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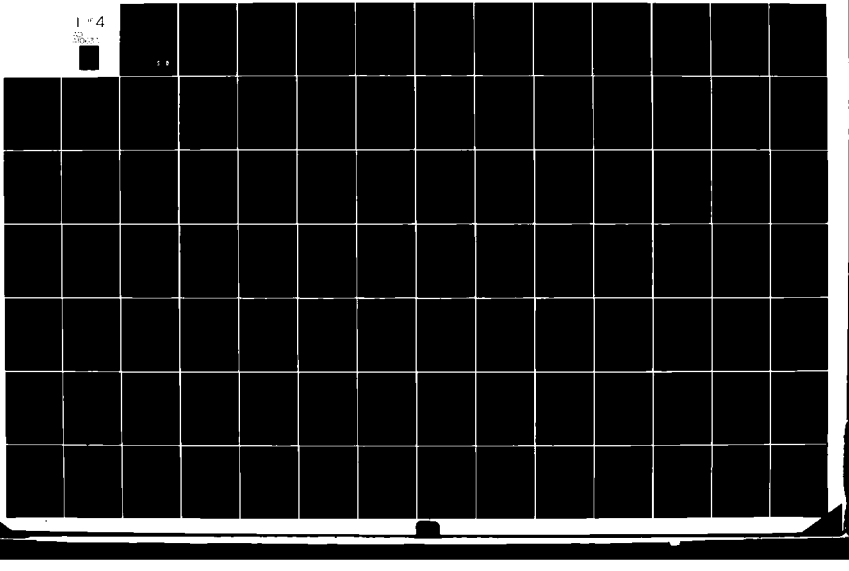

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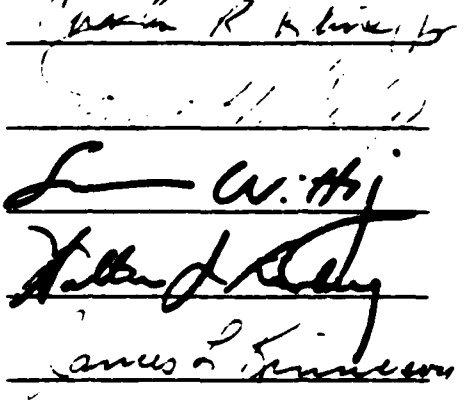

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To Mary

# STIMULATING RHETORICAL INVENTION IN ENGLISH COMPOSITION THROUGH COMPUTER-ASSISTED INSTRUCTION

by

HUGH LEE BURNS, JR., A.A., A.B., M.A.

DISSERTATION

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

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THE UNIVERSITY OF TEXAS AT AUSTIN

August 1979

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STIMULATING RHETORICAL INVENTION IN ENGLISH COMPOSITION THROUGH COMPUTER-ASSISTED INSTRUCTION

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Supervising Professors: Charles R. Kline, Jr.
George H. Culp

The impulse for this research was to combine the renewed interest in teaching invention--the process of exploring a subject to discover ideas or arguments--with the developing technology of instructional computing. The first of three major conclusions was that "open-ended" or exploratory, supplementary computer-assisted instruction (CAI) which encouraged growth in the number and the sophistication of ideas could be programmed. The second conclusion was that a systematic inquiry using one of three popular heuristic methods made the experimental groups more alike with respect to the quantity and quality of their ideas and significantly different ($p < .0001$) from a control group.

The third conclusion was that the computer-administered, posttest methodology represented a more stringent way for controlling and later replicating quasi-experimental research in rhetoric.

The three heuristic strategies selected for the CAI modules were Aristotle's enthymeme topics, Burke's dramatistic pentad, and the Young, Becker, and Pike tagmemic matrix. Sixty-nine students in four freshman composition courses participated in the experiment.

Hypotheses concerning quantity of ideas found that (1) significant individual gains ($p<.001$) occurred within each experimental group while the control group members experienced a significant decrease ($p<.02$), and (2) no significant difference occurred among the heuristic groups while a significant difference ($p=.000$) was found among the four groups. Hypotheses concerning quality found that (1) individuals in all four groups achieved gains, though those in the control group lagged behind the gains experienced by the members of the experimental groups, and (2) a significant difference ($p=.000$) favored the experimental groups in insightfulness, comprehensiveness, intellectual processing, and overall quality. A significant difference ($p=.037$) was discovered concerning the elaboration rates--the *topoi* method being the most

likely to sustain an inquiry and the Burke pentad being the least likely. No significant difference appeared among groups with respect to the arrangement of composition plans or to the internalization of heuristic strategies. Finally, students strongly agreed that these CAI-invention modules made them think systematically about their own writing process.

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# CHAPTER 1

## A Problem to Find, A Problem to Prove

"A reasonable sort of heuristic cannot aim at unfailing rules; but it may endeavor to study procedures (mental operations, moves, steps) which are typically useful in solving problems. Such procedures are practiced by every sane person sufficiently interested in his problem. They are hinted by certain stereotyped questions and suggestions which intelligent people put to themselves and intelligent teachers to their students. A collection of such questions and suggestions, stated with sufficient generality and neatly ordered, may be less desirable than the philosophers' stone but can be provided.
--G. Polya

The Problems

Within recent years, many English composition teachers have returned to a fuller rhetorical model for teaching writing. Consequently, they have searched for methods of stimulating invention, the first rhetorical art, in their composition courses. Invention, from the Latin inventio, or heuristic, from the Greek heuresis, is the process of exploring a subject to discover ideas, arguments, or propositions--those features which one must know in order to write convincingly about a subject.

Richard Young, in his bibliographical essay entitled "Invention: A Topographical Survey," (1976) describes the process this way:

> Every writer confronts the task of making sense of events in the world around him or within him--discovering ordering principles, evidence which justifies belief, information necessary for understanding--and of making what he wants to say understandable and believable to particular readers. He uses a method of invention when these processes are guided deliberately by heuristic procedures, that is, explicit plans for analyzing and searching which focus attention, guide reason, stimulate memory and encourage intuition. (p. 1)

Since all writers must discover suitable, factual, and interesting information, acquiring specific methods of inquiry, or heuristic strategies, ought to make them

more efficient early in the writing process. This efficiency refers not only to the rate of gathering or discovering ideas, but also to the quality of those ideas--their insightfulness, their comprenensiveness, and their usefulness.

An ancient Arabian anecdote, as retold by Robert E. Ornstein in The Psychology of Consciousness (1972), illustrates the common dilemma writers face when they begin writing before having thought through their unique writing problem:

> A man saw Nasrudin searching for something on the ground.
> "What have you lost, Mulla?" he asked.
> "My key," said the Mulla.
> So the man went down to his knees too, and they both looked for it.
> After a time, the other man asked: "Where exactly did you drop it?"
> "In my own house."
> "Then why are you looking here?"
> "There is more light here than inside my own house." (p. 187)

All writers at some time have shared Nasrudin's predicament. Like Nasrudin, students often feel obliged to look outside where the light is, even though they suspect, sometimes even know, that what they are looking for is not outside in the light but inside in the dark. It is not necessarily bad for them to use outside light, but they must first be taught to bring the light into their own houses. Stimulating invention in English

composition is only a means toward this homecoming, for learning invention strategies facilitates fruitful discoveries. While any discovery is worthwhile, the process of discovering what to say can be the result of planning and conscious effort, not just the result of random luck and happenstance collisions of mind and matter.

Certainly, English instructors are well aware of students' pleas for help when it comes time for them to select their composition topics. Moreover, most instructors recognize that nothing should be more individualized than each student's respective exploration of a subject. This concern for developing and nurturing the thinking expertise of student writers is not always adequately demonstrated in the classroom, however.

Although the Dewey problem solving steps were once common fare in many English texts, today problem solving techniques or heuristic strategies are not often systematically taught in most secondary and college English curricula. Not that instructors have assumed that students have mastered ways to inquire about subjects and to explore many potential ideas: it is rather that they are not sure <u>how</u> best to nurture systematic inquiry.

This problem anticipates the major assumption for developing supplementary instruction in invention: namely invention, prewriting, or "thinking about a topic" are ideas English teachers often use recklessly in the composition classroom. The primary cause for this recklessness may be not providing the students with explicit methods of inquiry, and the primary effect, again, may be students' pleas for help: "I don't know what to write about!" "I guess it's just not a very good topic!" or "What can I say about it, do you think?" Granted, a teacher cannot teach insight--what ultimately must be the student's own personal, quite private journey toward understanding--and obviously, composition instructors cannot predict what the students will discover. Nevertheless, they can prompt students to make discoveries. They can provide systematic strategies or procedures. Again, Richard Young describes certain aspects of the invention process which can be taught:

> The procedures themselves can be taught, as can their use in conscious thought; but one cannot teach direct control of the imaginative act or the unanticipated outcome. What can be taught is not, however, trivial; no one would question the importance of careful thought in the composing process. Furthermore, the use of heuristic procedures can coax imagination and memory; the intuitive act is not absolutely

> beyond the writer's control; it can be nourished and encouraged. (pp. 1-2)

Nourishing and encouraging intuitive acts as well as coaxing students' imaginations and memories are most certainly activities which reach far beyond the English composition classroom. Such are the problems composition teachers must prove in teaching invention.

