unskilled writers before we can begin to infer patterns that will allow us to understand the writing process in all its complexity. (169)

No study the magnitude of Bridwell's case study of 100 students has been done in the ESL field, much less in the area of ESL computer-assisted composition. Clearly a study like this is useful in establishing across-the-board patterns for writers, and yet it is still a limited study done on one class of students in one high school on a single kind of writing assignment. And what does such a large study really tell us about an individual writer? The results of this study, and of Faigley and Witte's and Sommer's studies, indicate that no two writers revise alike. The overall results of this study with ESL writers are very misleading if taken out of context. What was true of the class overall may very well not be the case with an individual student.

The reverse side of this coin raises difficult questions, too. Can a studied population of only six students reveal patterns that would hold true for the much larger community of ESL writers? The variables, writing assignment, writing environment, previous instruction, and so on, are considerable. However, none of the case studies of this nature of ESL writers have exceeded six students at a time. In fact, even in Faigley and Witte's study with native writers, the researchers have established patterns common to all expert adult, advanced student, and inexperienced student writers by observing only six of each.

ESL composition researchers who are interested in the computer-assisted composition behaviors of ESL students have several tasks before them.

If a more accurate pattern of revision strategies in this area is to be developed, the studied populations must be larger than they have been in the past.

In order to discern the specific differences between ESL students who compose on the computer and those who do not, a study like Hawisher's should be set up. An important aspect of Hawisher's research is that each individual student composed essays both on and off the computer, thus controlling for differences between the writers.

Any further research in the area of ESL computer-aided revision should analyze the in-process revisions as well as the ones made between drafts. Bridwell, Hawisher, and Faigley and Witte all reported that the highest frequency of revision occurs at the in-process stages. New programs that record the keystrokes the writer makes, and the pauses between the strokes, could facilitate the study of in-process revisions.

PEDAGOGICAL IMPLICATIONS

Vivian Zamel has been building a case over the last ten years for incorporating native English pedagogies into the ESL composition classroom. There is no need for drills because grammatical and structural lessons are

learned as the student writes, and the students are likely to acquire an appreciation for rhetorical considerations through practice, instruction, and correction.

The most important implication that can be derived from this study is that a student must understand his or her composing process before he or she can begin to improve it. Inexperienced writers tend to think revising a paper is something that has to be done when the writer did not get it right the first time (Murray, 1968). It is important to help students understand that composing is not a matter of simply transcribing information but of creating it, and it is important to teach revision strategies as a means of producing good writing. Faigley and Witte concluded that, "revision cannot be separated from other aspects of composing, especially during that period when writers come to grips with the demands of the particular writing situation" (411).

Zamel asserts that ESL writers must be allowed to experience the composing process as a means to discovering meaning. The advanced ESL student will also benefit if he or she is encouraged to discover his or her own individual composing process. The students should be exposed to many different possibilities for composing so that they can adopt one that works well for them. The students in this study were pleased by the attention their writing attracted and were intrigued by the interview and questionnaire questions. They were interested in discussing their writing habits, and, as we have noted before, their insights by the end of the semester were sophisticated.

PLANS FOR FURTHER STUDY

This exploratory study serves as an introduction to a topic that needs more investigation. It was performed with an awareness of its shortcomings, but also with an understanding that the territory must be scouted before it can be entered. Follow-up studies will attempt to incorporate the suggestions made under Implications for Further Research, and will be more closely associated with the writers and their writing processes.

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APPENDICES

APPENDIX A

TABLES

Table 1

Frequencies of Types of Revision Changes per 1000
Words in Each Draft of Assignment Two

