

Revision: Research, Theory, and Pedagogy

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## Introduction

Revision conjures up myriad associations in the minds of writing teachers. One teacher may think of Tom, a student who revised a descriptive paper about his father at least five times and still only minimally improved it. Or another teacher may remember Susan, who was able to take a brief comment at the end of her interpretation of a piece of art and revise her paper into an outstanding essay. Still another may think of Dennis, a student in remedial writing who struggled to revise his final drafts for complete sentences, much less write coherent, organized paragraphs.

Whatever the associations, revision has become both a theoretical and pedagogical concern to those in the writing profession interested in the development and improvement of writing skills. Since the late 1970's, research in revision has both generated and reflected this interest. Theorists and researchers have attempted to answer some of the following questions: What is the nature of revision? When and how do writers revise? What kinds of revisions do they make? How can these revisions be categorized? What are the differences between skilled and unskilled revisers in their conception and use of revision as reflected in their writing process and product? How can the process or skill of revision be modeled? The ultimate purpose of answering these questions, of course, is to develop an empirical basis for both revision theory and classroom practice. The purpose of this report is to analyze early research in revision and the factors influencing its theoretical orientation, to discuss how theoretical conceptions of revision have changed since the development of more sophisticated models of the writing process based upon empirical research, to present a workable model of

revision based on more recent research in revision, and lastly, to discuss the pedagogical implications of this research.

### **Early Research In Revision**

Most "early" research related to revision was reported in the 1970's, beginning with studies of students' writing processes such as Janet Emig's The Composing Process of Twelfth Graders (1971) and Charles Stallard's study of "good student writers" (1974). Although serious composition research got off the ground in the early sixties, serious research in revision was inhibited by the traditional view of revision as copy-editing, a view associated with a product-oriented conception of rhetoric which has dominated composition instruction for the past one hundred years. In this theory of rhetoric,

the chief problem in writing well is choosing language, syntax, and organizational patterns that are consistent with the practice of 'educated people,' those whose speech and writing define 'good English.' This practice, supposedly distinguished by such characteristics as correctness, conciseness, and clarity, is appropriate for every situation in which one is 'writing carefully' . . . By and large, the writer's chief purpose is to present information and ideas in a clear, orderly fashion to an audience that, so far as we can determine, has no emotional investment in either the writer of the piece or in the subject being discussed (Odell, Cooper, and Courts 1).

In Rhetoric and Reality: Writing Instruction in American Colleges, 1900-1985, James Berlin calls this traditional view of rhetoric the "current-traditional rhetoric" (7),

with its primary instructional emphases on the traditional modes of discourse (description, narration, exposition, argument), logical patterns of arrangement, and superficial correctness in mechanics and usage. This current-traditional rhetoric is the dominant form of what Berlin calls "objective" (7) rhetorics, rhetorics which are based on a positivistic epistemology that locates reality in the material world and views language as a sign system which is "at worst a distorting medium . . . and at best a transparent device" (8) for communicating this reality. The writer's job, then, in these rhetorics, is to correctly and accurately record reality. Because reality, or truth, is considered to be pre-existent, its discovery is taken for granted; therefore invention (a method of discovering truth) is not included in these rhetorics. Consequently, the scope of revision is limited to copy-editing.

Berlin also discusses the theories of rhetoric competing with the current-traditional rhetoric. "Subjective" (11) rhetorics locate reality or truth within the individual, to be privately discovered and communicated. Such rhetorics give more room to invention as a method of discovering truth, and revision as a way of "re-viewing" this discovery. "Transactional" (15) rhetorics locate reality in the interaction of writer, world, audience, and language. Because reality is a function of this interaction and constantly changes, revision in these rhetorics can also encompass more than mere copy-editing. However, despite the presence of these competing rhetorics, the current-traditional rhetoric, for historical reasons, dominated composition theory and instruction for most of this century. In the nineteenth century, as the language of learning shifted from Latin and Greek to English, English departments were originally

established to provide instruction in writing. Most entering university freshmen, regardless of their high school background, were thought not to possess adequate writing skills for the amount and kind of academic writing they were required to do, a belief reflected in the Harvard Reports of the late 1800's (Stewart 48). Therefore, students took up to three years of writing courses to continue developing their skills (Berlin 20). The rhetoric taught was that of rigid adherence to prescribed modes and rules of writing, as epitomized by A. S. Hill's popular Principles of Rhetoric and Their Application, which was Harvard's required text for more than thirty years after its publication in 1878 (Stewart 50). In response to the perceived inadequacy of the writing skills of incoming college freshmen, many universities, beginning with Harvard, established entrance exams in English based on a standard reading list, and their emphases on conformity to standard usage further entrenched the traditional rhetoric in the high schools. Even today, the SAT's Test of Standard English continues to influence high school composition instruction in this direction.

Furthermore, the teaching of writing came to be devalued as English literary scholars began to resent the demands of correcting compositions. At Harvard, literature professors with seniority were exempted from composition duties (Berlin 23), which contributed to the development of the view that teaching composition is the "dirty work" of English departments, the work that should have been done by high school teachers. By the mid-1900's, surveys indicated that most composition courses were taught by instructors and graduate students (Berlin 63), a fact which reflected the de-professionalization of the field. Eventually, college writing requirements were reduced

to two one-semester courses in most universities, and even until the 1970's, an occasional article called for the abolition of required writing courses at the college level altogether. So despite the existence of competing theories of rhetoric influencing composition instruction, it was not until the "Renaissance of Rhetoric" (Berlin 120) in the 1960's, with its corresponding professionalization of the field of composition studies, that these competing theories significantly influenced composition research and pedagogy.