## The First Proposition

The remedy, as already suggested, is to teach explicit methods of inquiry, particularly those constant features of heuristic systems. Such a suggestion, of course, is not novel. Plato advocated explicit strategies for inquiry, as when Socrates tells Phaedrus:

> Isn't this the way to reflect about the nature of anything? First, is it simple or complex, this knowledge about which we shall wish to have scientific knowledge ourselves and be able to produce it in others? Next, if it is simple, we must investigate what capacity it may have in its own nature to act on something correlate to it, and what is that something? And what capacity does it have for being affected by a correlate, and what correlate may this be? Or if it's complex, we must count its parts and notice in the case of each of them what we observe in the case of the simple object, applying to each part the questions: on what is its nature to act? By what is it affected? What is the nature of this affection? . . . At any rate, any other procedure would be like

> blind man's progress. And to be sure, no scientific inquirer should have any resemblance to the blind or to the deaf. (Phaedrus, 1956, pp. 61-62)

Nor has Plato been alone in stressing the importance or supremacy of systematic inquiry. Descartes' fourth rule for the direction of the mind puts the matter simply--"There is need of a method for finding out the truth" ("Rules for the Direction of the Mind," 1969, p. 44). John Dewey finds scrupulous investigations pleasurable:

> A disciplined mind takes delight in the problematic, and cherishes it until a way out is found that approves itself upon examination. . . . The scientific attitude may almost be defined as that which is capable of enjoying the doubtful; scientific method is, in one aspect, a technique for making a productive use of doubt by converting it into operations of definite inquiry. (The Quest for Certainty, 1960, p. 228)

Heeding such advice, therefore, let us ask, "what is the nature of invention?"

Excluding the insight, there should be relatively few surprises in invention, for the static construct in invention, and in heuristics generally, is the system. Frank J. D'Angelo (1975) correctly insists that "invention always seems to take place within a system" (p. 53). He elaborates:

> There is always some kind of structure underlying the process. To invent is to extend a system which is already present in the mind. . . .
>
> The subconscious mind usually provides the design for the composing process, and the conscious mind provides its development, although the reverse is possible. Actually, this is an oversimplification since there is a constant interplay between two modes of consciousness. Since the subconscious part of the mind is not always accessible, the writer must aid the subconscious as much as possible by a deliberate and conscious effort, by defining the problem, by filling in the details, by carefully working out the design, in brief, by preparing the mind so that the subconscious can take over. The old truism that invention favors the well prepared mind seems to be an accurate one. (p. 53)

Indeed, what can be taught are the systems themselves, then, additionally, extending the systems, combining the systems, and generating other personal systems. Since freshman writers might not have articulated their conscious systems of inquiry, composition teachers might begin by teaching some of the more well-known heuristic systems. This assumption suggests that freshman composition students can be taught "non-data conditioned" heuristics so that they can be originally and consciously aware of at least one particular method of inquiry. Thus, with such considerations, this research problem was half-delineated: composition teachers interested in grounding their research on current rhetorical theory

and in teaching systematic procedures for thinking must first understand the nature of invention and then design, test, and evaluate invention instruction.

## The Second Proposition

The second half of the problem grew partly out of a methodological difficulty of isolating and collecting each individual's actual thinking process and partly from a fascination with the emerging technology of computer-assisted instruction (CAI)--specifically, the possible implications which research in individualized instructional systems, artificial intelligence, and man-machine problem solving could have on the teaching of rhetoric. In recent testimony about computers and the learning society before the Subcommittee on Domestic and International Scientific Planning, Analysis and Cooperation of the Committee on Science and Technology (1978), one recurring theme, here enunciated by John S. Brown of Bolt, Beranek, and Newman, was integrating the computer as a cognitive tool in education: "The unique quality of the computer that does make possible a revolution is that it can serve as a cognitive tool. It can be an active agent--a servant, assistant, consultant or coach--in a way that books and

television cannot" (p. 300). Composition teachers and rhetoricians certainly used such passive cognitive tools as books and television, but virtually no rhetorical instruction or research had anticipated the certain advantages that computers could provide while actively prompting human beings to inquire, to think, to explain, and to understand. Three advantages come quickly to mind.

First, stimulating invention through computer-assisted instruction offered a unique setting for studying, collecting, and describing what ultimately was the most individual behavior in the entire composition process--the discovery and the first formulation of ideas. Second, well-conceived, computer-assisted invention could be a viable, supplementary tool for composition teachers to add to their pedagogical repertoire, for actually having to give individual instruction about every conceivable subject a student might write about in a semester would certainly be mentally, if not physically, exhausting. Third, using CAI as the independent variable in a specific research design would not only strengthen the experimental control, but also allow further replication and continued development.

The impulse for this research, therefore, was to combine the fruits of the rhetorical renaissance in English composition with this developing technology of instructional computing. From this impulse, the major question evolved: could supplementary computer-assisted instruction be designed, developed, and programmed which would effectively stimulate most individual's inventive process? Ultimately, the specific objective became to design, program, test, and evaluate three CAI modules for stimulating rhetorical invention within the freshman English composition setting.

## Developmental Considerations -- Invention

Ever since the publication of Research in Written Composition (1963), researchers in English composition have been critically examining the design and the data-gathering techniques of their empirical scholarship. The list of unexplored research questions Richard Braddock, Richard Lloyd-Jones, and Lowell Schoer offer include a few which relate to the problem in the present study:

> 1. What kinds of situations and assignments at various levels of schooling stimulate a desire to write well?
> 8. At which levels of maturation does it seem appropriate to introduce the various rhetorical elements of writing?
> 10. What are the direct and indirect effects of particular sensory experiences and guided observation upon writing?
> 18. Can formal study of rhetorical theory or of logic help writers?
> 22. How does a person go about starting a paper? What questions must he answer for himself? (pp. 52-53)

Answering these questions generates the first two considerations for this research. The first is to create and evaluate computer-assisted instruction in invention in order to discover whether or not CAI offers a suitable learning environment and an appropriate "sensory experience" for generating ideas by freshman English composition students. The second consideration is to measure the extent, if any, to which students can more effectively begin a paper if they understand that their creative processes and formal, systematic, heuristic processes mutually reinforce each other. This attempt to create a scientific setting for the study of invention responds to the challenge Braddock, Lloyd-Jones, and Schoer issue in their summary:

> If little has been proven about the instructional factors influencing composition, it is fair to say that almost nothing has been proved in a scientific sense about the rhetorical aspects of written composition. By "rhetorical" is meant here those aspects of writing which (to simplify somewhat) are larger than the unit of the sentence -- in expository writing, for instance, the main idea and its analysis; the support of subordinate ideas with details, examples, statistics, and reasons; and the organization of the previous elements into an orderly and meaningful whole. It is a challenge to investigate these aspects of writing in a scientific way. (p. 38)

Consequently, Braddock, Lloyd-Jones, and Schoer conclude that most of the rhetorical considerations in composition research are unexplored territory. Despite the intervening fifteen years, a great many rhetorical considerations remain unexplored, though the thinking, the defining, and the urging have continued.

Among the general studies which have attended exclusively to the realm of invention are Janice M. Lauer's "Invention in Contemporary Rhetoric: Heuristic Procedures" (1967) and Tommy J. Boley's "Rhetorical Invention: A Synthesis of Contemporary Concepts" (1972). Both describe, classify, and evaluate specific discovery procedures which have emerged in the English composition curriculum, and each offers another major consideration for this research.

Briefly, Lauer's dissertation investigated "the contribution psychology has made toward an understanding of creative problem-solving and heuristic procedures" (p. 1). With regard to this research, one of the important ideas she uncovered in psychological studies was that training in heuristic strategies had, with some significance, improved general problem solving abilities. She writes:

> A final contribution of psychologists which occurs both explicitly and implicitly in the discussion of the heuristic strategies in problem solving is their ability to be trained. Many of the psychologists who are working in creative problem solving are interested not only in knowing what activities occur within creativity but also in determining what training in creative problem solving is possible. Obviously, this consideration is very important to rhetoric. Some teachers of composition have concluded that writing is not teachable. The conclusions that psychologists have come to in this regard are important, therefore, for any heuristic models proposed for writing. (p. 28)

As the nature of cognitive psychology overlaps other human endeavors, the nature of rhetoric also overlaps, even encompasses, other human endeavors. Lauer's study leaves no doubt about this matter. Moreover, by attending to research in one, we simultaneously enrich our understanding of the other. The third major consideration, therefore, was to construct the

computerized invention instruction to be consistent with the lines of inquiry in the theoretical psychological research--in particular, research about the nature of creativity and theories involving intersecting matrices (Koestler, 1964).

Four years later, Boley noted in his dissertation that "the emphasis on writing as a 'process' initiates a controversy between the rhetoricians who advocate the use of a 'topical' system, which can supply a writer with lines of reasoning for the support of his proposition, and the rhetoricians who advocate the use of a 'discovery' approach, which can enable a student to find material about a subject that will lead to the creation of new concepts" (pp. v-vi). The synthesis of these invention heuristics, Boley argued, can be achieved by selecting the appropriate method of invention according to the aim and the mode based upon James L. Kinneavy's A Theory of Discourse (1969). Boley, therefore, (1) amplifies the logical systems of the various kinds of discourse, where Kinneavy writes of invention; (2) compares and illustrates the similarities of the tagmemic approach and the modes of description, narration, and classification; and (3) discusses four practices which limit the composition curriculum: (a) limiting the

kinds of writing to specific kinds of discourse, (b) omitting invention all together, (c) assigning particular/exclusive subjects, and (d) pre-establishing form or structure of writing. Thus, Boley argues not so much for a grand synthesis of heuristic as his title might suggest, but rather clarifies the distinction among heuristics so that a writer can appropriately match heuristic to aim and mode. He also urges the composition teacher not to limit the range of invention. The implied difficulty here is that most composition teachers have not yet trained themselves to tie specific cognitive inquiry strategies to a comprehensive theory of discourse. Nevertheless, his remaining research questions dealt with whether or not the heuristics actually behaved as they are theoretically supposed to behave in the freshman composition setting. The important developmental considerations were (1) to design the computerized invention modules to emphasize the student's aim in writing, or at least help the student discover his or her purpose for writing while engaged in the instructional sequence, and (2) to attempt to verify if heuristics would differ as a result of selected aim and mode.

