

RESEARCH IN WORD PROCESSING NEWSLETTER

Dr. Bradford A. Morgan and Dr. James M. Schwartz, Editors
South Dakota School of Mines and Technology Rapid City, SD 57701 Phone: (605) 394-2481

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THE EFFECTS OF WORD PROCESSING ON THE CORRECTNESS OF STUDENT WRITING

Christine Hult

When the computer-age Eves of technology first tempted innocent residents of the Garden of English with shiny new Apples, many eagerly assumed that computers would lead to the "tree of knowledge." I overheard a colleague in the hall one day exclaiming that if we would only "computerize" freshman English, all our hours of laborious paper-grading would end. This optimism is rampant in the discipline today. However, the assumption that computers in general, and word processing in particular, will relieve teachers of the onerous task of paper-grading is simply that, an unwarranted assumption. Claims have been made for the benefits of computers in composition, but no comprehensive study has yet shown that computers in composition instruction improve writing quality. It is crucial that we understand just how computers can, and can't, help student writers before we partake of the computer fruit.

Of special interest to teachers of writing are word processing programs. Recently, writing teachers and researchers have begun to speculate on how word processing can benefit student writers. Yet, our knowledge of how word processing programs modify the way students write is slim at best. Existing studies, limited in scope, suggest that word processing may improve the writing of inexperienced writers. For example, a recent study using only four students, concluded that "the computer can be a substantial benefit for beginning writers."¹ A similar study, better designed but again using only four students, posited that "the use of the computer-based text editors would significantly expand the number and the complexity of the operations used by inexperienced writers when revising."² However, a review of the recent literature suggests that little research has been done to substantiate such claims. Currently, there are a few more extensive studies in progress, such as the tests of Bell Laboratories' software at Colorado State University and the research on computers and writing at the University of Minnesota.³ But these studies, broad in definition and scope, do not provide any evidence for the assumption that using word processing in composition instruction will necessarily improve the quality of student writing.

When my colleague referred to "computerizing composition," I'm quite sure he was reacting to the tedium of "correcting" endless grammatical and usage problems he saw in student writing. He hoped that the computer would "correct" the papers before they ever crossed his desk. Necessarily, a part of our judgement of quality in student writing is influenced by the student's adherence to correct standards of grammar and usage. Much as we would like to think we are reading for the student's meaning in his or her writing, we are also reading for the student's adherence to standard written English. My colleague seemed to think that computers would in and of themselves make student writing more correct. In order to test this hypothesis, I designed a study to determine the effects of word processing on the correctness of student writing.

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What the Researchers Say

To begin, I reviewed the recent literature on computers and composition instruction and discovered only two articles which addressed directly the issue of correctness in student writing: William Oates' article "An Evaluation of Computer-Assisted Instruction for English Grammar Review," and Kathleen Kiefer and Charles Smith's article alluded to earlier, "Textual Analysis with Computers: Tests of Bell Laboratories' Computer Software."⁴ Oates' study involved a pre-test and post-test of students using computer assisted instruction (CAI) for grammar review, but students in his study did not use word processing. Oates found that the CAI section showed more gains on a grammar test given at the beginning and the end of the semester than the non-CAI section. As he states in his conclusion, "the CAI section had more attention to grammar and learned more grammar."⁵

Oates makes no attempt to correlate the gains on the grammar test with improved quality in student writing. I think it hardly surprising that if you teach students more grammar, they learn more grammar. Though I have no quarrel with Oates' conclusion that "there is little doubt that CAI is an effective way of providing basic grammar review to beginning writing students," I do disagree with his fundamental assumption that such a review is important, or even connected, to the grammatical correctness of the students' writing. Many composition studies over the last twenty years show such an assumption to be tenuous.