Rohman and Wlecke's (1964) stage model of the composing process--pre-writing, writing, rewriting--helped change the orientation of composition theory and pedagogy in the direction of a process approach, rather than the traditional product approach with its attendant emphasis on mechanical correctness. Their work also helped focus more attention on revision, or rewriting in this case, as an element of composing. James Britton, et al., in The Development of Writing Abilities (11-18), adopted a similar writing model with different terminology--conception, incubation, and production--and Donald Murray's (1978) model of prevision, vision, and revision echoed the same idea. However, as Stephen Witte has observed, regardless of the terminology, this model of composing was "compatible with the complementary traditions of product-oriented writing and assessment" (1985, 257) because it presented a linear model of the stages in the development of the written product, rather than a model of the composing process itself, which is recursive, or non-linear, in nature. In other words, writers may plan, write, and revise at any time during composing. While the stage model of composing may be useful as an organizational structure for composition textbooks, which because of



their linear nature can only focus on writing processes one at a time, it fosters a somewhat limiting view of revision as "the manipulation and alteration of features in written texts" (Witte 1985, 258).

The stage model of composing, because of its linear nature, values revision as a necessary and final step in the writing process by implying that a competent writer will successfully complete each stage, from pre-writing through revision, to produce successful writing. Charles Stallard's early study of the writing behavior of good student writers seemed to support this view. His fifteen good writers, as compared to fifteen student writers selected at random, spent more time writing and made both a greater number of revisions and more substantial revisions (1974, 211). This belief in the efficacy of revision has also been enhanced by what Witte terms the "professional" (1985, 254) view of revision, that good writers revise more. Donald Murray is the most eloquent spokesman for this view, asserting that "writing is rewriting" and that "rewriting is the difference between the dilettante and the artist; the amateur and the professional, the unpublished and the published" (1978, 85). This distinction between the amateur and the professional in terms of revision has contributed to an emphasis on revision as beneficial for its sake alone.

This assumption that "more is better" underlies Richard Beach's study of the "Self-Evaluation Strategies of Extensive Revisers and Nonrevisers" (1976). Evaluators rated twenty-six college juniors and seniors as either extensive revisers or nonrevisers on the basis of the degree of change to two essays. Through an analysis of their drafts and taped self-evaluations, Beach inferred that the extensive revisers and nonrevisers

differed in terms of their attitudes toward revision and their comprehension and conception of their own texts. As would be expected, extensive revisers saw revision as an opportunity to clarify and reformulate their initial drafts, while the nonrevisers viewed revision as primarily surface editing. Also, extensive revisers seemed more able to detach themselves from their texts, make generalizations, and predict necessary changes for subsequent drafts. The nonrevisers, in contrast, seemed more egocentric and were less able to make generalizations about their writing and use this information for later drafts. Beach's study, one of the first to focus solely on revision, raises some interesting questions. First, to what degree does instruction in revision, as either an opportunity for extensive recasting or minor editing, influence the ways in which students revise? Secondly, is the ability to "conceive of the paper in holistic terms" (162) and make corresponding generalizations about its content a prerequisite for extensive revision? The most important question, however, is whether or not Beach's extensive revisers produced qualitatively better drafts. This question can not be answered by Beach's study because quality ratings were not incorporated in his research method.

After conducting a study with her own classes, Barbara Hansen claimed that "Rewriting Is a Waste of Time" (1979). Out of forty-nine students, those who only corrected their compositions and those who rewrote their compositions showed no significant differences in gain in composition skills after one semester's instruction. However, because she taught revision skills through discussion to the control group that was to be taught revision only as proofreading, Hansen's results may not truly reflect

the value of instruction related to revision. Also, students wrote their essays in class, which may have limited the potential positive effects of revision. However, her study, like Beach's, raises the same question regarding the effect of instruction on the type of revision students will perform. If students see revision as correction, then it is conceivable that mere rewriting would not substantially improve students' quality of writing or affect mean differences in improvement of composition skills.

Beach and Hansen's studies, like most early studies related to revision, share the assumption that revision is retranscription or rewriting. Consequently, the focus of revision research in the 1970's and early 1980's was on "the effects of revising on written texts" (Witte 1985, 25), which produced studies describing the revisions of student writers, the differences in revisions between skilled and unskilled writers, and taxonomies of types of revision. In its writing report Write/Rewrite: An Assessment of Revision Skills, the National Assessment of Educational Progress analyzed the revisions of nine-, thirteen-, and seventeen-year-olds on the basis of nine categories ranging from cosmetic changes "in the appearance of legibility" (9) to holistic changes, which constituted "a radical departure from the overall approach taken in the original reports" (11). The study found that most student revisions were concentrated in the areas of stylistic (substituting a word, phrase, or sentence for another without changing meaning), informational (adding or deleting information), and mechanical revisions (changing spelling, punctuation, etc.). Their taxonomy of revisions, however, is problematic not only because the categories are neither mutually exclusive nor exhaustive, but also because the categories are not differentiated by consistent criteria.

Furthermore, because the seventeen-year-olds were given a different writing task than the nine- or thirteen-year-olds, the study's findings cannot be considered conclusive. However, in general the study confirmed Stallard's observation that even good student writers revise primarily at the surface or lexical level (1974, 213) and Sondra Perl's finding that unskilled college writers viewed revision as "an exercise in error-hunting" (1979, 233). The NAEP reported that "a working definition of revision for many students seems to be substituting more appropriate words or phrases for preliminary attempts in the first draft, adding relevant and deleting irrelevant information, and attending to capitalization, punctuation, and other mechanical conventions" (27). The question of whether or not this conception of revision is a result of classroom pedagogy or of limitations in students' abilities to revise substantially on the semantic level is outside the scope of the NAEP study.

In a survey of 248 freshman writers in twenty-two composition classes taken in the fall of 1979, Susan Wall and Anthony R. Petrosky attempted to address the issue of whether students limited revisions are due to their lack of ability to revise or to inadequate instruction. While admitting that a "self-report" (110) is somewhat biased, they found that 70% of these freshmen "were seldom or never required to do any other kind of revision besides correcting errors" and "seldom or never met with their teachers in conference or even submitted a working draft for reaction and advice" (112). If representative of university freshmen in general, this finding indicates that the revision practices observed in student writers may reflect their instruction related to revision. In other words, students may be merely practicing what they have been

taught--that revision is careful editing. Given the continued influence of traditional writing pedagogy at the high-school level, this is not surprising. In a study of the composing processes of seventeen remedial and traditional (average or better) writers, Sharon Pianko noted that none of her subjects attempted any major revisions (1979, 10). Based on her observations and attitudinal interviews of these writers, she attributed this fact to students' lack of commitment to school-sponsored writing, which students saw as "something to be carried out as quickly and as superficially as possible" (12). Thus, students' lack of substantial revisions to their written texts may be influenced by their instruction and their attitudes toward writing, as well as their individual abilities to perform such revisions.