Finally, Richard E. Young in a recent essay entitled "Paradigms and Problems: Needed Research in Rhetorical Invention" (1978) likewise calls for research on the competing theories. He writes:

> The research needed at the moment is research that helps us make reasonable judgments about the adequacy of the theories of invention we have been discussing [classical invention, Burke's dramatistic pentad, Rohman's prewriting method, and Pike's tagmemic invention]. Two general questions need to be asked of each:
>
> 1. Does it do what it claims to do? That is, does it provide an adequate account of the psychological processes it purports to explain? And does it increase our ability to carry out these processes more efficiently or effectively?
>
> If the answer is negative, we must decide whether to drop the theory from further consideration; the decision, however, must be made cautiously since the answer may result from causes other than defects in the theory.
>
> 2. Does the theory provide a more adequate account of the processes and more adequate means for carrying them out than any of the alternatives?
>
> Again, assuming that the research is reliable, a negative answer would make it difficult to continue regarding the theory seriously. (pp. 39-40)

Both of Young's questions are especially appropriate for, with few exceptions, specific invention strategies or heuristics have not been systematically taught in

English composition and, therefore, could not be systematically evaluated. The final consideration of this research addresses his first point--do heuristics do what they claim?--by collecting invention sequences and evaluating three instructional modules derived from three of the more popular heuristic procedures. Specifically, the three CAI modules are based upon (1) Aristotle's twenty-eight enthymeme topics, (2) Kenneth Burke's dramatistic pentad, and (3) Young, Becker, and Pike's tagmemic matrix, in particular the particle, wave, and field perspectives.

## Developmental Considerations -- CAI and English Education

Since the early sixties when computer-assisted instruction evolved and extended the range of individualized instruction in American education, English educators have yearly become more and more intrigued with computer applications both in their classrooms and in their research. Articles from professional journals in the sixties were often preoccupied with features on teaching machines and programming instruction. Such articles did not have a great deal to do with actual computer-assisted

instruction, but they signaled a gradual acceptance, perhaps reluctant acceptance, of systems approaches to instruction. Since then, the state of the CAI art in English education has advanced considerably on all levels of instruction--but not without considerable debate.

In the October 1975 issue of College Composition and Communication, Ellen W. Nold's brief article entitled "Fear and Trembling: The Humanist Approaches the Computer" summarized over fifteen years of technological anxiety and represented, in many respects, a mandate for English educators to "put their best efforts into writing instructional programs" (p. 269). Nold writes:

> Spinoza points out that "so long as a man imagines that he cannot do this or that . . . so long will it be impossible for him to do it." What is preventing humanists from using the computer for humanitarian purposes is merely their belief that they cannot use the machine. It is ironic that a group known to undertake calmly and surely the study of Latin, Greek, Russian, Chinese, Swahili, or Gaelic often balks at the much simpler task of learning the more logical, far less capricious, language of the machine. (pp. 272-273)

Her remarks attacked those who would contend that the computer would eventually dehumanize the humanities.

For some, the fear and the trembling resulted in English departments because the computer was another way to clone English teachers. Such was Ken Macrorie's (1970) reaction to one computer program when he christened the computer, Percival.

> Percival incarnate is a monster who helps us see the English teacher incarnate--a cultivated, liberal, well-intentioned pusher of the life of the mind and feelings, dedicated to promoting moving and memorable expressions of the complexities of life. With his bloody marks in the margins of themes. With his refined and polite comments, like this one by Percival:
>
> Well, Johnny H. Doe, it was nice to talk to you and to read your essay.
>
> It was not nice to look at Johnny's carefully prepared dead body of a theme, cleaned of all the dirt of the street and the lines of experience around the eyes, inflated with abstract pedantic words, depersonalized with pseudo-objective phrases that rendered it like every corpse submitted to teacher.
>
> Percival had carried out a monstrous act for his masters, asking Johnny to say something so valuable on paper that it was worth study and care and criticism, and yet depriving him of a true voice in which to say it. (pp. 6-7)

Certainly Macrorie makes the point that the computer can only do what English teachers do. He concludes, "The researchers knew English teachers, all right. They set up their computer to act like one" (p. 4). Simply the computer is a tool of the English instructor--nothing more, nothing less--a tool which necessarily reflects the educational philosophy of the instructor.

For this research, the major instructional computing consideration evolved from merely thinking about consequences. In other words, before English educators allow the computer to dehumanize their students, ought not these educators attempt to humanize the computer? If the humanities must suffer computer-assisted instruction, would not it be better for humanists to create the world they must suffer in? Edmund J. Farrell in English, Education, and the Electronic Revolution (1967) offers a cautiously worded recommendation:

> Whether one believes the electronic revolution will have deleterious or beneficial consequences for mankind, he cannot ignore it. Even those most concerned with its potentially destructive effects upon human values readily admit that the process is irreversible: one cannot halt cybernation; one may only hopefully contribute to its intelligent control. What ultimate--if one can use such a word--effects the revolution will have waits to be known. . . . (p. 11)

Among those computer programs in composition which have attempted "intelligent" contributions are those which have freed the English teacher from those repetitive drill and practice sessions about syntax, spelling, usage, passive constructions--programs which deal with matters of rhetorical style. Thus far, little effort has been expended on appropriate CAI for rhetorical

invention and arrangement. Basically, the single consideration was simply to "do it"--develop and program invention sequences. With the exception of Ellen Nold's (1975) "discovery and surprise" program, there have been no documented attempts to stimulate rhetorical invention through CAI.

Overall, therefore, the computer in the composition class has not made nearly the impact that it has in the science and mathematics classrooms. A sample of the literature reveals that English educators are being urged to (1) use the computer to relieve them of time-consuming administrative tasks; (2) create basic English programs in grammar and syntax; (3) humanize the tone of the instruction in poetic forms, usage matters, and editing; (4) establish literary data bases to supplement literature courses; and (5) design programs to read and, perhaps, grade compositions.

Peter M. Illick and Kenneth B. Taylor (1974) hint that some initial reluctance by humanities faculities to supplement classroom learning exists because of the depersonalizing nature of programmed instruction. Such a fear, they contend, might in fact really be apprehension about how to apply the computer-assisted instructions to the process of writing. These two authors, however, do not approach

the dilemma directly in their article, "Computers and College Composition." Rather, they skirt the issue and argue generally that "English departments have been reluctant to consider the advantages made available by their campus data-processing centers" (p. 27). In other words, computers can relieve English teachers from many time-consuming tasks so that they can move to other more profitable academic pursuits. While their point is valid, they do not address specific CAI modules in grammar, editing, organization, or argumentation.

The majority of the instructional computer programs in English education have been drill and practice in the basic writing skills. Within the next few years, CAI designed to help prepare high school students for college composition courses should be readily available. Likely areas of concentration will be diction, sentence patterns, transitions, and standard punctuation. One such interactive sequence was funded jointly by the National Science Foundation and the University of Texas at Austin. The seven-module course, DIALOGUE, was designed by Susan Wittig and adopted in the writing laboratory version of the first-semester of freshman composition. In a recent article in Pipeline, Wittig summarizes these programs:

> The theoretical approach to the teaching of syntax that has been adopted in the design of the modules was based upon the transformation-generative sentence-combining work of Kellog Hunt and Roy O'Donnell. In order to minimize terminological confusion, however, this presentation to the students is made in terms of the more traditional grammar with whic they are more likely familiar. These modules are written for non-remedial students and for students without severe dialect problems; they do not, for instance, teach verb tense patterns or pronoun-antecedent agreement. They stress the sentence patterns of written English, because many students are relatively unfamiliar with those patterns, although they may be orally competent. (p. 20)

The basic sequence has the student complete a few instructional exercises, take a competency examination on-line--usually two to eight questions--and, if necessary, receive some remedial work. The modules cover basic sentence patterns, nouns, adjectives, adverbs, coordination, appositives, and adjective clauses. Such programs supplement the work in composition; they do not replace a composition course. Consequently, for these programs to be effectively integrated into the composition curriculum, a "climate of acceptance" must be created within the English department. Wittig elaborates:

> For transport to be even moderately successful, . . . the (most) important requirement is the establishment of what might be called a climate of acceptance. This climate may be described as a willingness on the part of the faculty . . . to accept this new and expensive educational medium, to learn to use it to its fullest effectiveness, and to build courses around it that share at least some of the features of the philosophical and pedagogical base on which the programs are built. Without this climate of acceptance, transport is technologically possible, but educationally undesirable; at best, simply effective; at worst, disruptive to the delicate political balance within departments or colleges. . . . The transport of computer-based instruction is not an easy task: there are technical, educational, and political problems--but they can be resolved. (p. 22)

The problem of humanistic reluctance, as Wittig points out, is the first dilemma--even for the programs which teach, drill, and polish those basic writing skills which have been allegedly declining since 1963.