Kiefer and Smith's study of Bell Laboratories' software (computer programs designed to help students edit their work) was more ambitious than Oates' study. The students in the study typed last drafts of their writing assignments into a computer. Using the text editing programs in the Writer's Workbench series, students in the experimental sections ran a spelling program and other text analysis programs, including Diction, Suggest, and Style. Like Oates, Kiefer and Smith used a pre-test/post-test research design. Students took an editing quiz in which they were to identify errors in grammar, mechanics, and punctuation. Students in both their experimental and control groups improved on the editing quiz, with the experimental group identifying "significantly more errors" on the grammar quiz than the control group.⁶ Again, I hardly think this is surprising. The experimental group spent a great deal more time with editing than the control group, by virtue of the editing programs used on the computer. However, a holistic scoring of the actual writing of these two groups failed to distinguish one group's essays as better in "quality" than the other group's essays. The researchers were looking specifically for writing "fluency," but stated that "we can conclude nothing about the effect of DICTION, SUGGEST, and STYLE on overall fluency."⁷

The Texas Tech Experience

The two studies described above do not tell us much about actual student work produced with the aid of word processing. For my study, rather than using an editing test as a measure of student editing skill, I analyzed the correctness of written papers produced by students using word processing as compared to those produced without word processing. In this way, I could determine whether or not the correctness of the student writing improved through the use of word processing. Subjects in the study were randomly placed through computerized registration into sections of freshman English at Texas Tech University. An experimental (computer-assisted) and a control section of freshman English, both taught by an experienced teaching assistant, were designated to participate in the study.⁸ Students in the experimental section were given the option of transferring to another section, though none chose that option. The experimental and control sections were matched for SAT verbal scores with the average SAT verbal for the experimental group being 366 and the average SAT verbal score for the control group being 370 (based on all available scores).

Students in the experimental sections used Texas Tech's Microlab for computer assistance with their papers. The Microlab is available to any student enrolled in an English class and contains seven DEC Rainbow 100 microcomputers plus relevant software. Students were taught word processing through the lab user's guide, but were not given explicit instruction in word processing in class. Also available to students using the Microlab are a proof-reading program (including a spelling checker), a stylistic analysis program that analyzes features such as

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vagueness and excessive use of prepositions, and a comment program which interprets the statistical data from the analysis program for the student. The teacher attempted to keep the teaching method and curriculum in both experimental and control sections as nearly the same as possible, with the exception that students in the experimental class used word processing in the production of their writing assignments and used proofreading and stylistic analysis programs at their own discretion.

A Final Analysis

At the end of the semester, I analyzed the last papers produced by both the experimental and control groups, their sixth writing assignment. These thirty papers were analyzed for thirteen features of correctness: 1. Sentence Fragment, 2. Run-on Sentence/Comma splice, 3. Faulty Verb Tense, 4. Faulty Subject-Verb Agreement, 5. Faulty Modification, 6. Faulty Use of Pronoun, 7. Faulty Use of Possessive, 8. Faulty Use of Comparative and Superlative, 9. Faulty Use of Parallelism, 10. Spelling Errors, 11. Capitalization Errors, 12. Punctuation Errors (other than 1 and 2 above), and 13. Wrong Words.⁹ Four of the thirteen features occurred too infrequently in the sample to warrant inclusion in the study: faulty verb tense, faulty use of pronoun, faulty use of comparative and superlative, and capitalization errors. To facilitate comparisons between the two groups, the sample itself was narrowed to the ten essays from the experimental group and the ten essays from the control group that were most nearly the same length: the twenty papers analyzed averaged 629 words or 31 sentences in length.

**TABLE 1:
OCCURRENCE OF EDITING ERRORS
IN STUDENT ESSAYS**

Type of Error	Total # of Occurrences In Sample		Average # of Occurrences Per Paper		Average # of Occurrences Per Sentence	
	Control (t = 10)	Exper (t = 10)	Control (t = 10)	Exper (t = 10)	Control (t = 31)	Exper (t = 31)
Sentence Fragment	6	4	.6	.4	.19	.13
Run-on/Comma Splice	6	5	.6	.5	.19	.16
S/V Agreement	12	10	1.2	1.0	.39	.32
Modification	8	5	.8	.5	.26	.16
Possession	6	5	.6	.5	.19	.16
Parallel Structure	5	1	.5	.1	.16	.03
Spelling	42	7	4.2	.7	1.40	.22
Punctuation	18	20	1.8	2.0	.58	.64
Wrong Word	26	33	2.6	3.3	.84	1.06
TOTAL	129	90	12.9	9.0	4.16	2.90
TOTAL without Spelling	87	83	8.7	8.3	2.80	2.67