Nancy Sommers focused on the influence of these differing writing abilities in her study of the "Revision Strategies of Student Writers and Experienced Adult Writers" (1980). Twenty college freshman writers (SAT verbal 450-600) and twenty experienced writers, including journalists, editors, and academics, wrote three essays and revised each essay twice, producing a total of nine drafts per writer as a data base. Like the NAEP study, Sommers used a hierarchical taxonomy to classify textual revisions on the basis of operation--deletion, substitution, addition, reordering--and level--word, phrase, sentence, theme (380). While not exhaustive and not differentiating between lexical (form) or semantic (meaning) revisions, this taxonomy, as compared to the NAEP categories, gave a better indication of the kinds and complexities of textual revisions. On the basis of personal interviews with her subjects and her analysis of their drafts, Sommers concluded that the two groups of writers

differed not only in the kinds of revisions they made but also in their conceptions of revision. The inexperienced freshman writers viewed revision as a rewording activity whose aim is to "clean up speech" (381). Because they tended to assume that "the meaning to be communicated is already there, already finished, already produced, ready to be communicated" (382), their revisions reflected a concern for correctness. The experienced writers, in contrast, saw revision as an opportunity to find "the form or shape of their argument" (384), and they made revisions at all levels. In their concern for meaning and audience, experienced writers' revisions indicated their understanding of the priority of situational demands and constraints over the need for mechanical correctness. Interestingly, in contrast to Panko's assertion that students resent having to expend effort for school-sponsored writing, Sommers noted that the inexperienced writers were not unwilling to revise, but rather they had "been taught to do so in a consistently narrow and predictable way" (383). The inexperienced writers did not seem to possess the necessary skills to handle their texts on a holistic basis, a finding which could be attributable to lack of instruction and practice or to inadequate cognitive abilities.

Because she did not provide ratings of quality for the essays produced by her subjects, Sommers assumed that the experienced writers produced better essays with revision than the inexperienced writers, an assumption that was probably safe to make. In a well-designed study of high school seniors' revision strategies, however, Lillian Bridwell (1980) focused more directly on the relationship between revision and quality. One hundred twelfth graders were given a class period to write an essay

describing a place and another class period to revise their initial drafts. Independent evaluators rated the initial and final drafts using Diedrich's Analytic Quality Scale and categorized the types of revisions the subjects made. Bridwell's classification of the textual revisions of her subjects was similar to that of Sommers, though more comprehensive, and ranged from surface-level changes to text-level changes, with an implied increase in semantic change the higher the level of revision. Bridwell found that the second drafts were both longer and better than the first drafts (206-7), that "surface and word level revisions accounted for over half [57%] of the revisions the students made" (207), and that students made more high-level revisions the more time they had to complete the assignment. The most interesting finding, however, was that one of the least revised papers received high quality ratings and that "the most extensively revised papers . . . received a range of quality ratings from the top to the bottom of the scale" (216). This finding calls into serious question the assumption associated with the "professional" view of revision that writers who do not extensively revise their drafts are less competent than those who do. While the ability to revise a written text may be an important writing skill, it is not necessarily a prerequisite for student writers to produce high-quality first drafts.

Lester Faigley and Stephen Witte (1981, 1984) published the most recent study presenting a revision taxonomy and analyzing the revisions of writers of differing abilities. Their classification scheme, the most robust to date, is presented in Figure 1. As Figure 1 illustrates, this taxonomy differentiates between revisions which change a text's meaning and those that do not. Surface changes "do not bring new information to a text or remove old information" (402), while text-base (or semantic) changes "involve

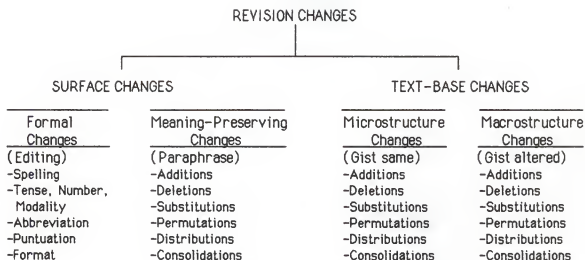


Figure 1. Faigley and Witte's Taxonomy of Revision Changes (1981, 403).

the adding of new content or the deletion of existing content" (402). Surface changes are further subdivided into formal changes (called surface or mechanical revisions in other taxonomies) and meaning-preserving changes, "changes that 'paraphrase' the concepts but do not alter them" (403). Text-base changes at the microstructure level involve changes in meaning that "would not affect a summary of a text" (405), while text-base changes at the macrostructure level would alter such a summary, and represent a "major revision change" (404). The six subcategories under meaning-preserving changes, microstructure changes, and macrostructure changes are a more exhaustive variation of the familiar categories of addition, deletion, substitution, and reordering used in previous studies. By noting that these types of operations may involve either relatively insignificant or rather substantial changes to the meaning and quality of a text, Faigley and Witte's taxonomy better identifies the complexities of revision and is more exhaustive than earlier taxonomies of textual revisions.



Using their taxonomy developed and modified from actual writers' revisions, Faigley and Witte collected and compared the revisions of six inexperienced student writers, six advanced student writers, and six expert adult writers, assuming that the writers represented increasing levels of ability. They found that the inexperienced writers made mostly surface changes (407) and, interestingly enough, that the expert adults made fewer revisions than the advanced students (409), another finding which belies the assumption that better writers necessarily revise their written texts more extensively. When the expert adults were asked to revise the inexperienced students' essays, their revisions indicated that "expert writers revise in ways different from inexperienced writers" (410), especially in that they made more changes at the macrostructure level.

