

Randall G. Nichols

WORD PROCESSING AND BASIC WRITERS

BACKGROUND

When a word processing system became available to me, I began using it in my work, and I noticed that my papers and the ways I went about composing were changing, sometimes with pleasing results and sometimes not. Increased revising probably had made my final products better, but I was bothered that I didn't feel "finished" with many texts—I submitted them with the nagging feeling that more improvements could have been made. At the same time, I was teaching sections of basic writing at The Ohio State University, and some of the faculty were beginning a pilot project in which the writers would use a word processing system. I wondered, then, if the composing processes and products of the basic writers would be affected by use of such a system.

The writers with whom I worked were the least skilled of the students coming in to Ohio State University for their freshman year. They were enrolled in the first of a two-course sequence into which they had been placed on the basis of two screenings. The first screening was their having scored 15 or below on the English section of the ACT. They were then required to write a placement essay which was read by teachers of basic writing. Based on this essay, the writers could have been placed in regular Freshman English or in either of the two "remedial" courses, neither of which counted for credit toward graduation but did count toward a grade point average. The students who placed in the first of the two courses had their writing problems not only in focus, organization, and development, but in surface-level features as well.

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Many anecdotal and glowing reports led me to believe that the very serious composing problems of the writers I was teaching might begin to be corrected if they were to use a word processing system. More rigorous studies, too, have been reported. In *Writing & Computers*, Daiute summarizes research about word processing by reporting that physical and psychological constraints may be eased so that the computer complements writers' capacities, does some of the drudge work, and reminds student of their potential audience (68). She states, "Many writing teachers believe that reducing the burdens of manual cutting, pasting, and recopying will encourage students to act more like experienced writers, who revise extensively" (37).

Several studies have examined some of the effects of word processing and related programs on the composing processes of writers similar to the basic writers with whom I was working. Collier studied the effects of text editing on the revision strategies of students of various skills levels in an introductory, college composition course. Kiefer and Smith examined basic writers using the text analysis programs of *Writer's Workbench*. Bridwell, Johnson, and Brehe studied experienced college writers. Bridwell, Sirc, and Brooke examined writers from upper-level composition courses. Kane reported on eighth graders with a range of composing skills. However, no studies examined only basic writers' use of word processing alone.

RESEARCH QUESTION

Given the absence of research about the use of word processing by basic writers, I posed a broadly stated question. I wanted the first look at these writers using word processing to seek answers wherever they might lie: *What effects does word processing have on the composing process of basic writers?* Though I felt the approach to the study should be broad, I knew that I'd have to look to current research and theory about composing to guide my reporting of any findings that might emerge. One way of studying effects is to examine the composing processes in order to understand, as Hairston (84) explains, both how and why text is produced. The process approach to composing has given rise to interrelated views of the process.

One view of process is that writing is more linear: that view describes *stages*, or steps, in the process. Rohman and Wlecke: Elbow, Legum and Krashen: and Applebee have described the writing process in terms of stages. King summarizes the descriptions of the stages as: pre-writing (all preparatory activities up to text production), articulation (text production), post-writing (all activities in revision). The primary differences in the theories are in "the numbers and labels of their writing process components" (Humes 4). Humes concludes that a shift away from linear theories is occurring because they tend to "describe the growth of the written product" (4). Emerging theories grow out of concerns for the internal, cognitive processes and view composing behaviors as *recursive*, that is, each behavior is called on again and again.

In "A Cognitive Process Theory of Writing," Flower and Hayes have described what they believe are these cognitive processes, and the three major components are: 1. task environment, including the rhetorical problem and text-produced-so-far; 2. long-term memory, including topic, audience, writing plans; 3. writing processes, major aspects of which are planning, translating, and reviewing (7). The theory proposes that writing is a set of orchestrated thinking processes that operate recursively and are *goal-oriented* and proposes that the goals are created by writers during composing.

Perhaps the most important aspect of the theory is the proposal that writing is goal-directed and that writers generate their own goals. Flower and Hayes believe that two categories of goals exist: 1. process goals, the plans writers have for carrying out the act of writing, and 2. content goals, those things a writer wants to say to an audience (16). Some goals are a mix of process and content goals and may change as writing proceeds, depending on various influences of each of the components of the model.