A presentation I gave, entitled "Humanizing CAI in English" (1978), represents the general type of article now appearing with greater frequency in professional journals. Such articles summarize specific computer-assisted instructions in English composition. In "Humanizing CAI in English", three specific programs are described:

1. Cinquain Generation--a program which teaches a student to write rich, imagistic, oriental verses.

2. Five Usage Toughies--a program which drills students with exercises illustrating the often perplexing differences between affect and effect, lie and lay, among others.

3. Brevity in Composition--a program which transforms the writer from a loving, tender, expressive human being into a lean, hungry, tooth-grinding, green-visored editor (a complicated metamorphosis, to say the least) by instructing a student to cut excess relative clauses, expletives, and jargon.

Another recent paper in this program summary format was delivered by Gayle Byerly (1978) at the Ninth Conference of Computers in the Undergraduate Curricula. The presentation entitled "Generating English Programs at a Small College" recounts the development and four-year evolution of three computer-assisted instructions featuring literature. The course which these three programs supplemented was designed to review "genre development through various periods and movements" and enable a student "to define key terms and major authors, develop a firm sense of chronology, and be able to show familiarity with a reasonable selection of significant works" (p. 127). While Byerly admits her

work with the computer at Ursinus College can hardly be considered a "massive project," she concludes:

> I feel that humanities teachers may indeed utilize the computer effectively by using enough programs to accustom themselves and their students to the technique, maximizing the required student thought input and minimizing the required student typing input, integrating computer materials with class work, and retaining the reasoned perspective and seasonable humor typical of the humanities field at its best. (p. 132)

Byerly's notion to combine the best of instructional computing with the best of the humanities cannot be overemphasized.

One of the most intriguing possibilities for using computers in the composition classroom is their application for theme grading and evaluation. As Arthur Daigon (1966) points out, the first question most English teachers ask is "How can a machine read and grade a composition" (p. 48)? Here the pedagogical implication is clear: a machine cannot read as critically as a teacher can. Such a reply is true to a degree, but such an argument may be countered, for in composition courses, how can one teacher read 130 to 150 themes in precisely the same frame of mind? No human being would be able to address or even find all of the important considerations in that many compositions. A computer can be programmed, however, to look for and to

comment upon the same details for all of these compositions; it would be consistently fair and perhaps even more thorough than many teachers have the time to be. Paul L. Briand (1977) writes:

> It is now possible, thanks to work done in California, Connecticut, Texas, Michigan, Illinois, and even Edinburgh, Scotland (to name a few), for a student to drop off his composition at the computer center, on his way home or to the dorm, come by on his way to class in the morning, and pick up a computer analysis of his composition which would out-do the average freshman English instructor or the harried graduate teaching assistant. As a matter of fact, such an analysis, far from dehumanizing the student, would personalize his writing problem and -- most *importantly--would* free up his instructor or graduate assistant to do the things they do best: use their creative intelligences to discuss such vital matters as selection of subject and narrowing to thesis, organization and development, usage and style--the very things the computer cannot do. (p. 4)

Again, the keynote is the use of the computer as a humane tool. At the very least, English educators should integrate a computer's capability to provide helpful, editorial feedback. Such an automated, formative evaluation would enable instructors to save their own humane, summative evaluations for those vital matters Briand suggests.

Today, developments in computer technology continue at a remarkable rate. The humanist must, therefore, see to it that the relationship between humanity and machine is a sound one. Our technological society and the educational system which serves it must be concerned with developing the thinking expertise of our students. Developing computer instruction which enables students to think about difficult, open-ended matters is within our grasp today. Developing computer instruction which enables both students and computers to discuss difficult, open-ended matters will soon be within our grasp. Undoubtedly, technology has emerged within the English curriculum, and many English educators have acknowledged that this newfangled machine will have a great impact not only on what they teach but also on how they teach it. Since a computer recognizes that students learn at different rates and can thus be programmed to account for such differences, computer-assisted instruction in invention will necessarily allow students to treat their individual subjects differently. The computer, well-programmed, gets to the heart of what is truly basic in education--a basic commitment as a society to the full development of every citizen's potential. In CAI-prompted invention, each student will have been exposed to a complete

strategy for exploring a subject and hopefully complete a well-reasoned, mature, thorough analysis of the topic. Needless to say, such a lesson well-learned in school should have great ramifications. Like the advances made in media-application in the English classroom over the last twenty years, the advances in computer-assisted instruction are certain to continue at a lively pace.

## The Heuristics

My aim in the following few pages is to acknowledge briefly the sources and summarize the corresponding research about the three heuristic methods selected for the CAI modules. What may first be conspicuous, however, are the heuristic methods which were not selected: predominant among them, Rohman and Wlecke's prewriting (1964), Toulmin's schematic model (1964), Christensen's generative rhetoric (1967), Larson's seven discovery groups and associated questions (1968), and Flower and Hayes's problem-solving strategies (1977). Not that these methods are any less helpful--frankly we do not know. Not that these invention strategies are incompatible with the CAI format either. Rohman and Wlecke's meditation steps (preparation, "points," and colloquies) as well as their

analogy "bisociations" would make provocative programs. Toulmin's logic is nothing if not systematically conceived and could be most useful in inventing and arranging persuasive discourse. Christensen's framing is most tempting for syntax-based invention schemes. Larson's questions are practically ready for CAI as they are, and, if students had already classified their respective subjects as "single items," "abstract concepts," "collections of items," etc., they could be immediately branched to the most appropriate inquiry. Flower and Hayes's "issue trees," particularly the manner in which they help a writer differentiate high- and low-level concepts, are tempting for their graphicness.

The primary reason, however, for selecting the topics, the pentad, and the tagmemic method was their current popularity. Since Lauer's (1967) evaluations of current rhetorical theories for their comprehensiveness and their efficiency, the "neo-Aristotelian" theory, Burke's theory, and the tagmemic model have accumulated some evidence that they are among the most powerful heuristic methods. In fact, Lauer's scale rates them at ten, twelve, and fourteen "total power" scores respectively (pp. 145-149). The distinctions among the three fell beneath the two criteria of simplicity and

sequence--Burke's pentad losing two points to tagmemics for simplicity; Aristotle's topics losing more legitimately four points to tagmemics for these categories. Still, such distinctions need to be verified, and other "operating" distinctions clarified and reported among these three systems. Needless to say, if this research prompts either other CAI-invention modules or evaluative research designs among heuristic methods, then it too has become a heuristic. As W. Ross Winterowd (1975) enjoys reporting, "My friend Richard Young . . . once said to me, 'Rhetoric is a fascinating discipline precisely because everything remains to be done'" (p. 37).

Aristotle's Topics. Among the tools of invention in classical Greece and Rome, the topoi were the most prominent. Since the purpose of classical rhetoric was to persuade, lists of topoi helped an orator discover arguments. Knowing specific tactics and being able to select strategies for interpreting and persuasively presenting ideas was important. In the strictest sense of the words, rhetorical invention did not mean discovering what was unknown but rather retrieving appropriate arguments for any persuasive situation. Consequently, the classical rhetorical

treatises or handbooks assembled substantial lists of topoi--Aristotle's list perhaps being the most well-known.

The CAI questions based upon Aristotle's enthymeme topics are adapted from his Rhetoric, specifically Book II, Chapter 23: 1397a17-1400b35. At this point in the Rhetoric, Aristotle writes that it is time for his readers to "lay hold of certain facts about the whole subject, considered from a different and more general point of view" (p. 142). Again, remembering that when Aristotle writes of invention he is most concerned with enabling one to discover the most suitable argument for persuading an audience, most of his explanations are really examples of how a select topic may be applied in a certain situation. His illustration of simple consequences, his thirteenth formal topic, is such an example:

> Since it happens that any given thing usually has both good and bad consequences, another line of argument consists in using those consequences as a reason for urging that a thing should or should not be done, for prosecuting or defending any one, for eulogy or censure. E.g., education leads both to unpopularity, which is bad, and to wisdom, which is good. Hence you either argue, "It is therefore not well to be educated, since it is not well to be unpopular": or you answer, "No, it is well to be educated, since it is well to be wise." The Art of Rhetoric of Callipus is made up of this line of

> argument, with the addition of those of possibility and the others of that kind already described. (pp. 149-50)

Stripping away the examples from the twenty-eight topics enables us to see their inherent heuristic power. The enthymeme topics are:

1. opposites
2. inflections, "modification of the key-word"
3. correlative terms, correlative ideas
4. a fortiori--"if a quality does in fact exist where it is more likely to exist, it clearly does not exist where it is less likely."
5. considerations of time
6. utterances made by your opponent against you and now turned against him--"the purpose is to discredit the prosecutor."
7. definition
8. various senses of a word, connotations
9. logical division
10. induction

11. existing decisions

12. parts of a subject, taken separately

13. good and bad consequences

14. contrary alternatives or consequences, "divarication"

15. paradox of private feelings and public behavior

16. proportional results or rational correspondence

17. identity of results to the identity of their antecedents

18. altered choices, i.e. "men do not always make the same choices on a later as on an earlier occasion."