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As can be seen on Table 1, the experimental and control groups were very nearly alike in all of the correctness features analyzed except spelling: 42 spelling errors in the control group compared to 7 errors in the experimental group. This difference is to be expected since the experimental group had access to a spelling checker. The experimental group had fewer editing errors for each feature except punctuation and wrong word use. However, these differences could be accounted for by the ease of proofreading that results from a printed copy as compared to a hand-written copy. Furthermore, when comparing the total occurrence of editing errors other than spelling, the two groups were very similar: 87 errors for the control group, 83 errors for the experimental group (2.8 and 2.7 errors/sentence respectively). Though I have not conducted a statistical analysis of the data, it seems from the results of my preliminary descriptive study that the use of word processing in and of itself does not produce writing which is more correct.

Some students using computers for word processing find the computers fun and different. A positive attitude toward computers by many, but by no means all, students has been noted by several researchers. For students who like to work with computers, who are notoriously poor spellers, or who wish to reduce the rote copying work necessitated by hand-writing papers, computers are fine. In my own work, I find that the retyping time saved by using a computer is invaluable, and I like to provide all my students with the option of using our Microlab should they so desire. But, we should be careful not to be seduced by a bite of the Apple. It is not fair to assume that student writers will necessarily improve their writing simply by using computers for word processing. My study suggests that the grammatical and usage errors made by students do not magically disappear when they use computers. Rather, it seems that, with the exception of spelling, the errors students make in hand-written papers are the same errors they make in computer-produced papers. As computer programs are written that provide good, interactive, writing instruction, maybe we will see the positive effects of such instruction on our students' writing. For now, let's not computerize freshman English.

NOTES

¹ John C. Bean, "Computerized Word-Processing as an Aid to Revision," *College Composition and Communication*, 34, No. 2 (May 1983), 147.

² Richard M. Collier, "The Word Processor and Revision Strategies," *College Composition and Communication*, 34, No. 2 (May 1983), 150.

³ Lillian S. Bridwell, Paula Reed Nancarrow, and Donald Ross, "The Writing Process and the Writing Machine: Current Research on Word Processors Relevant to the Teaching of Composition," in *New Directions in Composition Research*, ed. Richard Beach and Lillian Bridwell (New York: The Guilford Press, 1984), 381-398; Kathleen E. Kiefer and Charles R. Smith, "Textual Analysis with Computers: Tests of Bell Laboratories' Computer Software," *Research in the Teaching of English*, 17, No. 3 (October 1983), 201-214.

⁴ William Oates, "An Evaluation of Computer-Assisted Instruction for English Grammar Review," *Studies in Language Learning*, 3 (1981), 193-200; Kiefer and Smith (see note 3).

⁵ Oates, p. 195.

⁶ Kiefer and Smith, p. 206.

⁷ Kiefer and Smith, p. 208.

⁸ I am grateful to William Welter, graduate teaching assistant at Texas Tech University, who taught the courses used in this study and who helped in the data analysis.

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⁹ For my data analysis, I used the taxonomy of common errors described by Jo-Ann M. Sipple in her book *Teaching Writing: Making Theory Practice Connections* (Columbus, Oh.: Charles E. Merrill, Co., 1984), Appendix A.

Dr. Christine Hult is Director of Composition and Rhetoric in the Department of English at Utah State University in Logan, Utah 84322. She can be reached at (801) 750-3547.

Position in Applied Linguistics

Teachers College, Columbia University, has a tenure-track opening for an applied linguist at the level of Assistant/Associate Professor. The major responsibilities of this position will be

- to teach basic courses that service a range of graduate programs such as Applied Linguistics, TESOL, and English Education.
- to direct dissertation research in the program in Applied Linguistics.
- to train language teachers in the use of computers in the classroom.