Based upon these theories and Perl's (*Coding*) instrument for coding specific composing behaviors, I was able to specify my research question further with four objectives, to examine the effects of word processing on: specific composing behaviors alone, composing stages, recursiveness of processes, and goals.

METHOD

Given the broad nature of the research question and inherent idiosyncrasies of writers, I chose a naturalistic approach to the study. Multiple case studies constitute such an approach. Further though, I wanted to see, as "cleanly" as possible, the effects of the word processing system alone. So to "control" for any effects on texts which might occur as a result of the writers having conversations with people outside the research situation, they wrote within a self-contained session for both the conventional (pen and paper) and word processing sessions. To control for effects of previous experience with a word processing system, I asked for writers who had not used such a system.

I explained the study to my students on the first day of their freshman term. They were told that any volunteers for the study would not have to complete a short writing assignment that would be given to the rest of the class; would have their composing studied and explained to them in more depth than to other class members; and would likely know how to use the word processing system better and more quickly than the other members. Six writers volunteered. One, James, was used for a pilot test of the procedures, and another could not participate because of equipment and scheduling problems. Consequently, I asked Tess, who had shown interest, to participate. She did so without noticeable hesitation. Five writers, then, participated: Keith, Tess, Diana, Gary, Gina.

For the conventional session, the writers came one at a time to a private room in a library. I explained the verbal protocol method (described below) to them, they practiced it, and then they were interviewed about their writing generally. They then used pen and paper to explain the major reason one of their teachers was effective. The topics used in this study were pretest and posttest topics assigned to all writers in the basic writing program. The topics were chosen because most students were likely to have had experience with the topics and thus would not be penalized for a lack of content for a test. Afterwards, the writers were interviewed about the session. Then they were given four hours, altogether, of formal instruction and practice using the *Bank Street Writer* word processing program and an Apple IIe Microcomputer. Also, they practiced for between four and seven hours of their own time. Finally, from seven to ten days after the conventional session, they used the word processing system to write about the major reason someone was their best friend. Lastly, they were interviewed about the final session and the overall experience. During the study, the writers received no instruction in composition.

In "Protocol Analysis of Writing Processes," Flower and Hayes have argued the merits of both the protocol method and retrospective self-reports which immediately follow composing. The retrospective report is hampered because much memory loss occurs between writing and reporting. While the verbal protocol method requires writers to report aloud about what they are doing and, therefore, suffers less from the problem of memory loss, it may interfere with some processes writers might otherwise employ.

Having tried each procedure with James in the pilot test and finding he was much better able to report what he was doing and why as he composed, I used the verbal protocol method here. Finding the best method for gathering data about composing processes is a research issue which is yet to be resolved (Perl, "Five Writers"; Bridwell, Johnson, Brehe).

As they wrote, the writers spoke about what they were doing and why. Audio and video tapes recorded text production and the writers' verbalizations. I collected all notes and drafts. Later, the tapes were transcribed to a four-column format: 1. text produced, 2. codes for composing behaviors, 3. duration of behaviors, 4. verbal protocol. I added a code for computer interventions to Perl's system of coding behaviors and applied the system (See Table 1, Appendix) to the behaviors of the writers in this study. Results were informally validated by checking them with the writers and with an instructor of basic writing at Ohio State University.

RESULTS

In *Coding the Composing Process: A Guide for Teachers and Researchers*, Perl distinguishes between instances of planning (when writers say what they think they will do) and metacomments (when

writers exit from the writing task to comment knowledgeably about their own writing behaviors). However, in “The Dynamics of Composing: Making Plans and Juggling Constraints,” Flower and Hayes distinguish between writers’ process goals (*how* writers go about writing) and content goals (*what* writers want to say to an audience). Making these distinctions often was very difficult, so for coding purposes I counted as planning (PL) all instances of verbalizations that appeared to be plans, metacomments, or goals.

Also, to make surer comparisons, I counted occurrences of most behaviors within the first 50 words of text produced in each session as well as having counted total occurrences.

In the word processing sessions, only Keith attended to formatting beyond the level of indenting paragraphs. This is curious, but may have been a result of my inadvertently conveying that I was interested mostly in processes that occurred while they entered text. Formatting did not become a major activity for the writers in this study, as it does for many writers.