In their conclusion, Faigley and Witte addressed the questions raised by earlier studies in relation to the factors influencing the revisions that writers make:

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. Included among situational variables are probably the following: the reason why the text is being written, the format, the medium, the genre, the writer's familiarity with the writing task, the writer's familiarity with the subject, the writer's familiarity with the audience, the projected level of formality, and the length of the task and the projected text. So important are these variables that writing skill might be defined in part as the ability to respond to them (410-11).

Additionally, writers' conceptions of revision will also affect their revision practices.

Thus, while they can describe general outward tendencies, product-oriented, behavioristic revision studies can only begin to illustrate the factors influencing a writer's performance.

In summary, then, early studies related to revision found that writers of varying abilities differed in terms of their conceptions of revision, their abilities to revise, and the amount and kind of revisions they made. Because their theoretical orientation was determined to a great extent by a traditional view of revision as a series of changes to a written text, these studies emphasized the classification and analysis of different types of textual revision. During this period, however, composition theorists and researchers expressed an increasing dissatisfaction with this product-oriented approach, an approach which focused on writers' performance at the expense of underlying cognitive processes influencing revision. This dissatisfaction was mirrored in the growing realization of the recursive nature of both composing and revision.

### **Changing Perceptions of Composing and Revision**

Nancy Sommers, in her 1979 article discussing "The Need for Theory in Composition Research," identified some of the inadequacies of a stage model of composing:

... it seems neither useful nor accurate to describe composing only as a linear sequence of stages. It's probably true that any observable behavior such as composing must unfold linearly over time, but in as much as we are able to see significant recurring patterns in a linear sequence of events, we can hypothesize that the composing process is both linear and recursive. Thus, it is possible to view the composing process not just as a linear series of stages but rather as a

hierarchical set of sub-processes. (47)

Sommers asserted that the problem with a linear model of composing is that it fosters conceptions of revision as a last step before handing in a paper, and, more importantly, it artificially separates revision from other processes in composing, such as planning and comprehending (48). In her 1980 study, Sommers defined the revision process as "a sequence of changes in composition--changes which are initiated by cues and occur continually throughout the writing of a work" (380). Later, she defined revision as "making a text congruent with a writer's changing intentions" (1981, 42). While Sommers' definitions of revision or the revision process were still text-based, her ideas reflected a significant change in orientation in that they focused attention on the sub-processes involved in revision. Her definitions broadened the scope of revision and linked it particularly to the sub-processes of evaluation and planning.

Sommers recursive definition of revision fit well into Sandra Per1's description of the recursive nature of composing as a type of "retrospective restructuring" in which "movement forward occurs only after one has reached back, which in turn occurs only after one has some sense of where one wants to go. Both aspects, the reaching back and the sensing forward, have a clarifying effect" (1979, 331). Per1 found this recursiveness to be reflected in the fact that writers continually reread their texts and return to their topical plans in the act of composing (1980, 364). Per1 further described a complementary activity of composing as "projective structuring . . . the ability to craft what one intends to say so that it is intelligible to others" (1980, 368). The process of retrospective structuring is governed by the writer, or the writer's "felt

sense" (365), while the process of projective structuring is controlled by the imagined reader's response. In Perl's view, composing could be viewed as consisting of complementary processes which form "the alternating mental postures writers assume as they move through the act of composing" (1980, 369).

This dichotomy between writing to discover meaning and form and then writing to make this meaning accessible to an audience was echoed in the work of Donald Murray, Ellen Nold, and Linda Flower. In his discussion of revision, Murray (1978) differentiated between internal revision and external revision. Internal revision is "everything writers do to discover and develop what they have to say, beginning with the reading of a completed first draft . . . The audience is one person: the writer" (91). External revision is "what writers do to communicate what they have found they have written to another audience" (91). Similarly, Ellen Nold differentiated between revising to fit intentions (internal revision) and revising to fit conventions (external revision) (1982b, 18). In Linda Flower's terms, internal revision would result in "writer-based prose . . . [which] reflects the interior monologue of a writer thinking and talking to himself . . . [and] is inadequate for the reader, but easier for the writer" (1981, 63). External revision would transform this writer-based prose into reader-based prose, which takes into account the writer's audience. The problem with this dichotomy is that it was based on a view of the composing process in which writers purportedly discover "content, form and structure, language, and voice" (Murray 1978, 93-94) without considering purpose or audience. Interestingly, Carol Berkenkotter, in an in-depth study of Donald Murray's composing processes, found that contrary to

Murray's assertions, his "most substantive changes, what he calls 'internal revision,' occurred as he turned his thoughts toward his audience" (1983, 166). While a draft may be revised to develop content or to more effectively accomplish its purpose for its particular audience, and thereby exhibit varying degrees of writer- or reader-based prose, the writer's revising process itself cannot be divided into internal and external revision on the basis of the type of change to the text. Such a dichotomy assumed that internal and external revision required different cognitive skills rather than different foci, and further encouraged a text-based view of revision. And the view that writer-based prose "represents a major functional stage in the composing process" (Flower 1979, 34) was merely another way of expressing a stage model of composing.

In her article on "Revising Writer-Based Prose," however, Flower noted an aspect of revision that further called into question the idea of revision as simply changing a written text: "When it [revision] goes on in our heads before we commit words to paper, we call it thinking and organizing. When we do it slightly later and on paper, we call it revision" (1981, 72). Consequently, revision can operate on mental texts as well as physical texts, a fact which links revision to mental planning and organizing and helps explain why a minimally revised text could receive a high quality rating. Flower and Hayes' (1981) model of the cognitive processes involved in composing (Figure 2) takes into account this possibility of "pre-textual revision" (Witte 1985, 264), and the widespread acceptance of this model radically changed the way theorists and researchers thought about both composing and revision. In Figure 2, the arrows represent information flows between the three main elements influencing composing (task

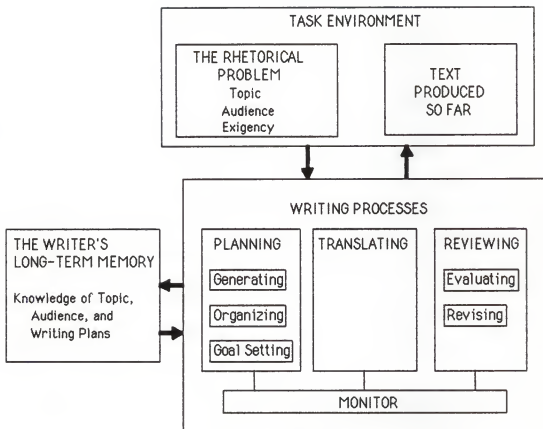


Figure 2. Flower and Hayes' Model of the Cognitive Processes In Composing (1981, 370).

environment, writing processes, and the writer's long-term memory), as well as between the different writing processes (planning, translating, evaluating). Unlike the traditional stage model of composing which reflects the development of the writing product, this model reflects the underlying cognitive processes that influence how this product is produced. Although not accounting for the affective, or emotional, elements of composing (Brand 439), this model is useful because it specifically identifies what Sommers called the "hierarchical set of sub-processes" involved in composing-- cognitive skills that influence writing competency.