19. conceivable motives as actual motives for an event or a state of affairs

20. incentives and deterrents as "the motives people have for doing or avoiding the actions in question"

21. incredible occurrences

22. inconsistencies of the facts--conflicting dates, acts, and statements

23. explaining special circumstances

24. the presence or absence of the cause to the existence or non-existence of the effect

25. better courses, better alternatives

26. contemplated action runs counter to previous actions

27. previous mistakes

28. meaning of names

It is the nature of these twenty-eight enthymeme topics to help a writer or speaker persuade his audience. As a heuristic for extracting subject matter from the void, these topics, on the surface, would seem less valuable. Indeed, Aristotle argues that the first thing speakers must know is "some, if not all, of the facts about a subject." "Otherwise," he continues, "we can have no materials out of which to construct arguments" (p. 140). Therefore, the legitimate power of the enthymeme topics derives from their predicable nature. The list of topics above was typical of the classical rhetorical treatises which assembled lists of topoi for students and statesmen alike to learn and employ.

Young (1976) summarizes, "Arguments in support of the thesis can be discovered systematically by the use of topics, or heuristic probes: logical arguments can be developed by definition, comparison, contrast, antecedents, consequents, contradictions and so on" (p. 9). Corbett (1971) likewise argues that the classical rhetoricians defined the topics as "really an outgrowth of the study of how the human mind thinks" (p. 108). Kinneavy (1971) counters the argument that the topics "are not fertile frameworks for exploration or persuasion in modern times" by stressing the validity of the basic notion of the topics, i.e. "an attempt to formulate the kinds of arguments which seem plausible to a given audience" (pp. 247-248). Another important consideration is that Aristotle's topoi are not meant to be an exhaustive listing, but as Richard C. Huseman (1965) writes, "as an indication of the more important argumentative forms that an orator will need to use" (p. 249). He continues:

> The general topics, then, are either implicitly or explicitly stated enthymemes. Take, for example, Aristotle's first argumentative form, based on a consideration of opposites. His example of this argumentative form, "temperance is beneficial; for licentiousness is hurtful," is stated in enthymematic form and can be thrown into valid syllogistic form containing two premises and a conclusion. These general

> topics, then, are guides to the form of argument. It is in presenting these general topics, which can be used in all types of oratory, that Aristotle makes his contribution to the concept of topoi held by his predecessors, i.e. that topoi can only be used for certain speeches. (pp. 249-250)

Consequently, Aristotle's enthymeme topics are at once non-data conditioned and the rhetorical equivalent of the logical syllogism. Corbett, again, points out that a modern view defines the enthymeme as an abbreviated syllogism. This modern view, Corbett holds, is probably implicit in Aristotle's statement from the Rhetoric (I,2), but it is not Aristotle's complete description of the enthymeme by any means. As Aristotle illustrates in the Prior Analytics (II,27), the essential difference is that the syllogism leads to a necessary conclusion from universally true premises, but the enthymeme leads to a tentative conclusion from probable premises (Corbett, p. 73). In the development of Aristotle's thinking, as Kinneavy (1979) notes, a decline of certitude and a deemphasis on alethe (meaning roughly "absolute knowledge or truth") corresponds to a rise of probability and an increasing emphasis on pistis (meaning "probable knowledge or belief"). Such a development hardly surprises our culture, since it merely verifies our age's scientific and philosophical

dissatisfaction with "universally true premises." For out of the ashes of absolute truth and logical positivism, the rhetorical enthymeme rises. The topics, therefore, encourage a writer to base arguments "upon probabilities as well as certainties" (1396a4).

The recent research in Aristotelian rhetorical theory has been conducted in the area of speech, not English composition. In particular, two studies have incorporated Aristotle's notions about the topics. One of these studies is theoretical, the other empirical.

Rodney B. Douglass's "A Modern Aristotelian Rhetorical Theory" (1976) constructs a modern social-psychological rhetorical theory which is "consistent with an Aristotelian orientation to rhetorical communicative phenomena" (p. 2494-a). What Douglass explains are the ways in which Aristotle's tactics for invention are consistent with ongoing psychological activities, are structured stimulus situations for psychological pattern-making, and are means for anticipating rhetorical events. While Douglass's sweep is broad, his work verifies the renewed psychological interest Lauer and others have taken in the composition process.

Aubrey Neil Yerkey's "The Retrieval of Rhetorical Topoi: A Computer-Assisted System for the Invention of Lines of Argument and Associated Data" (1976) is the only research found which combined invention and instructional computing. These computer programs were designed to help a speaker find potential arguments by presenting the speaker with information about how certain audiences felt about twenty-one selected issues. The resulting analysis led to the development of an algorithm which was developed into two computer programs. Yerkey writes, "This algorithm became the heart of two computer programs: one organizes and displays information about any number of issues and creates a permanent data bank; the second accepts measures of audience attitude toward one issue, retrieves the appropriate information from the data bank, displays the predisposition, and suggests appeals" (p. 2501-a). Yerkey's two experiments--comparisons of computer-cued speakers with other speakers--found that "the cued speakers effected significantly greater attitude change than uncued speakers, but not quite significant differences in quality of arguments and overall efficiency" (p. 2502-a). This research, however, uses the computer as a data-base for invention on only a selected number of subjects. Basically, the

programs are closed problem-solving systems in which the computer has some knowledge about audience's attitudes toward important issues. If a speaker wished to persuade an audience about another issue, the programs would be little help. Nevertheless, Yerkey's study illustrates that it is indeed possible to create a computer-assisted invention sequence which will help speakers discover persuasive arguments about selected issues.

Burke's Dramatistic Pentad. The questions based upon Kenneth Burke's dramatistic pentad are derived from A Grammar of Motives (1969). The five key terms of dramatism--Act, Scene, Agent, Agency, and Purpose--represent the specific perspectives all men share in the "attributing of motives" (p. xv). Specifically, Burke contends that "any complete statement about motives will offer some kind of answers to these five questions: what was done (act), when or where it was done (scene), who did it (agent), how he did it (agency), and why (purpose)" (p. xv). Many people associate the dramatistic pentad with the journalistic pentad, i.e. who, what, when, where, and why, but somehow the journalistic pentad oversimplifies in its closure the potential complexity of an inquiry

using the correlations, associations, and combinations a consideration of these terms can offer. To illustrate this phenomenon, Burke writes about an exhibit of photographic murals he once visited at the Museum of Modern Art; he recounts seeing "an aerial photograph of two launches, proceeding side by side on a tranquil sea:"

> Their wakes crossed and recrossed each other in almost an infinity of lines. Yet despite the intricateness of this tracery, the picture gave an impression of great simplicity, because one could quickly perceive the generating principle of its design. Such, ideally, is the case with our pentad of terms, used as a generating principle. It should provide us with a kind of simplicity that can be developed into considerable complexity, and yet can be discovered beneath its elaborations. (p. xvi)

Thus, what ultimately recommends the dramatistic pentad is the manner in which the ten possible ratios can be manipulated in order to explore unknowns. For example, perhaps one can describe the scene and define the act, but a scene-act ratio enables one to explore a relationship between where something happened and what happened. Such ratios offer the writer exploratory probes he or she may not have considered before.

Kenneth Burke opens a recent essay entitled "Questions and Answers about the Pentad" (1978) by writing "Maybe my concern with matters of literary theory might be of some suggestive value to persons concerned with the teaching of literary composition. But what should I say?" (p. 330) Implicit in such a statement is the notion that pentadic invention, while often used as a means of inquiry in composition courses, is actually a literary theory which became the "germ" (p. 330) of the overall philosophic position Kenneth Burke articulated. As Burke envisions the dramatistic pentad as a more dialectical than rhetorical instrument, he traces its exploratory appeal not to Aristotle's system of topics but to Aristotle's classification of causes. Specifically, he traces the pentad's evolution through both Aristotle and Aquinas:

> The most convenient place I know for directly observing the essentially dramatist nature of both Aristotle and Aquinas is in Aquinas' comments on Aristotle's four causes (in pp. 154-163 of the Everyman's Library edition). In the opening citation from Aristotle, you will observe that the "material" cause, "that from which (as immanent material) a thing comes into being, e.g. the bronze of the statue and the silver of the dish," would correspond fairly closely to our term, scene. Corresponding to agent we have "efficient" cause: "the initial origin of change or rest; e.g., the adviser is the cause of the action, and the father a cause of the child, and in general the agent the cause of the deed." "Final" cause, "the end, i.e. that for the sake of which a thing is," is

> obviously our purpose. "Formal" cause ("the form or pattern, i.e. the formula of essence") is the equivalent of our term act. . . . We can approximate the equation closely enough if we think of a thing not simply as existing, but rather as "taking form," or as the record of an act which gave it form. . . .
>
> There is also a negative way of establishing the correspondence between form and act. Recall the scholastic hexameter listing the questions to be answered in the treatment of a topic: Who, what, where, by what means, why, how, when: quis, quid, ubi, quibus auxiliis, cur, quo modo, quando. The "who" is obviously covered by agent. Scene covers the "where" and "when." The "why" is purpose. "How" and "by what means" fall under agency. All that is left to take care of is act in our terms and "what" in the scholastic formula. Also, the form of a thing was called "whatness," or quidditas. (p. 228)

Burke's rhetoric, therefore, differs from classical rhetoric in that his major concern is not persuasion but rather "identification" (Burke, 1951; Corbett, 1971; Kinneavy, 1971; Young, 1976).