Candidates for this position should have an optimal combination of the following:

- a doctorate with a specialty in applied linguistics
- published research in applied linguistics
- language-teaching experience
- teacher-training experience
- experience in administering academic programs
- experience in obtaining funding for and administering research projects
- experience with computers as they are used to facilitate research in applied linguistics and strengthen language teaching in the classroom.

Please send a letter and vita by December 1, 1985, to Professor Clifford Hill, Program in Applied Linguistics, Box, 665C, Teachers College, Columbia University New York, New York 10027

Writing Workshops to Include Word Processing

A Winter Workshop on Teaching Composition to Undergraduates will be held in Clearwater Beach, Florida, on January 5-7, 1986. Sponsored by the Conference on College Composition and Communication and the National Council of Teachers of English, part of the workshop will focus on developing alternative computer applications in writing programs. Bruce C. Appleby and Stephen Bernhardt, both of Southern Illinois University at Carbondale, will lead this segment, along with Stanford University's Ellen Mold. Registration has been set at \$210.00. Contact the 1986 CCC Winter Workshop, 1111 Kenyon Road, Urbana, IL 61801.

Questionnaire Results: Computers in Composition Instruction

Linda J. Stine of Lincoln University has finished summarizing the results of questionnaire which she distributed earlier this year. At least 109 questionnaires were returned (a 49% return rate) though only 91 were complete enough to be useable. Results indicate that there has been little conformity in choosing either hardware or software. Most respondents agreed, however, that more hardware was needed, including more user-friendly software. In addition, most faculty believed that writing assignments in word-processing-oriented courses should be better planned and sequenced.

One question in the survey, for example, asked "What is the one most needed piece of software which you would like to see developed in your classes?" Those responding indicate that a major software market will eventually emerge: "For those of you planning to write software, the market is wide open! Answers to this question included requests for software for the entire writing process from prewriting and idea generation through grammar,

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organization, proofreading/editing. Teachers also want better word processors and tools for commenting and grading. Overall theme seemed to be 'We could use anything that really works.' "

Questionnaire results are available by writing to Linda J. Stine, Master of Human Services Program, Lincoln University, Lincoln University, PA 19632. She will present a more extensive analysis of the data at the NCTE Conference in Philadelphia.

NCTE Annual Convention in Philadelphia

The connection between computers and writing will be explored in several sessions and one-day workshops at the 75th Annual Convention of the National Council of Teachers of English meeting in Philadelphia on November 22-27, 1985, including

Sessions on Saturday, November 23: ■ Where Computers Are Taking the Language Arts ■ Research in Writing on and with Computers ■ Establishing and Using the Microcomputer Writing Center ■ Becoming Creative with the Computer: Teaching Creative Writing on the Word Processor ■ The Computer and Student Writing ■ Meeting of the Assembly on Computers in English

Sessions on Sunday, November 24: ■ Computers in the Classroom: An Update ■ Computers and Composition

Workshops on Monday, November 25: ■ Wordprocessing, the Student's Helper, the Teacher's Friend: The Use of the Macintosh in an Education Setting (Geraldine Abrahms and Beverly K. Hollis)

■ Establishing Guidelines and Procedures for Evaluating Microcomputer Software for Reading and English Classes (Judith Martin-Wambu and Eleanor Armour-Thomas)

Workshops on Tuesday, November 26: ■ Computer Activities You Can Use Monday Morning (William Wresch, Joan Dunfey, and Aaron Stander)

■ From Concept to Computer: Developing Computer-Assisted Writing Programs for Average and Above-Average Students (Diane Hammar, John Donovan, David Alexander, and Marie A. DeRosa)

Workshops on Wednesday, November 27: ■ Designing Courseware for English (Linda Hanson Meeker, Forrest Houlette, and Herbert F. W. Stahlke)

Contact the NCTE, 1111 Kenyon Road, Urbana, IL 61801.

Newsletter for *Writer's Workbench* Users

A new newsletter for those working with AT&T's *Writer's Workbench* is being published two times a year by Charles Smith and Blake Stewart at Colorado State University. Developed by Bell Laboratories, the *Writer's Workbench* is a text-analysis program which runs on the UNIX operating system. A series of programs within *Writer's Workbench* allows prose samples to be quantitatively checked for diction, spelling, punctuation, tone, style, and other aspects of writing.