Table 2 (Appendix) displays counts of coded behaviors for the conventional sessions and for the word processing sessions. Considering outstanding differences in counts of coded behaviors, duration of sessions (Table 3, Appendix), and words produced in sessions (Table 4, Appendix), the following eight trends emerged in the word processing sessions. I considered differences to be outstanding if at least four of five writers exhibited a change in the same direction and if, for the coded behaviors, the differences were of 10% magnitude or more. In the word processing sessions:

1. There was a tendency not to produce second, physical drafts. Tess, Diana, Gary, and Gina did not, and Keith read his second printout but did not make any changes in it.
2. Total writing episodes, “putting pen to paper,” increased, and the lengths of the text strings produced during episodes were shorter.
3. Edits increased.
4. Readings of the topic (from a paper given the writers) increased in the beginnings of the sessions.
5. Verbalized assessments of the texts decreased.
6. Use of the word processing system caused interventions in composing that otherwise would not have appeared.
7. The sessions were of shorter durations.
8. Writers produced more words.

Beyond data counts, one way of portraying differences, or their absence, in sessions is to present final texts from both sessions. I do this for Tess and Gina. However, the texts do not show the processes and, so, do not offer a complete summary of the effects of word processing. Also, the texts presented here have been formatted slightly more neatly than the originals, and the texts from the conventional session are typed, so some of the insight and “feel” for what occurred in production is lost. Finished texts don’t show the struggles the writers went through.

Tess: Conventional Session

The major reason my teacher was effective, was that the style of her teaching was not only understanding, but she had a clear knowledge about what she was teaching. She also helped student tutor on whatever subject they needed help on or just what they didn't understand. Not only did she give new ideas and new prospects toward her style of teaching, she also advised me on how I should go about doing things in a certain way. Not only was she a teacher she was also a activities advisor and helped me get involved in sports and student council. And last but not least she is an all around good sport.

Tess: Word Processing Session

Through my life I have known many people, some have been very nice to me and some have been not so nice, but the major reason I remember my good friends is because they treated me with respect, and as an equal. there are many meanings to the word respect. The one that I think that relates toward me is the one that states the willingness to show consideration or appreciation of a fellow man or person. Thus to be equal to another person is being the same for all members of a group. These are, in my opinion the two major reasons what a friendship should be based upon.

Gina: Conventional Session

Through my 12 years of schooling I have had many teachers. Although, I have had a good number of well trained teachers one stands out above the rest. Mrs. Grimm, my science teacher, name is ironic in that she always had a smile to share instead of a frown. Posters, paintings, and plants filled the room showing her personality. One poster in the front the room was an ape with the caption "I'm thinking." This made a joke of using the brain, however it made the point in her class one either thinks or fails. During her lectures she would use humor by relating the subject to us in a funny but familiar way. For example, when our class studied sol, liquids, and gel, she referred to sol as being grapes in jello. The reason being because the grapes were suspended in the jello. Because of her use of household terms, I never will forget certain ideas or concepts. Even though she in a easy way her word choice always showed her wide vocabulary and intelligents. Often she revealed personal facts about herself. In these times my classmates and I learned that her schooling took place both in the U.S. and in Germany. Traveling as she did her knowlge came from people and books.

Along with her easy way of teaching, her testing was just as fair. Each test had a combination of multiple choice, essay, and True or False questions. This gave the students the chance to answer the questions in different ways. For instance, some pupils have trouble with essays. Therefore, the multiple choice and true and false question gave them the ability to better their grades on the test. While, others like myself didn't do well on the test. However the many homework assignments brought up our grades. Each night a reading assignment was assigned and a quiz the next day. So if one did her homework the quiz the next day would be a easy A. Looking back Mrs. Grimm was my best teacher. Her good training skills showed in all areas of her teaching

Gina: Word Processing Session

To me a friend is someone I can share my ideas and interests with. Fortunately, I have one very special who I have known well for many years. Throughout these years we have went to school, gone on vacations, and grew up together.