Finally, since some popular composition textbooks cite the pentad as an important invention heuristic (Irmscher, 1972; Winterowd, 1975), Burke (1978) offers a few precautions in its use in the composition setting; he notes:

> But Irmscher [1972] makes one mistake in comparing the pentad with Aristotle's topics. In the Rhetoric, for instance, Aristotle's list is telling the writer what to say, but the pentad in effect is telling the writer what to ask. Whereas the terms may look positive, they

> are but blanks to be filled out. . . .
>
> Maybe I can now make clear my particular relation to the dramatistic pentad, involving a process not quite the same as either Aristotle's or Irmscher's. My job was not to help a writer decide what he might say to produce a text. It was to help a critic perceive what was going on in a text that was already written. Irmscher uses the "dramatistic" terms as suggestions for "generating a topic." My somewhat similar expression, "generative principle," is applied quite differently. My job was to ask of the work the explicit questions to which its structure had already implicitly supplied the answers. The kind of thinking which I associate with the pentad and which needs further development should guide the framing of these questions. . . . (p. 332)

Burke's distinction, here, between what to say and what to ask is a fine one. Although such a distinction exists in invention strategies, in the programs developed for this research--all concerned with the framing of invention questions--the burden of asking fell into the computer's domain and the heavier burden of saying fell into the writer's domain.

Still, the majority of the scholarship on the pentad does not explore the "framing of the questions" but rather explicates Burke's theoretical concepts; (see Young (1976), pp. 13-16). To date, no empirical research has attempted to validate the quantitative and qualitative aspects of the dramatistic pentad in the composition setting.

Tagmemic Invention. The science of human behavior and, specifically, the science of verbal behavior form the context for tagmemic invention. Since Kenneth Pike's Language in Relation to a Unified Theory of the Structure of Human Behavior (1967), Viola G. Waterhouse (1974), as well as a number of other linguists, argue that language study and research have had to (1) view language as a type of human behavior, and (2) examine language "in the context of and in relation to human behavior as a whole" (p. 5). Pike looks to Ward H. Goodenough (1957) to explain the general problem:

> The general problem can be summed up in the words of Goodenough, who affirms that "The great problem for a science of man is how to get from the objective world of materiality, with its infinite variability [an etic view of the world], to a subjective world of form as it exists in . . . the minds of our fellow men" [through the discovery of their emic units]. (p. 55)

Since this problematic transition from etic to emic units also occurs as a writer begins the composing process, Richard Young, Alton Becker, and Kenneth Pike began developing the tagmemic matrix as a rhetorical heuristic. The result is explained in their text Rhetoric: Discovery and Change (1970).

The heuristic procedure itself combines four maxims for understanding a writer's position in relationship to the world, an audience, and a language system. These maxims are:

1. "People conceive of the world in terms of repeatable units" (p. 26).

2. "Units of experience are hierarchically structured systems" (p. 29).

3. "A unit, at any level of focus, can be adequately understood only if three aspects of the unit are known: (1) its contrastive features, (2) its range of variation, and (3) its distribution in larger contexts" (p. 56).

4. "A unit of experience can be viewed as a particle, or as a wave, or as a field. That is, the writer can choose to view any element of his experience as if it were static, or as if it were dynamic, or as if it were a network of relationships or part of a larger network" (p. 122). Incidently, in this current study, the CAI questions were derived from these perspectives of particle, wave, and field.

The result of combining these maxims is a nine-celled matrix: the rows representing the perspectives of particle, wave, and field; the columns representing the unit's "contrastive features, variant forms, and distributions in larger contexts" (p. 126). Using the matrix, then, is a matter of developing some facility in shifting cells; Young, Becker, and Pike write:

> By following the instructions in each cell, you are led to shift perspectives systematically, focusing your attention first on one feature of the unit and then another. In doing so you fulfill the basic requirement of effective inquiry, which is to vary your assumptions. The purpose of the procedure is not to turn you into an intellectual machine that gathers information mechanically, but to guide and stimulate your intelligence, particularly your intuition, which is able to deal with enormous complexity in an original way. (p. 128)

Essentially, tagmemic invention emphasizes "psychological changes in the writer" and focuses on the "retrieval of relevant information already known, analysis of problematic data, and discovery of ordering principles" (Young, 1976, p. 23). Again, Waterhouse, in The History and Development of Tagmemics, has reported that the bibliography concerning tagmemics and English is continuing to grow, particularly in the teaching of composition and in the teaching of English as a second

language (p. 73). Among those who have incorporated aspects of tagmemics in their composition courses are Hubert English (1964), Janice Lauer (1967), and Lee Odell (1970). Increasingly, more and more classroom invention strategies rely on the power which is generated by this heuristic--an illustration being Gracia Grindal's and Ellen Quandahl's (1977) adaptation of Becker's pattern of topic-restriction-illustration or "T-R-I" methodology.

Of the three heuristic procedures in this study, the tagmemic matrix is the only one which has been evaluated in a composition curriculum to determine if "instruction in tagmemic invention does in fact bring about significant changes in the student's conceptual ability and ability to communicate" (Young, 1976, p. 24).

An important study in the teaching of tagmemic invention was Richard Young and Frank M. Koen's The Tagmemic Discovery Procedure: An Evaluation of Its Uses in the Teaching of Rhetoric (1973). This NEH-funded study attempted to determine "whether instruction in the tagmemic discovery procedure . . . significantly improves the student's ability to inquire into ill-defined problems and to communicate the results clearly and persuasively" (p. v). Their experimental

predictions were essentially calibrated to measure the growth in subjects' ability to identify, analyze, state, and explore problematic situations. The statistically significant improvements were achieved in the subjects' abilities to analyze and articulate problematic situations in terms of the tagmemic inquiry procedures. While the ability to identify problematic situations was not statistically significant and while the ability to explore problematic data efficiently was difficult to determine since the experimenters "were not able to determine whether this important result was directly related to the use of the nine-cell procedure or to a general loosening of constraints on thinking" (p. 48), their experiment actually did distill subjects' protocols for thinking about problems while in the prewriting stage.

The study is also valuable for articulating some of the descriptive behaviors of the twelve students who took part in the experiment. For example, Young and Koen noted that the task's directions to "list the ideas that come to mind" (p. 52) make it difficult to evaluate the protocol of the subject's thinking. This notion, of course, brings up the central issue of how best to test for heuristic internalization, especially when attempting to isolate specific cells of the nine

tagmemic perspectives. Another behavior which Young and Koen observed was that subjects tended to improve the number of their observations; they write:

> This increase in the number of observations seems a worthy goal in itself. Its achievement could be taken to mean that the student has become aware of more items of information he possessed that were relevant to the problematic situation. It is unlikely that his general fund of knowledge had been significantly increased, but perhaps more of it has been raised to a conscious level. . . . We might point out . . . that one function of the heuristic procedure is to aid in retrieving relevant information. (p. 54)

Another important observation was that their subjects "found it difficult to withhold judgment during their inquires" (p. 56):

> They had a strong tendency to adopt a conclusion quite early and then seek supporting evidence. . . . They appear to have lacked what John Keats called "negative capability"--the ability to be "in uncertainties, mysteries, doubts, without any irritable reaching after fact and reason." Keats believed that this ability to tolerate ambiguity is exceptional, and so it seems. Further work would be needed to induce students to examine their ideas more critically and to withhold judgment while inquiring. (p. 57)

The problem, which this tendency to prematurely evaluate ideas illustrates, is probably more cultural than rhetorical; nevertheless, it is difficult for many subjects to truly withhold judgment and allow their creative energies to reach for new approaches and answers.

Another significant research study in the teaching of tagmemic invention was conducted by Lee Odell. Odell in "Measuring the Effect of Instruction in Pre-Writing" (1974) summarizes the findings of his dissertation, Discovery Procedures for Contemporary Rhetoric: A Study of the Usefulness of the Tagmemic Heuristic Model in Teaching Composition (1970). Odell's research questions were: (1) Is it in fact possible to give students help in the prewriting stages of composition? (2) Can they be taught a set of operations which will actually have some demonstrable effect on their writing? And (3) how would one go about identifying those operations in student essays? By examining essays written in two freshman composition classes at the University of Michigan, Odell sought "to provide at least partial answers to these questions" (p. 229).