Published during the summer and winter of each year, the *WUG Newsletter* provides reports from users at various colleges, a bibliography of relevant articles, and other information helpful to those applying *Writer's Workbench* in academic writing programs. Subscriptions are \$5.00 a year. Contact Charles Smith and Blake Stewart, Editors, *WUG Newsletter*, Department of English, Colorado State University, Fort Collins, CO 80523.

A Review of Quintilian

Paula R. Feldman

The *Quintilian Analysis*, which claims to analyze writing style in essays of up to 10,000 words using an IBM-PC or TRS-80, costs \$995 for a site license. It epitomizes the sort of educational software to avoid. The documentation is not only poorly written (undermining one's faith that the designers know anything about writing style) but is also factually inaccurate. If you follow the instructions, you will never get the program to boot. However, hours later, you may figure out for yourself how the instructions *should* read, and successfully boot the program, substituting at a crucial point the DOS "copy" command for the "diskcopy" command called for in the operating instructions.

Even so, what you discover is that *Quintilian* is inappropriate for the freshman writing students its developers say it will help. To use it, students have to retype their essays into the program. (*Quintilian* will not access files already on disk and does not have a word processor suitable for composing purposes.) In keeping with the user-hostile and generally unsophisticated nature of this software, even typing is more difficult and time consuming than usual. You must enter special characters to indicate the end of a paragraph and the end of a text. You cannot use single quotation marks or most abbreviations. Because there is no word wrap in the text editor, essays must be entered line by line. Users who are touch typists and do not watch the monitor screen while entering text are in trouble. For if you type more than the number of characters permitted per line, you overkey the bounds of the program and find yourself with text you cannot access or delete. Since there is no correcting this sort of mistake, the user's only recourse is to start all over again from the beginning.

But let us suppose that a user successfully enters an essay with only a few minor typos. To correct the typos, the student must run yet another program called *CORRECTX*. That done, to run all of *Quintilian*, the user must then go through the composition once again and "code" it—tediously identifying the part of speech of each word in the essay. If ever a torture was devised to make students despise writing, it could not have been better than this one.

But let us suppose that a student completes all of these steps and runs the *Quintilian Analysis* (which, incidentally, is remarkably slow). Much of the feedback the student receives has its basis in various word counting processes. For example, a typical comment sheet begins with a count of the total number of words in the essay and concludes with the following:

SOME DATA ABOUT THIS COMPOSITION

1. Number of sentences— 26
2. Average sentence length— 15.73 words
3. Number of paragraphs— 5
4. Average paragraph length in words— 81.80 words
5. MOST ACTIVE WORDS—

22 - i	16 - the
18 - to	15 - and

How valuable such information is to a freshman is, in my opinion, extremely questionable. *Quintilian's* makers have attempted to take numerical results and translate them into interpretive feedback in prose. However, these comments prove less than satisfactory. Here is an example of the first part of a typical comment sheet (furnished by the publishers for illustration):

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You are writing with above-average word repetition. This suggests, in the essay, a primer-like effect or sometimes even an incantatory effect, depending upon the particular vocabulary involved. In information-oriented texts, e.g. academic or technical, such 'redundancy' may create a strongly emphatic or 'insistent' tone.

You would seem to be writing in a fairly strong monosyllabic style. Are you deliberately striving for simplicity, for the colloquial?

Your vocabulary has a certain simple, common, even elementary aspect to it. Are you trying to be very simple? Are you writing for children? For an audience with limited vocabulary. Indeed, given your high monosyllabic count, you seem to be aiming for an extremely plain, simplistic style....

Your sentences run to the short side, typical of popular journalism or writing for audiences unwilling to cope with longer sentence constructions. Are you using such short sentences for some particular effect? Are you trying to outdo Hemingway? Of course, sometimes 'poetic' styles also have this characteristic.....