Cathy and I lived across the street from each other for two years before we even became friends. The reason for our unneighborly manner was simply that we went to different schools and had different friends. When we started high school we rode the same bus and became friends. During our high school days we went to every football game, basketball game, and dances together. We both enjoyed getting loud and rowdy at the games. During the evenings, we would study together at her house. Because I spent a lot of time at her house, her parents and I also became friends. Her father and I would get into these water fights almost every night. These games turned into a daily war between the two of us. Each day our tricks became worse. For example, he would put mustard in my shoes if I left them lying around or throw water in my face just to see my expression. One night while he was watching TV, I got him back by sewing all of the necks of his tee shirts closed and tied all of his underwear in knots. Of course we did this all in fun. My friendship grew both with Cathy and her family. And we started doing things together. For the past four years we have gone on vacations together. This works out great because neither of us has a sister and need someone to run around with besides our parents.

Religion is another thing we both share. Even though our religions are different, we are still able to share ideas. When her grandfather was ill with cancer she would often ask me to pray for him and when my family went into the hospital I asked her to pray for them without any hesitation. With some friends I am unable to do this with. But with Cathy we do not hold anything back.

To me a friend is someone I can share my ideas with and time with without getting bored or embarrassed. She also one whom my family treats her as a part of the family and her family treats me as a family member. And through the years our friendship will grow, this is how I feel about my friend Cathy.

Beyond data counts and final products, the writers' comments and my observations about and conversations with the writers offer a more holistic understanding of each writer.

Keith tried to "get it right" before and as he wrote/entered text. In his conventional session, he rehearsed considerably before he committed text to paper, so he made very few revisions during his second drafting. His final draft was virtually just a neater version of his first draft. In his word processing session, he rehearsed more just before entering text, edited relatively less, and did not revise. He was even more compelled to "get it right." Further, he did not have to write a second, physical draft, and so he did not. In these ways, word processing was compatible with Keith's most obvious process goals. It seems contradictory that Keith's word processing session was slightly longer than his conventional, but this was caused by his making an effort of several minutes to format his text and by my having to stop the session briefly to leave the room.

In contrast to other writers, Tess' planning may have changed most obviously. She began using the word processing system immediately and did not outline, a behavior which took about half of the conventional session. When asked about this, she said, "I guess it's because of the computer because you don't need to make outlines or drafts or anything...but on paper...." This change also can be explained by her knowing I was interested in how she used the system and by her thinking her writing task should be made easier. She also decided that outlining on the computer would be difficult, so she did not. She tried to adjust to the system.

However, she struggled with composing throughout the word processing session. She paused more often in long silences. She resorted to looking in a dictionary for clarification of her ideas and for content to support her contention about someone being her best friend. The recursiveness of some of her composing processes, especially planning, increased.

These differences appear to have caused no qualitative changes in Tess' laboring to find and settle on stable processes and content. She remained apparently confused about why and how she was composing and what she wanted to say. At one point in her word processing session, she struggled to decide whether to use "equal" and "respect." Then she edited other words for spelling. She fell silent for a long time. She rehearsed explanations of "equal" and "respect." She was silent again. Then she said, "That's pretty funny. You can't—think of why it's important."

Diana's processes during her word processing session were much the same as those in her conventional session. I was most struck by her in-

ability to explain her goals and planning. For example, at one point in her word processing session she paused for 17 seconds and said, "I'm trying to think of some more to write down." I asked, "Why?" She replied, "Well—to me it seems like I should have more to say." She could not say why she attempted to add more. In fact, except for the fact that she had to press keys, she appeared to take no obvious notice of the word processing system. In this way, word processing was compatible with Diana's process goals.

Gary said that he tried to avoid much of the struggle associated with writing—outlining and "stuff like that." In the conventional session, he rehearsed considerably before writing, and he often edited and revised at the end-point of text production. He said that he thought he was able to use the word processing system to avoid work and work more quickly. For instance, he produced no second draft, revised far less (14 to 3 times) and finished more quickly. Those behaviors fit his contention that "using the computer is so much easier." However, his editing increased tremendously, from 18 to 49 instances, so his assessment was not completely accurate. However, he was able to adapt word processing to many of his process goals such as finishing quickly.

Gina, too, adapted the word processing system, but with different results. In her conventional session, she planned often and at various levels. For instance, "just to get started," she alternated between making notes and producing a few sentences, a strategy whereby her content goals changed often. Though the counts for planning and revising do not appear to have changed much (69/64 and 25/31, respectively), I believe both behaviors increased considerably and did so during her silences, which increased from 101 to 234 instances. Also, the videotape failed to record the last quarter of Gina's word processing session, and no counts could be made during that time; otherwise, increases for these behaviors would be more obvious. The word processing system appears to have encouraged her to plan and revise much more often. In this way, the word processing system was compatible with Gina's approach to composing.