Between-Draft Stage Number	Number of Words	Formal Changes	Meaning- Preserving	Microstructure Changes	Macrostructure Changes	Total Revisions	
1	2.1	824	4.85	8.5	1.21	0	14.56
	2.2	724	8.29	9.67	19.34	0	37.30
	2.3	1026	41.91	40.94	23.39	11.70	117.94
2	2.1	1247	10.43	12.03	12.83	0	35.28
	2.2	1324	3.02	2.27	3.78	0	9.06
	2.3	1457	25.39	35.69	2.06	1.37	64.52
3	2.1	807	0	0	0	0	0
	2.2	1152	5.21	1.74	1.74	2.6	11.28
	2.3	1607	18.05	21.78	1.24	0	41.07
4	2.1	511	0	11.74	15.66	17.61	45.01
	2.2	768	10.42	20.83	10.41	11.72	53.39
	2.3	918	18.52	32.68	10.89	11.98	74.07
5	2.1	819	9.77	6.11	15.87	9.77	41.51
	2.2	854	4.68	4.68	1.17	0	10.54
	2.3	992	11.09	46.37	19.15	7.06	83.67
6	2.1	1144	21.85	0	0	0	21.85
	2.2	1430	11.19	12.59	11.19	4.9	39.86
	2.3	1408	30.54	47.59	14.20	5.68	98.01
Overall	19012	14.41	18.67	8.52	4	45.6	

Table 2

Frequencies of Levels of Revision Changes per 1000
Words for Assignment 2

Between-Draft Stage Number	Formal Changes	Word Level	Phrase Level	Clause Level	Sentence Level	Multiple Sentences
1						
2.1	4.85	6.07	0	2.43	1.21	0
2.2	8.29	8.28	4.14	1.38	4.14	11.05
2.3	41.91	10.72	13.65	5.85	15.59	30.21
2						
2.1	10.43	8.02	4.81	2.41	4.81	4.81
2.2	3.02	.75	.75	1.51	.75	2.27
2.3	25.39	19.22	10.3	2.75	3.43	3.43
3						
2.1	807	0	0	0	0	0
2.2	5.21	.87	0	1.74	.87	2.6
2.3	18.05	18.67	3.73	.62	0	0
4						
2.1	0	1.96	1.96	5.87	3.91	31.31
2.2	10.42	14.32	3.91	5.21	3.91	15.63
2.3	18.52	25.05	8.71	9.8	5.45	6.54
5						
2.1	9.77	2.44	3.66	0	4.88	20.76
2.2	4.68	1.17	1.17	0	3.51	0
2.3	11.09	19.15	7.06	6.05	9.07	31.25
6						
2.1	21.85	0	0	0	0	0
2.2	11.19	5.59	3.5	2.8	2.8	13.99
2.3	30.54	27.7	14.2	1.42	7.1	17.05
Overall	14.41	10.31	4.89	2.58	3.84	9.57

Table 3

Percentages of Operation Changes for Total Revisions
for Each Draft of Assignment Two

Stages	Additions	Deletions	Substitutions	Permutations	Distributions	Consolidations
1						
2.1	8%	8%	33%	17%	0	0
2.2	4%	44%	19%	7%	0	4%
2.3	36%	7%	11%	7%	.8%	3%
2						
2.1	30%	11%	25%	2%	0	2%
2.2	50%	4%	4%	0	0	0
2.3	22%	5%	26%	4%	3%	0
3						
2.1	0	0	0	0	0	0
2.2	54%	0	0	0	0	0
2.3	12%	9%	33%	0	0	2%
4						
2.1	26%	61%	0	13%	0	0
2.2	56%	3%	15%	5%	3%	0
2.3	31%	7%	29%	3%	0	4%
5						
2.1	56%	3%	3%	15%	0	0
2.2	44%	0	1%	0	0	0
2.3	28%	19%	24%	6%	8%	1%
6						
2.1	0	0	0	0	0	0
2.2	35%	4%	11%	4%	14%	5%
2.3	24%	15%	17%	5%	2%	6%
Overall	29%	11%	18%	5%	3%	3%

Table 4

Percentages of Effectiveness in Total Revisions
of Each Draft of Assignment Two

Between-Draft Stage Number	Number of Words	Total Revisions	% Effective Changes	% Indifferent Changes	% Ineffective Changes
1 2.1	824	12	75%	25%	0
2.2	724	27	48%	26%	26%
2.3	1026	121	94%	4%	2%
2 2.1	124	44	66%	30%	5%
2.2	1324	12	66%	33%	0
2.3	1457	94	80%	16%	4%
3 2.1	807	0	0	0	0
2.2	1152	13	92%	8%	0
2.3	1607	66	79%	17%	5%
4 2.1	511	23	39%	61%	0
2.2	768	41	89%	5%	7%
2.3	918	68	87%	9%	4%
5 2.1	819	34	85%	15%	0
2.2	854	9	89%	11%	0
2.3	992	83	84%	11%	5%
6 2.1	1144	25	100%	0	0
2.2	1430	57	96%	2%	2%
2.3	1408	138	86%	11%	3%
Overall	7408	867	83%	13%	4%