While an extensive discussion of this model is outside the bounds of this study, the importance of this model in terms of revision theory and research cannot be underestimated. First, Flower and Hayes' model was one of the first to be based upon empirical evidence, evidence in the form of thinking-aloud protocols of how writers think during composing. Their subjects were given a writing task and asked to verbalize their thoughts throughout the entire writing session. The results of these sessions yielded long transcripts which Flower and Hayes used as their data base to develop their model. While these protocols could only reflect a portion of the writer's actual mental activity, they provided a window through which the researchers could better view the complex processes involved in composing. Secondly, as Stephen Witte has observed, Flower and Hayes recognized the fact that "reviewing and the subprocesses of evaluating or revising can be embedded in planning or in the subprocesses of generating, organizing, or goal setting" (1985, 264). Because it is defined as a cognitive activity rather than something that happens to written texts, revision can occur at any time during composing. And because the object of revision may be the writer's plans in addition to the writer's text, whether mental or physical, the model allows for the fact that "revising a written text is the same process as revising a pre-text" (Witte 1985, 264).

The increased understanding of the recursive nature of composing and its attendant sub-processes led in turn to the development of alternative models of revision which progressively departed from a text-based view of revision. As previously noted, Nancy Sommers viewed revision as a recursive process initiated by a writer's sense of

dissonance or incongruence between the intended and the actual text (1981, 42). A writer would then change the text until it conformed to these intentions. Lillian Bridwell (1980) posited a similar model of revision (Figure 3) initiated by a writer rescanning or rereading the text to discriminate meaning or form (219). If this rereading led to a sense of dissonance, the writer would then decide whether or not to make a change. If the writer decided not to make a change, text production would

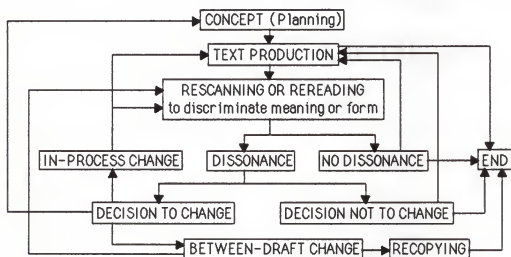


Figure 3. Bridwell's Model of Revision In the Composing Process (1980, 219).

resume or end. If the writer decided to make a change, either text planning, text production, continued rereading, or recopying would follow.

While assuming a text-based definition of revision, Bridwell's model aptly illustrates both the recursive nature of revision and composing and some of the cognitive skills involved in revision. In this model, these skills, which may vary among different writers, include the ability to read and comprehend a written text, the ability to perceive a discrepancy between the actual and intended text, and the ability to make the



necessary changes to the text. In her study, Bridwell noted "substantial variations in the students' perception of the need to revise or willingness to revise" (1980, 207).

Charles Stallard's good writers reviewed more often than average writers, which may be one reason why they made more revisions (1974, 211). Beach's extensive revisers were better able than the nonrevisers to both comprehend their texts in "holistic terms" (1976, 162) and perceive the need to further clarify and reformulate their writing. Sommers' student writers seemed to lack these "strategies for handling the whole essay" (1981, 383).

Bridwell's early model of revision as a process, then, helped identify specific subskills of revision. As several studies have indicated, these skills may be developmental (Calkins 1980, Graves 1979, Pianko 1979). Because cognitive resources are limited, younger or inexperienced writers direct their attention to the most salient demands of composing--generating ideas and producing text. In other words, cognitive resources are allotted according to a hierarchy of concerns. Ellen Nold (1982b) posited a developmental taxonomy of these concerns, ranging from basic skills such as the act of physically producing text and making it conform to standard usage, to more sophisticated skills such as determining purpose and analyzing the audience. She noted that "skilled writers can produce much better writing than unskilled writers not only because they have learned the conventions but because they have strategies for reducing the load on their attention" (17). Marlene Scardamalia and Carl Bereiter, in a study analyzing the subskills of revision in children, attempt to determine if children, given a strategy to reduce the cognitive demands of evaluation and revision, can

successfully revise. They based their work on a dissonance model of revision called the CDO Process (Figure 4), standing for "compare, diagnose, and operate" (1983, 69). This process interrupts other composing processes as the writer stops to compare the written to the intended text, decide whether a problem exists, diagnose the problem, choose a tactic to address the problem, and lastly generate the change. Or, after diagnosis, the writer may choose to alter intentions rather than the text, in which case the process ends.

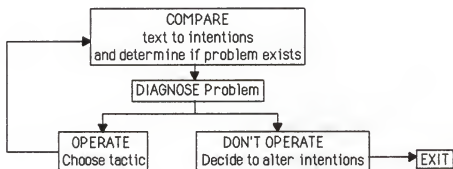


Figure 4. Scardamalia and Bereiter's CDO Process Model of Revision (1983, 69).