However, this "compatibility" increased Gina's frustration. Her editing, revising, and planning increased, and she sensed she was taking longer than she had in the conventional session. At one point she asked, "Am I taking too long?" She did not want the session to be longer, she was not making progress toward a finished paper with which she was satisfied, and so she was frustrated. At the end of the session, she said she would have preferred to "go away from it" (the text) and finish later.

SUMMARY OF RESULTS

1. *Specific Behaviors:* The writers tended toward increased edits at the point where they had just finished writing, production of shorter text strings, and fewer verbalized assessments of their work. Also, these results plus the writers' statements that they could see the words more clearly, suggest that the writers attended more to the point at which text was being produced.

The writers tended to produce more words in the word processing sessions. Keith changed from a more expository mode in his first paper to a narrative mode in his word processing session, which might account for the increase, and increases for Tess and Diana appear minimal at first glance. However, when the fact that the word processing sessions were shorter is considered, the increases are pronounced; the writers produced more words in less total time.

2. *Stages*: Unlike in the conventional session, the writers tended not to produce second, physical drafts in the word processing session. Only Keith produced a printed copy, read it, and printed again; he made mostly format changes after reading the first printout. All the others printed only one final copy to give to me; they reviewed text on the screen. When processes are seen as more or less distinct “stages” that follow in order from prewriting to composing, to editing, the stages became obscured or even disappeared in the word processing sessions. The writers in this study showed a tendency to start at the beginning of their texts and plan, revise, and edit almost simultaneously until they reached the end of composing. At least under the circumstances of this study, the notion of recursiveness captures the ways basic writers work.
3. *Recursiveness*: When processes are conceived as distinct behaviors housed under the rubric of recursiveness, differences in sessions were more obvious. Use of the word processing system caused interventions in composing that would not have appeared otherwise. For instance, just after having “booted” the system, the writers reread the topic to get their bearings again. Also, typographical errors increased editing and caused production of shorter text strings, so that after the editing, the writers reread at least the last word or two produced, to think about where they were “headed” before the intervention. Recursiveness, then, was increased by use of the word processing system.
4. *Goals and Plans*: Four of the writers adapted the word processing system to their typical goals and plans. Those writers—Keith and Gary, especially—who expressed an aversion to spending time writing and revising used the system to do less of each. Diana’s plans appeared to be the same. Gina revised and planned often in her conventional session, and these behaviors increased in her word processing session. The writers used the system mostly to do “more of the same.”

DISCUSSION

The results of the study are telling as much for what they show about changes that *did not* occur as for what they show about changes that did.

In “The Computer as Stylus and Audience,” Daiute has proposed, first, that word processing is likely to encourage some writers to experiment and revise because physical constraints are eased; and, second, that such a system stimulates writers to take a reader’s point of view and encourages control of cognitive processes because it makes writers more conscious of them. Evidence from this study indicates that many basic writers, upon initial exposure to word processing, do not respond noticeably in these ways.

Both the quantity and quality of revising are not likely to increase dramatically. Even knowledge of the text-block-moving capability may not generally encourage revision. After several hours and days of word processing, only one writer, Gina, ever used that capability. This finding is similar to that of Bridwell, Sirc, and Brooke, who report that writers used the computer to extend revising strategies used in conventional composing, and similar to Collier’s, who found that, “A text editor has little or no advantage over the traditional mode of revising for most of the domains of text” (22).

Of course, revising is a function of goals and plans writers make. Upon initial exposure to word processing, basic writers are not likely to show obvious differences in the kinds of goals and planning they display—except that they may adapt the system to some global composing patterns—because they have no greater awareness of audience or of their own cognitive processes. When I asked the writers in this study why some behavior was occurring, I often heard a hesitant, “—because—” or “—I don’t know,” from all the writers. The blinking cursor may act as an audience (as Daiute suggests), but this means little to writers who have limited skills for composing for an audience.