Table 5
Frequencies of Types of Revision Changes per 1000
Words in Each Draft of Assignment Four

Between-Draft Stage Number	Number of Words	Formal Changes	Meaning- Preserving	Microstructure Changes	Macrostructure Changes	Total Revisions
1	4.1	851	0	0	0	0
	4.2	1049	11.44	45.76	0	69.59
2	4.1	775	10.32	19.35	11.61	52.9
	4.2	923	9.75	15.17	7.58	40.07
3	4.1	919	3.25	8.12	5.68	17.05
	4.2	1232	22.85	37.0	14.15	80.52
4	4.1	578	3.46	12.11	12.11	46.71
	4.2	803	18.68	24.91	16.19	63.51
5	4.1	817	23.35	23.25	15.91	62.42
	4.2	881	12.49	19.3	17.03	49.94
6	4.1	920	8.7	2.17	1.09	11.96
	4.2	954	10.48	11.53	0	22.01
Overall	10702	11.12	18.41	8.22	4.39	42.14

Table 6
Frequencies of Levels of Revision Changes per 1000
Words in Each Draft of Assignment Four

Between-Draft Stage Number	Formal Changes	Word Level	Phrase Level	Clause Level	Sentence Level	Multiple Sentence
1 4.1	0	0	0	0	0	0
4.2	11.44	32.41	5.72	3.81	6.67	9.53
2 4.1	10.32	9.03	5.16	5.16	6.45	16.77
4.2	9.75	8.67	5.42	4.33	1.08	10.83
3 4.1	3.25	4.06	.81	2.44	1.62	4.87
4.2	22.85	20.67	10.88	2.18	8.71	15.23
4 4.1	3.46	8.65	6.92	0	5.19	22.49
4.2	18.68	21.17	4.98	1.25	6.23	11.21
5 4.1	23.35	12.24	8.57	4.9	7.34	6.12
4.2	12.49	14.76	4.54	9.08	3.41	5.68
6 4.1	8.7	1.09	1.09	1.09	0	0
4.2	10.48	7.33	0	0	4.19	0
Overall	11.12	11.68	4.39	2.9	4.11	7.94

Table 7
Percentages of Operation Changes for Total Revisions
for Each Draft of Assignment Four

Stages	Additions	Deletions	Substitutions	Permutations	Distributions	Consolidations
1 4.1	0	0	0	0	0	0
4.2	34%	10%	26%	8%	1%	4%
2 4.1	17%	34%	20%	5%	0	5%
4.2	41%	11%	22%	3%	0	0
3 4.1	57%	5%	14%	0	5%	0
4.2	38%	14%	20%	5%	4%	3%
4 4.1	63%	4%	4%	22%	0	0
4.2	47%	4%	16%	4%	0	0
5 4.1	18%	14%	23%	4%	0	6%
4.2	27%	11%	25%	0	2%	9%
6 4.1	18%	0	9%	0	0	0
4.2	10%	14%	19%	5%	0	5%
Overall	34%	10%	20%	5%	1%	3%

Table 8
Percentages of Effectiveness for Total Revisions
for Each Draft of Assignment Four

Between-Draft Stage Number	Number of Words	Total Revisions	% Effective Changes	% Indifferent Changes	% Ineffective Changes
1 4.1	851	0	0	0	0
4.2	1049	73	99%	1%	0
2 4.1	775	41	88%	12%	0
4.2	923	37	92%	5%	3%
3 4.1	919	21	100%	0	0
4.2	1232	74	86%	11%	3%
4 4.1	578	27	89%	7%	4%
4.2	803	51	80%	18%	2%
5 4.1	817	51	90%	6%	4%
4.2	881	44	82%	18%	0%
6 4.1	920	11	82%	0	18%
4.2	954	21	100%	0	0
Overall	7408	451	91%	8%	2%