This model, which also assumes a text-based definition of revision, is basically a simplified version of Bridwell's dissonance model. However, this simplicity was deliberate because the study attempted to determine where the process breaks down. Scardamalia and Bereiter used a method of "procedural facilitation" (68) that consisted of "designing and teaching a simplified executive routine that requires fewer attentional resources while nevertheless allowing the child's system of production to remain essentially intact" (68-69). During the writing sessions, after each sentence was written, the student writer chose one of eleven possible evaluations and explained the

choice to the researcher. The student then chose one of six tactics to remedy the problem, attempted the revision, and proceeded to the next sentence. Based on the results of their analysis of ninety students in the fourth, sixth, and eighth grades, Scardamalia and Bereiter found that students for the most part made appropriate evaluations; however, only the eighth-grade students, on the average, made appropriate diagnoses, or reasons for choosing the evaluation. Children's ability to choose an effective tactic also increased with age. However, these students' problems with diagnosing and remedying textual problems could have been due to a lack of practice rather than to a lack of ability, for as Scardamalia and Bereiter note, "a person might grow up to be a fluent and prolific writer without ever developing much skill in diagnosing text problems and remedying them" (92).

While these models of revision help illustrate the skills involved in making revisions to written texts, they fail to account for pre-textual revision, which can greatly influence the amount of textual revision. As Stephen Witte notes:

Revising ineffectively or not revising at all something like a pre-text thus becomes a necessary condition for revising or not revising a written text. If the writer fails to resolve dissonance at the level of pre-text, that dissonance is likely to persist following the production of a written text and will likely result in textual revising to eliminate the dissonance, providing that the writer has a strategy for resolving it; if the dissonance is resolved prior to transcription, little or no retranscription may be necessary . . . To limit the study of the causes of revising to perceived dissonance between intentions and transcribed text is

either to deny that composing itself is a hierarchical process or that its subprocesses are integral parts of that hierarchical process. (1985, 266)

Thus, the degree to which a writer develops and revises a pre-text can affect the amount and kind of textual revision that occurs. The nature of this pre-text "is probably a function of the quality, kind, and extent of planning that occurs prior to transcription (Witte 277). Any acceptable model of revision, then, must account for the possibility of pretextual revision.

### **A New Model of Revision**

John Hayes, Linda Flower, Karen Schriver, James Stratman, and Linda Carey recently published a new model of revision based on the results of their studies involving thinking-aloud protocols (1987. See also Flower and Hayes, et al. 1986). They define revision as "the writer's attempt to improve a plan or text" (177), a definition which allows the possibility of pretextual revision. Their model (Figure 5), the most comprehensive to date, illustrates both the processes involved in revision, as well as the writer's knowledge which influences those processes. Additionally, because the model is not based upon the dissonance between an actual and intended text, it allows for the other types of evaluations that writers make, such as comparing the text to general criteria for texts, comparing another's text to the writer's inferred intention (as when evaluating another writer's work), or comparing a writing plan to criteria for plans. This last type of evaluation, according to Hayes and Flower, et al., may be "the most important in producing high-quality revisions" (180).

As evident in Figure 5, this model "divides the revision process into several major

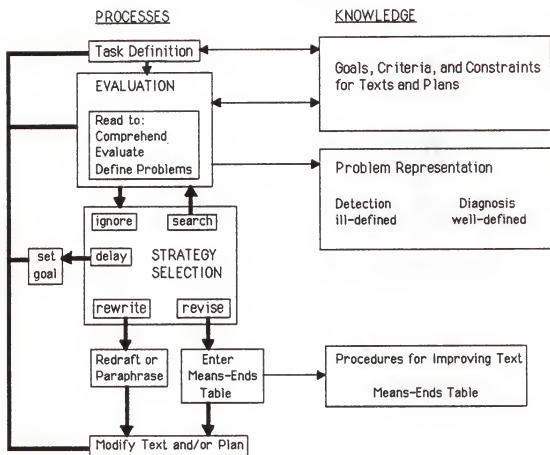


Figure 5. Cognitive Processes In Revision (Hayes, Flower, et al. 1987, 24).

subprocesses" (184) which interact with the writer's knowledge. The task definition is the writer's usually tacit understanding of what revision encompasses; it reflects "writers' conception of relevant revision criteria, revision activities, and ways of managing these activities over time" (190). The writer's task definition determines what sorts of problems the writer will pay attention to and how the writer will address these problems. This task definition is similar to what previous researchers called the writer's conception of revision, a factor which varies considerably among writers, although this conception can be modified. The outputs of the task definition process (on

the right side of the model) are the goals, criteria, and constraints for texts and plans, "regulatory" (191) knowledge that will influence the overall revision process, in particular the subprocess of evaluation.

Evaluation involves the "reading" of a text or plan (pre-text) to comprehend its meaning and to evaluate its mental representation against selected criteria to detect any problems that may be present. As previously noted, a writer may evaluate in different ways depending upon whether a text or plan is being evaluated. A writer may also evaluate for different purposes, such as evaluating to determine overall quality (e.g. grading papers) or evaluating to detect and revise a specific type of problem (204). These different evaluative purposes depend upon whether the writer is revising another's work, revising personal work, or revising plans. During the course of evaluation, the writer develops a mental representation of the text or plan, a process which in itself can be quite complicated. Reading a text for comprehension alone involves the ability to decode words, apply grammatical and semantic knowledge, make inferences, use previously acquired knowledge, apply genre conventions, identify gist, and infer the writer's intentions and point of view (202). As illustrated in Table 1, reading a text to evaluate and define problems (both comprehend and criticize) involves the same skills plus the ability to consider the needs of an audience to infer a reader's response (205). Problem detection can result from any one of these reading skills.