Despite the designers' intention to make the prose commentary nonjudgmental, or, in their words, "obviously, quite objective," it does not have that effect. While it is true, as *Quintilian's* documentation asserts, that "the program has never 'met' either the teacher or the student, can't tell men from women, etc.," it does express biases. Consider what a student would sense reading "Your vocabulary has a certain simple, common, even elementary aspect to it. Are you trying to be very simple? Are you writing for children? For an audience with limited vocabulary. Indeed, given your high monosyllabic count, you seem to be aiming for an extremely plain, simplistic style...." A freshman would translate this paragraph on vocabulary to mean: "pretty simple-minded. Don't you know any big words?" A crack like "Are you trying to outdo Hemingway?" is far from "obviously, quite objective" in tone.

The student will not take long to notice that almost all paragraphs in *Quintilian* commentary sheets begin with the words "You" or "Your," making not only for an unusually redundant effect but an extremely poor example of style. The student would be justified in responding "How does this self-righteous computer program get off telling me I'm being repetitious?"

But the biggest objection to *Quintilian* is not that its writing is unexemplary, that the documentation is faulty and incomplete (including more sales pitch than clear instructions), that the software itself is primitive, with bugs that throw you out of the program, that it is slow and clumsy and difficult to use, that an instructor does not need a computer to notice when a student's sentences are too short or vocabulary is redundant, but that the program simply reinforces students' notion that writing and revising is a drag.

For these reasons, *Quintilian* has no place in any undergraduate writing classroom. It may, however, have some use for researchers wanting to look at various features of students' writing.

Dr. Paula R. Feldman is an Associate Professor of English at the University of South Carolina in Columbia, South Carolina 29208. Her forthcoming book, *The Word Worthy Computer*, was written with Buford Norman, and will be published by Random House late in 1985 or early in 1986. Paula can be reached at (803) 777-2174. The *Quintilian Analysis* was developed by Winston Weathers and Joe H. Nichols in 1982 and is published by Joseph Nichols Publisher, P.O. Box 2394, Tulsa, OK 74101.

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—B.A.M.

The Scholar's Software Library

Bryan Pfaffenberger

Program:	<i>Notebook II</i>
Available From:	Pro/Tem Software 2363 Boulevard Circle Walnut Creek, CA 94595 800-826-2222 (In California call 415-947-1000)
Requires:	IBM Personal Computer, IBM PC XT, IBM PC AT, or IBM PC-compatible with Dos 2.0 or higher; 256K and two disk drives. Also available for Hewlett-Packard 150. (Earlier version, <i>Notebook 1.3</i> , still available at \$150 for a wide variety fo MS-DOS and CP/M systems.)
Price:	\$189.00

Notebook II—a text-oriented, file-management program from Pro/Tem Software—is almost without peer in today's software world. Once you find out what this program can do, it's my guess that you'll want a copy—fast.

“Text-oriented, file-management program” sounds like a lot of computer mumbo-jumbo, but once all the terms have been defined, they accurately sum up this program's nature. *File-management software* (FMS) refers, in general, to programs that let you set up a file of **data records**, or electronic versions of index cards. Each data record contains **data fields**, or areas for specific types of information, together with **headings** that you supply. (If you think of a three-by-five bibliography index card as a record with separate fields for the author, title, publisher, etc., you'll have the idea.) The program gives you tools to **manage** the information in the file—that is, to **sort** the records into alphabetical order, to **search** the information to find just the record or records you're looking for, and to **print** the information.

Most file-management programs are designed for business applications (such as maintaining inventories or customer addresses), and as such their text-storage capabilities are sharply limited. But *Notebook II* is **text-oriented**. It's specifically designed for the storage and retrieval of moderately long units of text. Each *Notebook II* data record can hold approximately 30,000 characters and contain up to 50 data fields, a significant improvement over earlier versions of the program.

Creating a *Notebook II* database is exceptionally easy. The database-creation mode lets you type in headings for the data fields simply and quickly. Unlike other file-management programs, *Notebook II* does not require you to specify in advance how large the fields should be; they dynamically expand and contract as you add and delete text in them. Figure 1 shows the data field headings for a bibliographic data base.