Further, evidence suggests that word processing initially causes many interventions in composing. Writers who are not sure of system commands and who are not excellent typers will find editing and revising more complex, even difficult. Add to this situation basic writers who are unsure of their skills and of rules for composing, and they may become even more “dogged” in focusing on the hunt for errors and on just-written text, hoping that text will lead to what to write next. Collier’s subjects showed similar increased facilitation with the manipulation of words and phrases/clauses *and* their surface structure errors increased (22). For basic writers, increases such as these probably are detrimental in that they interrupt the writers’ attention to overall plans and goals about their audiences and further complicate an already complex task. Yes, the interventions are interruptions. They certainly cause interruptions in short-term and long-term memory and, in turn, some basic writers may become frustrated.

In many ways, Gina was the most interesting of the writers to observe. She exhibited a characteristic of experienced writers in that she worked at more global levels of her text, often reformulating her content goals according to what she discovered as she wrote, and revising the whole of her text as a consequence. Word processing encouraged her revising. Later, Gina tested out of the next basic writing course in the sequence and went on to regular Freshman English, where she received a *B +*. She used a word processing system throughout her first year of school, whereas the other writers reported that they did not use a system often or at all after the study, partly because they did not have easy access to a system, but partly because they did not “see” much advantage to it.

Gina’s example suggests that “better” writers are more likely than basic writers to learn, adapt, and continue using a word processing system in advantageous ways. This often may be the case. Collier, for instance, reported that, “Using a text editor is clearly an advantage for the superior student and is of some advantage for the average student” (22). However, Gina’s word processing session was not without problems. Her paper from the word processing session is poorer mechanically than her earlier paper. Her revising increased so much and became so complex—and she was so busy with system commands—that she became frustrated and consciously decided not to correct spelling and formatting when she finished the session. And we have evidence that not even more experienced writers will benefit in every instance. Gould found that writers experienced in both composing and word processing adopted “poor composing strategies” when writing letters and that the writers were led to “thinking less and typing more” (605). If experienced writers sometimes use word processing in less than useful ways, many basic writers are certain not to show any advantage, at least initially.

IMPLICATIONS

This study should be replicated, with particular emphasis in two areas. First, the degree to which the writers in this study attended more to meaning or to surface features caused by mistyping or by misuse of the system is unclear. The writers said they could see the words “clearer,” which may imply attention to meaning, but they also expressed concern about having mis-hit keys. Given observations about the writers’ goals and increased edits, I suspect that the writers increased their attention mostly to surface features.

Second, we need to examine basic writers’ use of word processing under various circumstances, not just in one writing session or within an initial introduction to word processing. If, in other circumstances, increased word production occurs—as Collier (22) found with his student writers—and is accompanied by increased sentence-embedding transformations, use of word processing could mean positive changes in syntactic fluency and text effectiveness. Revision, too, should be examined under various circumstances. Revising within a writing session may not change dramatically, but in contexts outside the kind presented by this

study, the number of sessions and the number of text-enhancing revisions, therefore, may increase.

Interruptions in composing caused by word processing systems are likely to decrease when systems include routines that help with editing functions such as spelling—if writers learn to edit at a time when they are not constructing meaning. As a corollary, students should be given easy, constant access to word processing systems so they have more optimum conditions under which to practice using systems.

Improved systems and increased experience with a system may alleviate some of the difficulties basic writers are likely to encounter, but still, learning and using system commands are tasks required beyond what is needed to write with pen and paper. They will cause interruptions in composing, and the time needed for learning word processing systems probably is greater than we might guess. One of the requirements for volunteering for this study was the writers' judgment that they typed fairly well. These writers and some of their classmates, in 10 weeks of using the system, did not become comfortable with some of its procedures, block-moves of text, for instance. Some students even changed class sections to avoid using word processing.

Daiute, in *Writing and Computers*, suggests that, in order to decrease the interference caused by inexperience with word processing, some writers "...should compose familiar material on the computer until they no longer have to think about the commands" (67). This approach is useful for many writers, but the problem for most basic writers is more difficult; they struggle to compose even with familiar material. It makes more sense for teachers to separate initial learning of a word processing system as much as possible from the composing task. This need not be the case for every writer, and the time needed to attain proficiency with a system will not be the same in every instance, but we need not confound many basic writers' composing tasks with learning word processing.