When the writer "reads" the text or plan, constructs a representation of its meaning, compares it to relevant criteria, and detects a problem, the result is a

Table 1. Reading For Evaluation: Skills and Problems Detected.  
 (Adapted from Hayes, Flower, et al., 1987, 205)

<u>Reading Skill</u>	<u>Problem Detected</u>
Decode Words	Spelling Faults
Apply Grammar Knowledge	Grammar Faults
Apply Semantic Knowledge	Ambiguities and Referent Problems
Make Instantiations & Factual Inferences	Faulty Logic and Inconsistencies
Use Schemas and World Knowledge	Errors of Fact and Schema
Apply Genre Conventions	Faulty Text Structure
Infer Gist	Incoherence
Infer Writer's Intentions & Pt. of View	Disorganization
Consider Audience Needs	Appropriate tone or complexity

problem representation, the output of evaluation. A problem may be relatively ill- or well-defined depending upon the extent to which the writer is able to put the problem in "a class or category of . . . problems the reviser already knows" (213). In this model, a problem that is well-defined is said to be diagnosed. Diagnosis, however, is not a prerequisite for attempting to address the problem; a writer may choose to reformulate the text or plan rather than revise it in light of a specific diagnosis. Whether ill- or well-defined, however, the detection and representation of a problem is necessary for the writer to choose a strategy to address it. In the subprocess of strategy selection, the writer decides either to ignore the problem, delay the effort to solve the problem, search for more information to solve the problem, rewrite the text by redrafting or paraphrasing, or revise the text by relying on a problem diagnosis (223). If revision is the choice, the writer draws upon a store of learned procedures for addressing specific problems. Whether the writer chooses to rewrite or revise, the result is a modified text or plan.

This model of the cognitive processes in revision is the only one to date that accounts

for previous research findings in revision. In particular, it helps explain the differences between the way expert and novice writers revise by identifying specific skills that can be a "source of trouble for novices" (184). In regards to task definition, Hayes and Flower, et al., found through their protocol-based research that expert writers, compared to novice writers, "have more knowledge about how to make process plans to guide task performance" (197), have a larger "inventory" of potential problems to address, and take the rhetorical situation and purpose into account when developing goals for revision. Furthermore, expert writers seem better able to allot cognitive resources to specific subtasks in revision. In contrast, novice writers "do not set goals or make plans for approaching the task in a comprehensive way" (199), and their goals for revision are more rule-based than situation-specific. Some subskills related to task definition, therefore, include the ability to "set goals and make plans for revising" (199), prioritize the criteria for revision to effectively utilize cognitive resources, know what information to pay attention to in the text or plan in relation to these criteria, and consider the purpose and constraints of the rhetorical situation in the revision task. One reason for the expert/novice differences in revision, then, may be that writers of differing abilities define and approach revision in altogether different ways, and evaluate their texts or plans with different goals, criteria, and constraints for revision. As Hayes and Flower, et al., put it, "experts see revision as a whole-text task, whereas students see it largely as a sentence-level task" (233).

Writers also differ in their abilities to evaluate a text or plan (Beach 1976, 1979, 1984; Rubin 1984). Novice writers concentrate their evaluations and revisions at the



local level, while expert writers are more able to make global or whole-text evaluations influencing later revisions. This finding may be attributable to either a limited conception, or task definition, of revision, or a lack of ability in the subskills of evaluation leading to higher-level problem detection, in particular reading tasks (Table 1). Novice writers may be more adept at detecting spelling or grammar faults than problems of disorganization or tone if the skills of decoding words and applying grammar knowledge are more automatic than the skills of inferring the writer's intentions and point of view and considering the audience's needs. Stephen Witte found that how "students decide to revise a text is largely dependent on their understanding of the text, an understanding garnered only through reading" (1983, 335). Indeed, Hayes and Flower's, et al., research indicates that "novices are less likely than experts to (1) infer gist, (2) infer the writer's intentions, and (3) consider the reader's needs" (206), a fact which would limit the number of whole-text problems they can detect. And because problem detection must precede revision, problems that remain undetected will remain unrevised. Thus, the fact that "novices simply give themselves far fewer problems to deal with from the start" (217) may be due to an underdeveloped task definition leading to inadequate goals, criteria, and constraints for texts and plans, as well as a lack of ability in the different subskills of evaluation, particularly the ability to read critically (Newkirk 1981).

In the subprocess of strategy selection, writers choose how they will deal with the problems they have represented. This skill is also associated with expert/novice differences. Hayes and Flower, et al., find that expert writers chose revision strategies

in light of "the text's purpose and goals" (223), while novice writers tended to use "a few rule-governed procedures to solve most problems" (222) they detected. They conclude that "expert performance is marked by the ability to make strategic decisions about which path to choose given the rhetorical situation, the quality of the text produced so far, and the pragmatic constraints under which the revision activity takes place" (232). In other words, the strategy selections of expert writers are situation-specific rather than rule-governed. Interestingly, the "ignore" strategy, while sometimes a strategic choice on the part of expert writers, was often a "default strategy in the hands of inexperienced writers" (224). Hayes and Flower, et al., find that expert writers, compared to novices, have a larger store of strategic options upon which to draw when revising a diagnosed problem. This helps explain why even if writers can detect problems, they may not necessarily be able to fix them.

#### **Pedagogical Implications**

The pedagogical implication of the Hayes and Flower, et al., model of revision is that in order to teach students a complex cognitive task such as revision, teachers should focus on improving skill in each of the subtasks influencing effective revision. This reasoning is based on the assumptions that "[1] cognitive resources are limited, [2] this limited capacity can be stretched to do more work, [and 3] each of the subtasks of a complex cognitive task demands a portion of the total resources (attention) available for cognitive processing," depending upon how well the subtask is learned and how much attention the writer decides to give that subtask (Nold 1982a, 14). Teachers can help students manage the cognitive demands of revision by helping to make some of the

subtasks routine and by teaching "strategies that ensure attention to all subtasks over the course of time" (Nold 1982a, 15).

For example, teachers can help students broaden their understanding of the nature of revision and develop more appropriate task definitions. In a discussion of two case studies, Thomas Newkirk noted that students may fail to revise or revise for the worse because of invalid goals or criteria for their texts (1981). One of his subjects left out important detail for fear of boring the audience, while another resisted needed revision out of a positivistic approach to writing that assumed only one way of expressing ideas. However, these inappropriate task definitions can be altered through the teaching environment (task environment in Figure 2). "Whenever a reviser accesses new information from the task environment, the reviser's priorities for executing various subprocesses associated with the task may be altered; thus, the reviser's (current) task definition may change" (Hayes, Flower, et al., 191). Therefore teachers can focus instructional effort on helping students develop adequate goals and criteria for revising their texts and plans.