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KEY:	:
CITATION:	:
ABSTRACT:	:
DESCRIPTORS:	:
IDENTIFIERS:	:
HOLDINGS:	:
CALL NUMBER:	:
GET?:	:
READ YET?:	:

Figure 1: Headings for *Notebook II* Data Record

Just what kind of information these data fields should contain will be made clearer below, but for now here's a completed data record (Figure 2). Adding the necessary information is easy; *Notebook II* has its own, built-in word processor that's closely resembles the old *WordStar*. If you know *WordStar*, you already know how to use *Notebook*. Automatic word-wrapping makes it unnecessary to worry about the right margin. If you type a word that would go over the right margin, *Notebook II* automatically creates a new line in the data field and positions the word at its beginning.

KEY:	MacKenzie 1984
CITATION:	MacKenzie, Alan T. (ed.), <i>A Grin on the Interface: Word Processing for the Academic Humanist</i> . New York: The Modern Language Association of New York, 1984.
ABSTRACT:	An engaging and clear, if now somewhat out of date, introduction to word processing for scholars. Covered are: overcoming computer anxiety, the advantages of word processing, the elements of a computer system for word processing, and other introductory level topics. Carolyn Heilbrun's essay "Some Words for the Trepid" (Ch. 1. pp. 1-9) is an outstanding "read this first!" piece.
DESCRIPTORS:	word processing, scholarship, scholarly journals, scholarly editions, academic departments
HOLDINGS:	personal collection
CALL NUMBER:	n/a
GET?:	have
READ YET?:	yes

Figure 2: Completed *Notebook II* Data Record

Here's a brief account of how one might use *Notebook II* to search this database. *Notebook II*'s menu-driven (and, in consequence, easy-to-use) search utility gives you the necessary tools to construct complex search questions using logical operators such as AND, OR, and NOT. One could search, for instance, for *all the data records that con-*

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tain the text **WORD PROCESSING** in the abstract field **AND** contain the text **WORDSTAR** in the identifier field. The program would show you *only* those records that meet *both* criteria, creating a view of the database—a subset of the entire collection containing only the records that you want to see. You may then print these records for reference.

If you're feeling a growing sense of excitement about what you can do with *Notebook II*, you're on the right track. Using the database format shown in the figures, for instance, you can ask the program, in effect, to "Show me the works on word processing and scholarly editions that I haven't read yet," or "Show me the works I want to get on *WordStar* that are shelved in the Main Library." The program's equally approachable sort and print utilities let you further refine the information. Having seen the view containing the works on *WordStar* in the Main Library, for instance, you can ask *Notebook II* to sort and print them in alphabetical order using the **CALL NUMBER** field as a key.

Notebook II's flexibility and power stems directly from the provisions it gives you for defining multiple data fields. In the above figure, for example, the fields **DESCRIPTORS** and **IDENTIFIERS** both contain text describing the work's subject, but the **DESCRIPTORS** field uses general subject terms (*word processing, academic departments*) while the **IDENTIFIERS** field uses specific ones (*WordStar, Word II*). That way, you can search broadly for all the works pertaining to a general descriptor, or narrowly for just the ones that mention a particular identifier. You can define up to 50 fields, although most databases will need no more than one dozen.

Notebook II's multi-field provisions give you tight control of the information in the database, but there's a price to be paid. Like most file-management programs, *Notebook II* searches the data records sequentially, one after the other. That means, in practice, that the longer your database gets, the longer it takes to search it (and sort it). On my hard-disk system, *Notebook II* takes well over a minute to search 300 bibliographic records; search times on floppy-based systems would be several times longer. Moreover, *Notebook II* limits database size to about 50K less than disk capacity.

Notebook II's performance falls far below the high standard set by free-format programs such as *ZyIndex* or *SuperFile*, which permit you to set up massive textual databases even on floppy-based systems (a single *SuperFile* database, for instance, can be distributed over 255 floppy disks) and search them at speeds of 100 data records per second or more. But these programs don't let you set up multi-field data records and, in consequence, don't give you *Notebook*'s kind of pinpoint control over the information they contain.