His research rationale was to "(1) predict the changes that should take place in student's work; (2) determine the number of students whose writing showed these changes; (3) determine how likely it was that these changes could be attributed to chance" (p. 230). Odell summarizes his results:

> Prediction I stated that students would examine data more thoroughly. In their posttest essays, they would (1) perform a greater number of the intellectual operations taken from Pike's theory; (2) perform each operation more times than in their pretest essays. The first part of this prediction received little support: only three posttest essays out of twenty showed students performing a greater number of the intellectual operations; sixteen showed no change. Results . . . for the latter part of Prediction I more clearly supported the hypothesis. In each of the posttests, there was as increase in the number of times the students performed at least some of the operations suggested by the heuristic model. For four of the operations, the proportion of essays in which the predicted increase occurred was statistically significant. For one operation, the proportion of essays showing this increase was more modest and could be attributed to chance.
>
> Prediction II stated that the posttest essays would contain fewer conceptual gaps than did the pretest essays. This prediction was not confirmed. Only fifty percent of the posttests showed the predicted change, while eight showed an increase in conceptual gaps.
>
> Prediction III stated that in their posttest essays students would solve problems more adequately than they did in the pretest essays; they would: (1) present more evidence; (2) make fewer statements that might seem questionable to a reader; (3) increase the number of statements in which they acknowledge

> that alternative hypotheses are possible or try to justify not including evidence that might seem to weaken their argument. . . . The first part of the prediction was borne out by significant increases in students' use of evidence in posttest essays. Parts 2 and 3 of the prediction were not confirmed. (pp. 235-236)

Odell's research confirmed the need to sort out systematically what can and what cannot be taught successfully in the prewriting stage of the composition process. However, any conclusions based on his findings must be considered tentative for the following reasons. First, his sample was small. Second, he taught both of the composition courses himself. Third, evaluating prewriting results from evidence in completed essays allows a multitude of uncontrolled variables. Odell's preexperimental design, specifically a one-group, pretest-posttest design, is perhaps the major flaw, though he explains why he had to settle for such a design:

> Conventionally, the effectiveness of this experimental course would be determined by measuring the progress of two groups of students--one which had received instruction in the use of prewriting procedures and one which had not--toward a common goal. In this case such a comparative study was not practicable. No other section of Freshman English was sufficiently similar in aims or content to allow meaningful comparison. (p. 230)

While Odell's design is consequently short on internal validity (mainly maturation and test effects), his research is vital, for the tagmemic heuristic had never been so systematically evaluated for its effectiveness in the freshman English classroom. Moreover, Odell's research provides support for the belief that the teaching of prewriting procedures positively affects student writing.

## Research Questions

On the basis of these developmental considerations, the three heuristics, and a four-group, pretest-posttest research design (described fully in the next chapter), the following research questions were posed:

1. How will freshman English composition students react to computer-assisted invention?

2. Will freshman English composition students sustain "invention dialogues" with a computer program, even though they recognize that the computer knows nothing about the content of their research subject.

3. Will there be different reactions, sustaining rates, and extending inquiry percentages among the experimental groups because of the different heuristics?

4. Will these CAI units stimulate composition students to generate more ideas about their respective topics than they could generate on their own in the same time?

5. Will the CAI units stimulate composition students to discover more quality ideas about their respective subjects than they could discover on their own in the same time?

6. Will the composition students in the experimental heuristic treatment groups internalize the heuristic well enough to generate their own questions?

7. Will there be differential quantitative effects among specific heuristic treatments?

8. Will there be differential qualitative effects among the specific heuristic treatments?

9. Without specific instruction in arrangement, will CAI-prompted students be able to provide a more insightful, more comprehensive, more mature, more suitable, and more helpful composition plan than those subjects in the control group?

10. What correlations will there be between the quantitative and qualitative performances and such variables as SAT verbal score, SAT quantitative score, ECT placement score, and first semester grade in English composition?

Hypotheses

Finally, these research questions prompted the formulation of these corresponding research hypotheses:

1. As described by an anonymous Likert questionnaire, the experimental subjects will share an overall positive attitude toward the CAI units. This descriptive hypothesis will be supported if the overall item score's mean exceeds 3.5 on the five-point Likert scale.

2. Over ninety-five percent of the experimental subjects will sustain an invention dialogue for the full duration of the thirty-minute posttest, and there will be no difference among the three groups.

3. Subjects will answer seventy-five percent of the non-data conditioned questions presented in the thirty-minute posttest and extend the inquiry (i.e., answer the question and elaborate on their response at least once) sixty percent of the time. Additionally, there will be no difference among in the rates among the experimental and control groups.

4. There is no difference in individual's quantitative performance on a pretest and a posttest as measured by a surface-cued, proposition analysis. This hypothesis is to be tested at the .05 level of significance.

5. There is no difference in individual's qualitative performance on a pretest and a posttest as measured by a panel of composition teachers using a scale emphasizing evidence of insightfulness, comprehensiveness, and linguistic cues of intellectual processing. A t-test for correlated samples will be used to test this hypothesis at the .05 level of significance.

6. Three weeks after the lectures and the on-line treatment, the experimental subjects will be able to generate ten questions about a selected subject from their respective heuristic strategies. Moreover, there will be no difference in the internalization performances among these three experimental groups as evaluated by a panel of experienced composition teachers.

7. There is no difference in the quantitative performance on a pretest and a posttest among the four groups. Additionally, there is no difference in the quantitative performances among the three experimental treatment groups. The level of significance will be .05.

8. There is no difference in the qualitative performance on a pretest and a posttest among the four groups. Furthermore, there is no difference in the qualitative performances among the three CAI-prompted groups. Again, the significance level will be .05.

9. There is no difference in the qualitative performance (criteria being insightfulness, comprehensiveness, maturity, suitability of arrangement, helpfulness, and holistic impression) among the composition plans of the four groups as evaluated by experienced composition instructors. Using analysis of

covariance, this hypothesis will also be tested at the .05 significance level.

10. There is no correlation between quantitative and qualitative performances and SAT verbal score, ECT placement score, and the previous semester's grade in composition. A Pearson correlation coefficient will describe the strength of the various relationships.

# CHAPTER 2

## Tasks, Procedures, and Measures

### The Tasks

The first developmental task was to design a [illegible] instructional prewriting questions which [illegible] routine to simulate three particular, [illegible]ed perspectives for examining a [illegible]s, however, had to be (at worst) [illegible] interesting, appropriate, and [illegible] by theory. Koestler, [illegible] first sector and [illegible]. The [illegible]

writer discover what he or she did not know about the subject, thus generating some felt difficulty, some dissonance, and prompting the student to articulate the particular problematic situation which the computer-cued interaction uncovered.

In late 1977, research began. First, dialogue models of question-answering systems were designed. Second, specific question pools were written based on the topics, the pentad, and the tagmemic matrix.

Developing the algorithm of an invention dialogue model raised a number of machine considerations. Among the major considerations were these five:

1. What type of program could be developed which allowed a computer-naive user to "invent" successfully? In other words, what kind of interactive design would enable an inexperienced computer user to sustain a question-answering dialogue about any subject?

2. Could this "invention" module be programmed well enough to elicit additional comments in an exploration of any subject?

3. Lacking content data-bases, would students lose interest? In other words, what motivational cues would adequately compensate for an inevitable lack of knowledge about their subjects?

4. What continuity could be achieved besides that inherent in the three heuristic methods?

5. Could such programs be developed in a cost-effective manner?

These questions followed from the general difficulties computer technicians were experiencing in attempting to design programs which "comprehended" and imitated natural language processing. For example, the research in artificial intelligence had carefully delineated the major deficiencies of man-machine communication. William C. Mann (1977) summarized the essential dilemma:

> Conventional man-machine communication can give the computer user a sense of always operating "out of context," of having to continually re-specify what is relevant to performing a desired sequence of actions. In human communication it is the goal structures which carry the knowledge of what is relevant. Man-machine communication gives a sense of aimlessness, undirectedness, and lack of topic because there is no analogous body of knowledge being used to facilitate and interpret the communication. (p. 11)

Consequently, the developmental obstacle was how to shift the entire burden of content to the user and still make the inquiry representative of how the human mind actually works when inventing. The solution emerged by understanding that (1) heuristic inquiry was an explicit goal structure, (2) a sufficient number of specific semantic strings could be anticipated, (3) a series of syntactic prompters and non-data conditioned motivational strategies could also encourage the inquiry, and (4) a well-written, thought-provoking set of questions, as well as a reoccurring sense of purpose, could give the CAI modules a sense of direction. Again, though, the responsibility for content would be the user's. The state of the art, unfortunately, would allow no more than a minimal interpretation of the writer's declarative statements. The CAI unit's feedback would rely on word length cues, answer length cues, clarification request strings (e.g., "what?", "I don't understand. . . ."), and a brief list of direct commands (e.g., "explain!" "continue!" "repeat!" "wave!"). Thus, all responses which were not "understood" in the semantic subroutines would prompt the program to encourage the exploration, tally the response, and, depending on the number of responses to a particular question, either ask for more elaboration or

direct the writer's attention to the next question. Finally, no on-line mechanism could compensate or evaluate poor declarative responses; that adage about CAI--"garbage in, garbage out"--would necessarily apply.

Pilot Research. The second developmental task was to validate the three heuristic question pools; therefore, an off-line pilot study was undertaken. Three main questions were asked:

1. Will freshman composition students answer questions about their individual subjects, even though all the questions are non-data conditioned, and even though they will have had no formal instruction about specific heuristic strategies?

2. Will such question pools provide composition students with more ideas about their respective subjects than they could discover on their own?

3. Will there be differential effects among the three specific heuristic treatments as represented by these question pools?

Twelve students in a freshman English course in a second summer session at the University of Texas at Austin volunteered to participate in a "prewriting session with an English composition tutor." Eleven students completed the experiment; one subject withdrew for personal reasons. The students were randomly

assigned to one of the three experimental treatments, corresponding to either the Aristotelian topics, the dramatistic pentad, or the tagmemic matrix. Since their composition instructor required a research paper, the students were told that the tutor would help them explore their topic in a special prewriting conference.

The pilot design followed a three-group pretest-posttest design. The pretest was administered in a fifteen-minute session during one of the students' regular class meetings. The instructions were that the student list and number ideas about the subject of his or her research paper; the students were encouraged to write down all of their ideas since they would be helpful to the tutor later. Each subject's proposition count was doubled and reported as the pretest score. The treatment and the posttest were administered simultaneously--the treatment being questions from one of the heuristic methods and the posttest being the student's list of answers or ideas. Time for this session was thirty minutes. Again, no effort was made to teach the students a particular heuristic; they only realized that they were being asked to respond to a series of questions.