Helping students develop, evaluate, and revise text plans is one area in particular that may help students improve writing and revision skills. Hayes and Flower, et al., note that "the weight of evidence suggests that the real advantage of experts lies in the greater attention they devote to the evaluation and revision of text plans" (207). Carol Berkenkotter found that Donald Murray, despite his emphasis on textual revision, spent more time planning and editing than revising (160) and that his revising and planning activities were "virtually inseparable" (162). Expert writers perform better than

novices not because they revise more but because they know how to plan their writing with the rhetorical purpose and audience in mind, develop procedures to adapt their writing to these constraints, and write with these constraints in mind. Expert writers "discover" meaning not only through writing, but also through planning, which is essentially setting goals and establishing procedures to achieve those goals (Meyer 37). Activities which help students both understand the goals of their writing task and develop steps to reach those goals may help students write better first drafts and evaluate their drafts in light of the goals they have established.

For example, if students are assigned to write an argumentative paper, instruction should go beyond a discussion of the major issues surrounding the topic and an assignment exhorting students to develop a thesis and use appropriate supports to validate their claims. Rather, after helping students develop their ideas through inventional heuristics, instruction should focus on helping students develop and revise their argumentative strategy, perhaps by having them articulate a response to the following questions: Who is my audience? What are their attitudes toward my subject? If they are opposed to my viewpoint, why? What arguments do I have or can I develop to persuade them to reconsider their stance? If my audience is in favor of my viewpoint, how can I present the argument in a manner to confirm and further validate their belief? In what order should I present my arguments to best persuade my audience? These and similar questions can help students develop plans for writing that are adapted to the constraints of the writing situation, and can give them concrete criteria against which to evaluate their initial drafts.

Another way in which teachers can influence students' task definitions is through teacher response. However, responding to student writing to encourage necessary revision can be either helpful or harmful. In a study of revision-related teacher commentary, Nancy Sommers (1982) noted that many teacher comments were not text-specific, used vague, difficult-to-understand terminology, and focused on both local and global concerns, which made it difficult for students to see what was most important. Sommers suggests that teacher comments should be adapted to the particular draft being read (155) and be focused on the most important problem(s). In her words, "we need to sabotage our students' conviction that the drafts they have written are complete and coherent. Our comments need to offer students revision tasks of a different order of complexity and sophistication from the ones they themselves identify . . ." (154). In a study investigating the effects of focused teacher comment, method of teaching, and degree of revision activity on student writing skills, George Hillocks, Jr., (1982) found that "practice in revising, when focused on particular goals or skills over several pieces of writing, can affect writing skills as displayed in subsequent new pieces of writing, and not simply in subsequent revision" (276). These strong gains in both writing and revision skills were associated with focused teacher comments, which makes implicit sense given the assumption that "writers . . . cannot pay attention to everything successfully at one time" (McDonald 169).

In addition to helping students develop more adequate task definitions, or goals, criteria, and constraints for revision, teachers need to provide specific instruction in evaluation, strategy selection, and actual rewriting or revision. For example,

instruction could include in-class workshops helping students develop their evaluative skills by reading other students' papers and providing feedback in terms of specific, predetermined criteria. Or teachers could illustrate the concrete "how-to's" of revision by helping students develop and revise a hypothetical text plan in response to a given writing situation, or by revising segments of prose on an overhead projector, with class input. Providing "facilitative commentary" (Knoblauch and Brannon, 1981) alone would be like handing a student a flute and telling them to play it without showing them how. Learning to write and revise is an acquired skill just like playing an instrument. Mastery is impossible without specific "how-to" instruction. To play the flute, a beginner needs to learn how to hold the instrument, place the hands and fingers on the proper keys, coordinate hand movements to sound different notes, breathe with the diaphragm for adequate support, and blow over the tone hole at just the right angle with the right amount of air and the correct tongue position. To revise a text or plan, a writer also needs to develop a set of specific skills. Therefore, "to improve students' performance in revision, one may have to improve their ability to perform on a number of discrete subtasks--as well as increase what they know about texts, writing, and revision . . . research suggests that we may have to most impact on the revising process of inexperienced writers if we find ways to give them a bigger repertory of options[--options that will give them flexibility and increase their problem-solving power" (Hayes, Flower, et al., 1985, 233). To so influence students' abilities in revision, teachers first need to understand the nature of revision both academically and experientially. Then they can hand the flute to the student and show how to use it.

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Revision: Research, Theory, and Pedagogy

by

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AN ABSTRACT OF A REPORT

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Revision research has been influenced by the dominance of current-traditional rhetoric, which fosters a view of revision as polishing prose. The stage model of the composing process further encouraged such a view by placing revision as the final stage in the composing process and defining it as changes to a written text. Early revision research consequently focused on describing the revisions of different groups of writers, developing varying taxonomies of revision, and characterizing expert/novice differences. Early studies of writers' textual revisions indicated that expert writers, compared to novice writers, have a more extensive view of what revision can entail, can better evaluate their texts, particularly in terms of the rhetorical situation, and are more successful in the revisions they make. Early studies illustrating the recursive nature of revision reflected a growing dissatisfaction with the stage model of composing as a basis for revision research. The Flower and Hayes model of the cognitive processes in composing illustrated the recursive and hierarchical nature of both composing and revision, and broadened the definition of revision to include revising a mental plan or text. Early models of the revision process attempted to take into account this mental revision but were still text-based in their conception of revision as a process initiated by dissonance between an intended and actual text. The Hayes, Flower, et al., model of revision allows for mental, or pretextual, revision and illustrates the subprocesses and knowledge involved in the process of revision. According to this model, revision is regulated by the writer's task definition, which produces goals, criteria, and constraints influencing how the writer revises. During evaluation, the writer "reads" the text or plan first to comprehend its meaning and second to evaluate and detect problems. The writer's problem representation, whether ill- or well-defined, in turn influences which strategy is selected to address the problem, whether to ignore it, search the text for more information, delay revision, or rewrite or revise. During revision, which results from a specific diagnosis of the problem, the writer draws upon mental procedures for improving the text or plan. The pedagogical implication of this model is that to improve overall revision skill, teachers should focus instruction on the subprocesses within revision. Teachers should not only broaden students' task definitions of revision, but also provide specific "how-to" instruction in methods of evaluation and rewriting or revision.