APPENDIX B
QUESTIONNAIRE

1. In this school year (beginning in August) how many papers have you written?
a. 1-3 b. 4-7 c. 8-11 d. 12 or more
2. How many of the above papers were long papers (3 or more typed pages)?
a. 0 b. 1-3 c. 4-7 d. 8 or more
3. How many total hours (estimate) do you usually spend working on a paper of 500-750 words?
a. under 1 hour c. 2-4 hours e. more than 6 hours
b. 1-2 hours d. 4-6 hours
4. Do you compose your papers in English or do you compose in your native language then translate into English?
a. compose in English b. compose in native language
5. What do you worry about most when you write a paper?
a. finding a topic e. thinking of enough to say
b. getting started f. making your ideas or arguments
c. organizing the paper clear to your reader
d. grammar, spelling, and/or punctuation g. finishing by the deadline
h. grades
6. How would you rate your writing skills (in English) presently?
a. high d. poor
b. better than average e. very weak
c. fair

DO YOU FEEL THAT YOU...

7. write well-formed sentences?
a. yes b. no
8. are a good speller?
a. yes b. no
9. know most of the important rules of grammar?
a. yes b. no
10. have good, easily read, handwriting?
a. yes b. no

11. What part or parts of the writing process are the most difficult?
 - a. planning the paper
 - b. writing the first drafts
 - c. revising
 - d. proofreading
 - e. improving sentences
 - f. improving word choice

12. What do you feel are your major strengths as a writer? (You may circle more than one.)
 - a. research skills
 - b. vocabulary
 - c. sentence structure
 - d. grammar and punctuation
 - e. spelling
 - f. well-read
 - g. sensitive to audience
 - h. good organization of ideas

13. What area do you feel you need the most help in?
 - a. research skills
 - b. vocabulary
 - c. sentence structure
 - d. grammar and punctuation
 - e. spelling
 - f. becoming better read
 - g. becoming more sensitive to audience
 - h. learning to organize papers better

14. Which references do you use when you write?
 - a. English dictionary
 - b. English-Native Language dictionary
 - c. grammar handbook
 - d. thesaurus
 - e. style manuals
 - f. none

15. Where do you prefer to work on your papers?
 - a. own room or apartment
 - b. in the library
 - c. in the computer lab
 - d. in a public place
 - e. other (please specify) _____

16. When do you prefer to write?
 - a. morning
 - b. afternoon
 - c. evening, night
 - d. very late, after midnight

17. Are you more comfortable writing your papers out by hand or writing them on a word processor?
 - a. by hand
 - b. using the word processor

18. Is this the first time you have ever ~~used~~ a computer to write compositions (not just to run programs)?
 - a. yes
 - b. no

19. If no, how long have you been writing on a word processor?
 - a. less than 1 year
 - b. 1-2 years
 - c. 3-4 years
 - d. more than 4 years

20. Do you write your papers out by hand before you put them into the computer, or do you compose directly into the computer?
a. write papers out by hand b. compose directly into computer
21. If you actually compose on the computer, do you use notes that you have written out?
a. yes b. no
22. Do you print out copies of your paper to make changes, or do you do make most of your changes on the computer screen?
a. print copies b. work with text on screen
23. Is it easier or more difficult for you to write papers using a word processor?
a. easier b. more difficult
24. If you answered **b**, why do you think it is more difficult to compose on word processors?
a. lab noisy or uncomfortable
b. lab full or not open when you want to work
c. don't type very well
d. difficult to remember what you have written because you can't see the whole text at once
e. other _____
25. If you had a choice between taking this class, in which you use word processors, or a regular 131 class in which you would write using pen and paper, which would you choose?
a. the class with word processors b. the pen & paper class
26. Do you consider knowing how to compose papers on word processors an advantage for writing in college?
a. yes b. no
27. Will you continue to write your papers on word processors even after this class?
a. yes b. no

CHOOSE THE SENTENCE THAT BEST DESCRIBES YOU.