Finally, I think teachers of basic writers should be prepared for a variety of student reactions to word processing. Certainly many writers will be enthusiastic about its use. Not having to recopy an entire text, for instance, seems a blessing to most of us. But some basic writers won't express attitudes about, or even be aware of, the effects of word processing; some will become frustrated by its adding to an already difficult task; and some will simply avoid word processing out-of-hand. Under these circumstances, I think the best we can do for basic writers is to offer advice, instruction, and opportunities for word processing, without requiring its use. Our primary responsibility is to help writers gain experience in communicating with words, not in word processing. Composing is more than word processing.

Appendix

Table 1

Explanation of Codes (items 1-12 per Perl)

1. **Planning (PL)**—instances when writers say what they think they will do. Includes strategies and intentions for global and local structures of the writing.
2. **Metacommenting (MC)**—instances in which writers exit from the writing task to comment knowledgeably on their writing behaviors.
3. **Rehearsing (Rh)**—voicing words which lead to text production.
4. **Writing (W)**—text production, including those times when text is spoken as it is written.
5. **Reviewing (Rt, Ra, Ra-b)**—instances when writers read the topic, last few words of text produced, or several sentences of produced text.
6. **Assessing (A)**—instances in which writers make judgments about what they have written.
7. **Commenting (C)**—statements writers make about the room they are in, how they feel, researcher presence, for instance. Comments about anything but their composing or the computer-assisted system.
8. **Questioning (Q)**—instances when writers ask about anything but the computer system.
9. **Revising (RV)**—changes in already-produced text, including additions and deletions. Does not include changes in spelling, punctuation, and grammar.
10. **Editing (E)**—changes in already-produced spelling, punctuation, grammar. Includes additions and deletions to text.
11. **Silence (S)**—instances in which no overt behavior occurs, including both writing and talking.
12. **Researcher Intervention (RI)**—instances in which the researcher asks a question, makes a comment, or otherwise interrupts the writer.
13. **Computer Intervention (CI)**—instances in which the computer or program intervenes (e.g., to scroll text) or the writer stops composing to comment about or use the computer-assisted system.

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Table 2
(For Explanation of Codes, See Table 1)

Counts of Specific Behaviors^a

	KEITH		TESS		DIANA		GARY		GINA ^c	
	TOTAL	W/50 ^b WORDS	TOTAL	W/50 WORDS	TOTAL	W/50 WORDS	TOTAL	W/50 WORDS	TOTAL	W/50 WORDS
PL:	34/31	12/7	14/55	5/15	24/32	3/17	18/31	4/14	69/64	25/22
Rh:	49/50	16/11	10/36	7/14	13/4	11/3	51/24	16/12	3/0	1/0
W:	112/124	19/20	64/90	18/22	25/34	13/21	118/111	16/28	157/233	10/16
RT	2/4	2/4	5/5	0/5	8/4	7/4	1/4	1/4	4/6	3/6
R:Ra		9/3		5/8		2/10		5/15		2/0
Ra-b		3/2		9/11		1/1		0/0		1/0
A:	16/4	5/1	9/7	1/3	0/0	0/0	15/8	0/3	5/0	1/0
C:	9/15	4/3	17/25	0/3	15/12	4/2	8/11	0/1	28/22	4/6
Q:	0/0	0/0	5/3	0/0	1/1	0/0	0/0	0/1	2/3	1/1
RV:	1/0	0/0	5/5	2/1	0/0	0/0	14/3	1/1	25/31	1/2
E:	26/35	5/2	35/34	7/5	3/10	1/2	18/49	3/6	59/98	3/6
S:	42/53	14/13	41/118	12/30	51/48	31/31	87/54	17/18	101/234	14/28
RI:	29/37		12/46		27/33		21/21		58/88	
CI:	20		11		5		20		21	

^aConventional session/word processing session

^bWithin first 50 words produced

^cOnly first three-fourths of Gina's word processing session recorded on videotape, so some counts reflect this.

Table 3

Session Lengths—in minutes (Conventional/Word Processing)

KEITH	TESS	DIANA	GARY	GINA
60/65 minutes	72/67	25/19	55/39	85/132

Table 4

Words Produced (Conventional/Word Processing)

KEITH	TESS	DIANA	GARY	GINA
180/397 minutes	109/113	79/85	139/178	350/420

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