Notebook II, in sum, is best applied to textual databases of moderate size—such as a scholar's annotated bibliography—rather than massive textual databases (such as thousands of pages of court transcripts). On a 360K floppy-based system for instance, you could probably create a bibliographic database containing about 750 to 1000 bibliographic citations. On a hard-disk-based system, you could create a database of two or three thousand pages of field notes. For larger textual databases, you'll be better off with a free-format program such as *ZyIndex* with its super-fast search speed.

There's an additional reason to recommend *Notebook II* for bibliographic database management besides moderate database size: the program *Bibliography*, another Pro/Tem product. *Bibliography* costs \$99.00 by itself, but if you buy it when you buy *Notebook II* you'll pay \$75.00. *Bibliography* automatically constructs an alphabetized reference list from key names placed in a text file.

Here's how *Bibliography* works. When you're writing a paper and you've just cited a work you want included in your reference list, for example, you simply place the key name *MacKenzie 1984* prefaced with a marketing character (%MacKenzie 1984) in your paper. After you're finished, *Bibliography* "reads" the text file, constructs a list of the key names, looks in the *Notebook II* database for the key name, extracts the full citation, places the citations in a text file, and sorts them in alphabetical or numerical order. *Bibliography*, in short, completely automates one of the more tedious tasks of scholarly writing.

The *Notebook III/Bibliography* team makes an unbeatable pair for managing bibliographic information, but that's not the only application *Notebook II* can handle. A college teacher, for instance, can use the program to set up a database of lecture notes and test questions. An archivist can create a customized guide to a collection. You can

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create mailing lists, a database containing notes on journal style requirements, index teaching materials, maintain consulting client records, and more.

Notebook II's versatility and power make it clearly preferable to almost all dedicated database management programs, or programs set up to perform just one function such as maintaining test-item banks, creating a mailing list, or storing bibliographic citation. Just one purchase—*Notebook II*—gives you all these tools, and more, so long as you're willing to design your own data records. That's easy to do, and what's more, you can customize the database to suit your needs.

Notebook II is a robust, smooth-running program that's exceptionally easy to use. If you've been put off by the notorious complexity and unfriendliness of database-management programs, you'll find *Notebook II* to be a refreshing exception. The program comes with a disk-based tutorial and a well-written manual. If you're working with textual material of moderate length and believe a text-oriented database program can help you, *Notebook II* belongs in your software library.

Contributing Editor **Bryan Pfaffenberger** is a writer and anthropologist who teaches in the Division of Humanities, School of Engineering & Applied Science, University of Virginia. He's the author of *The College Student's Personal Computer Handbook* and *Macintosh for College Students* (both published by Sybex Computer Books). His more recent *The Scholar's Personal Computing Handbook: A Practical Guide*, will be published early in 1986 by Little, Brown and Company; he is currently working on *Dynamics of Microsoft Word* for Dow Jones/Irwin. Comments and dialogue are welcome; contact Bryan at 218 Sunset Ave., Charlottesville, VA 22903.

Manuscript Submissions Welcome

The *Newsletter* welcomes article submissions that pertain to word-processing, text-analysis, and research applications in professional writing situations. Also, hardware and software reviews are accepted, but please contact Dr. Jim Schwartz, Hardware/Software Review Editor, before submitting them (call Jim at 605-394-1246). Manuscripts either may be submitted as hard copy or on 5¼" diskettes using *WordStar (3.xx)*, *Leading Edge Word Processor*, or standard ASCII code. If submitting disks, please make sure they are formatted either in MS-DOS, PC-DOS, or a popular CP/M format (Kaypro, Zenith, etc.) The Editors reserve the right to edit manuscripts, if necessary. If you want your manuscript or disk returned, please send enough postage to cover the return along with a self-addresses envelope. Address all correspondence to the Editors, *Research in Word Processing Newsletter*, South Dakota School of Mines and Technology, 501 E. St. Joseph, Rapid City, SD 57701-3995. The Editors may also be reached on *CompuServe* (70177,1154) and the *Source* (AAH500)

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