28. When I write a paper, I
a. work from a mental outline or list of points.
b. work from a written outline or list of points.
c. brainstorm or freewrite, just try to get my thoughts down as quickly as possible.
d. simply begin writing the paper, starting with the first sentence.

29. When I am writing a paper and I think of things to add, I
- drop the point I am working on and work out the new idea.
 - write the thought down quickly so I don't forget the new idea, and then I go on.
 - go on so I do not lose my train of thought.
30. When I am writing a paper, I usually stop and read back over what I have written when
- I finish a sentence.
 - I finish a paragraph.
 - I finish a major point.
 - I get stuck.
31. When I am writing a paper, I
- try to write the whole paper in one sitting, working on errors I make only after I have completed the paper.
 - try to correct each error as I make it.
 - change the text frequently even as I am writing it.
32. When I read over a classmate's paper, as in the peer-editing sessions, the things I look for most are
- grammar, punctuation, and spelling mistakes.
 - good ideas and poor ideas.
 - faulty arguments or poorly organized sections of the paper.
 - coherence.
33. When I revise my own papers, I
- check over the paper to see if I have left anything out.
 - use the dictionary to check words I am not sure of and/or I read very closely for grammatical mistakes and punctuation.
 - work with the sentences and words to get them exactly right.
 - do a lot of cutting and adding, moving sentences and paragraphs around, adding new material to some places and cutting it from others.
34. When I work on word processors, I find that
- I make more changes in my text than when I write my papers out by hand.
 - it is easier for me to spot errors in my papers.
 - I write longer papers.
 - I write better papers.
 - my papers are basically the same length and quality as when I compose without a word processor.

35. In this class you have been asked to turn in multiple drafts of each paper. Do you make multiple drafts for your papers outside of the ones you write in here?
- a. No. I usually turn in the first draft I write.
 - b. Yes. I usually make one draft before I write a final version.
 - c. Yes. I usually make more than one draft of each paper I write.
36. When a paper is returned with comments,
- a. I usually ignore the comments; only the grade matters.
 - b. I read the comments (or listen carefully) to try to understand how it relates to my grade
 - c. I read the comments and try to keep them in mind when I write the next paper.
 - d. I read the comments to find out how the reader has reacted to my ideas or arguments.
37. When I receive negative comments on my writing
- a. I am embarrassed to have done faulty work.
 - b. I usually dismiss the comments, telling myself that the reader didn't understand what I was trying to do.
 - c. I get angry.
 - d. I feel disgusted with the paper and don't want to look at it again.
 - e. I try to figure out what caused the reader to make the comments.
38. For me, the most difficult part of writing in English is
- a. the grammar and punctuation.
 - b. presenting my ideas clearly.
 - c. organizing my paper so that my points are in a logical order.
 - d. deciding how I should present my ideas and arguments so that they can be understood by an American reader.
39. When writing papers in English, I make an effort to
- a. write different from the way I speak.
 - b. try to think more like a native speaker of English thinks.
 - c. make my punctuation, grammar, and spelling precise.
 - d. retain the writing style that works best for me. As long as I understand my topic very well, my reader will be able to understand it, too.

40. When I am working on a new draft of my paper, I
- a. mostly work on expanding my ideas.
 - b. check to be sure that a native speaker of English could follow my ideas.
 - c. work out all of the grammar and punctuation problems.
41. If I think that my paper needs improvement, I
- a. move entire paragraphs around.
 - b. work on my sentences, sometimes changing the length and the word order.
 - c. go through my paper to check for words I could replace with better words.
 - d. start over.

VITA

Regina Dragoin was born in Opelika, Alabama, on November 17, 1964. She attended elementary schools in the Auburn, Alabama, area and in Nashville, Tennessee. In June, 1983, she graduated from Americus High School in Americus, Georgia. The following September she entered The University of Georgia in Athens, and in June of 1987 she received a Bachelor of the Arts degree in English. In the fall of 1987 she accepted a teaching assistantship at The University of Tennessee, Knoxville, and began study toward a Master's degree.

The author is a member of Phi Beta Kappa, Phi Kappa Phi, and Omicron Delta Kappa. Ms. Dragoin will be employed as an English instructor in Kagoshima, Japan, upon graduation.