At the beginning of this session, each student was read these scripted instructions:

> This afternoon . . . I am going to ask you a number of questions about your topic [mention their topic]. The questions are meant to be probing, but some may sound funny and not make much sense. However, if something, some idea, occurs to you, write it down, or, if you prefer, you can answer orally and write the idea down after you "talk it out"--whatever way is the most comfortable for you. Any questions so far?
>
> Finally, you might think of me as a computer terminal for the next thirty minutes. As a matter of fact, I'll pretend I am a machine. Not a strange voice or anything like that, but you will have to tell me when you are ready to go on to the next question. Shall we try a couple of questions so you can get the idea. . . .

After a model question or two, the treatment began. During the treatment/posttest, a tally of the questions asked and the questions answered was kept. In order to check the tally, a cassette tape was also made of the treatment. Verbal positive reinforcement was given for every other idea. At the conclusion of the thirty minute session, the subject and the researcher discussed the experience informally. Did the session seem valuable? What did the student think of the experience in general? What was the worst question? What was the best question? This discussion was also taped. At the end of the session, the students were asked not to

discuss the treatment with other class members also participating in the study.

The Findings of the Pilot Study. The findings of this pilot study validated the heuristic question pools, for the students answered 228 of the 252 questions proffered--slightly over ninety percent and well above the predicted seventy-five percent. Five of the subjects answered every question, and only one subject failed to answer seventy-five percent of the questions. Furthermore, there was a significant difference in the quantity of ideas between the pretest and the posttest; in fact, a probability of .001 was achieved using a t-test for correlated samples. Finally, the null hypothesis that there would be no significant difference between the treatments with respect to the quantity of ideas was accepted. Thus, the specific heuristic method appeared not to matter with respect to the quantitative performance among these three small groups (F=.0093).

Programming Considerations. From these validated question pools and from the responses the students made for clarification, the next phase was to program these modules for the on-line experiment. Under the technical direction of Dr. George H. Culp, I developed three CAI units in the BASIC language for the

DEC-10 (Digital Equipment Corporation-10) computer at the University of Texas at Austin. Appendix A illustrates the general instructional design for all of the CAI units. Appendix B gives the listings for the respective programs. Appendix C contains three of the actual "runs" from the final experiment. Briefly, however, in the instructional sequence, the student would be welcomed to the computer terminal, offered the opportunity to review the directions and the specific heuristic, asked to enter a subject to explore, asked to comment on the purpose of writing about this subject, asked five of the easier heuristic questions (complete explanations and examples would be available here), and randomly prompted to add more information. This cycle would then be enlarged after the sixth question so that the entire heuristic set could be asked. At the same time, the student would be asked to comment more about purpose as well as given opportunities to narrow or change the subject. At the conclusion of the CAI inquiry, the student would tell the program to "stop!"

Unlike traditional programmed instruction and computer-assisted instruction of the drill and practice variety in which the answers are "known" (i.e. stored in the program's memory), these programs were designed to give one appropriate, though non-data conditioned, response. The programs could not verify a "right" response nor challenge a "wrong" response. Moreover, unlike laboratory instruction and computer simulation instruction in which the students' responses necessarily determine the next step, these invention modules generally relied more on counting the number of responses and the availability of other heuristic questions than on specific, declarative responses. Questions and certain commands helped the student control the direction of the inquiry, but exclusive control generally was not exercised by students. In the pentad and tagmemic programs, however, students had a little more flexibility in that they could command the system to ask questions from a specific perspective of the heuristic, i.e "act!" or "scene!"/"wave!" or "field!" Overall, therefore, the interaction was designed to allow for active student involvement, machine heuristic manipulation, and cathode ray tube (CRT) compatibility.

The most challenging part of the programming was anticipating the ways in which the writers would indirectly ask for clarification. A keyword subroutine was finally selected (see "semantic stabs" in Appendix B) which anticipated up to twenty-seven strings, reading them linearly. These strings, combined with the randomness of the question selection and the pools of individualized responses, gave the programs a richness which exceeded the expectations of the prototype. The Aristotle program allowed 3,216,320 branching possibilities from the welcoming sequence through the full exploration of the first question. The Burke and the tagmemic modules allowed more possibilities since a writer could select specific heuristic perspectives--6,272,000 and 5,408,000 respectively. Furthermore, as an example, engaging in a dramatistic inquiry through five questions meant that geometrically over 200 million possible "avenues" are possible.

As each module was completed, a number of trial runs were necessary in order to debug and edit the programs. The first program was completed in three months at a cost (for computer time only) of $250.00. The next two programs were completed within two weeks at a cost of approximately $75.00 for the computer time. Obviously, most of the complexities were overcome in the

programming of the first module. These developmental tasks complete, the three CAI-prompted invention modules were ready to be evaluated in a larger experiment.

## The Experimental Procedures

Subjects. Students in four second semester English composition classes at the University of Texas at Austin volunteered to participate. The specific course, English 308, emphasized "reading persuasive and argumentative essays, and writing with the use of the aims and modes of discourse." No literature was taught; rhetorical principles were stressed. Basically, those students who elected to take this course were interested in improving their expository composition skills. All subjects selected this course over the other two options--a literature-based writing course and a pop culture-based writing course. A total of seventy-two subjects volunteered to participate and took the pretest, and a total of sixty-nine subjects completed the treatment and the posttest. The mean SAT verbal score for these sixty-nine students was 443.48. Their ECT mean score was 393.91. Their mean first-semester English G.P.A. was 2.46 on a four-point scale, and their mean high school percentile was 72.23. Sixty-seven subjects completed the follow-up composition

plan within the required time limit. Only the experimental groups wrote the internalization exercise and completed the attitude questionnaire; forty-eight subjects completed these instruments, five subjects being absent. The attrition though the composition plan was due to three subjects being unable to schedule the on-line practice session, the on-line posttest, and the writing of the composition plan within the two-week experimental phase.

Treatment. While the seventy-two subjects were assigned to four distinct English 308 sections, the treatments were randomly assigned to the classes. The slightly unequal number among the treatments resulted from the differences in class size as well as the number of subjects who voluntarily gave their consent. All subjects, including those in the control group, were aware that they were involved in an experiment involving computer-assisted instruction in invention. Those members in the control group were given the opportunity to use the computer programs after the pretest, the posttest, and the composition plan had been completed; three actually did so. To control for teacher variability, I presented to each of the four groups two, one-hour lectures about their heuristic strategy. The control group's lectures concerned the problem-solving

or creative process, i.e. "preparation, incubation, illumination, and verification." The control group's discussion remained general and experiential, whereas the experimental groups, by the end of the second lecture, were asking specific heuristic questions. The instructional materials used in these lectures consisted of class handouts on each of the heuristic sets (see Appendix D). These handouts showed some of the non-task conditioned questions the students would answer when they logged in at the computer terminal.

During the week of the lectures, the experimental subjects were scheduled for a [illegible] practice session. These thirty-minute practice sessions were conducted in order to familiarize the subjects with the operation of the Lear Siegler ADM-3 display terminal, a CRT. Specifically, they were taught the keyboard characteristics, the cursor control keys and special keys (e.g., RETURN, SHIFT, RUB OUT). The practice sessions also familiarized them with the invention program's [illegible] commands and the [illegible] conclusion of the [illegible] given an [illegible] program [illegible]

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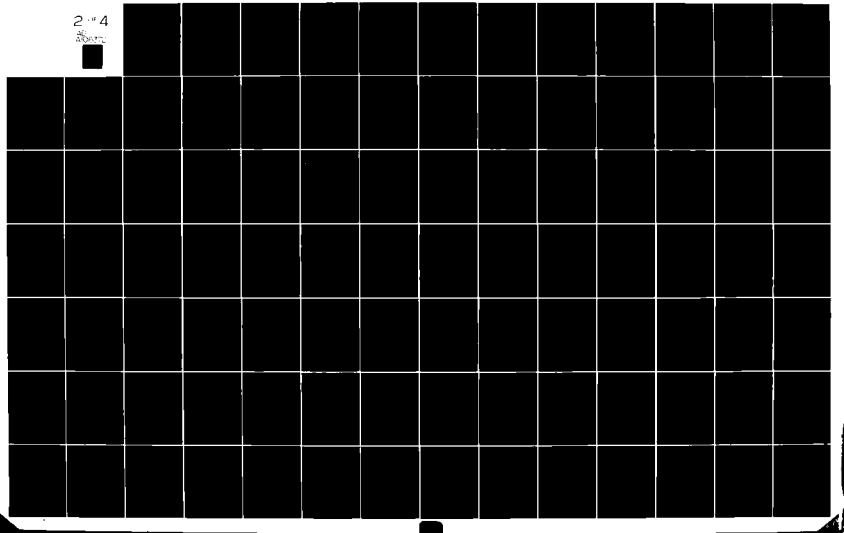


The posttest administration began the following week. The motto for the posttest was "If you think it, type it!" The control group was told "If you think it, write it down." All the subjects in the experimental sections were logged on to the system by a member of the research team. After the first question appeared, they were timed for thirty minutes. The only encouragement came from the program itself. Two subjects had to be rescheduled for the posttest because the computer "crashed" after they had been logged in. The posttest for the control group was administered in class. Their instructions were to list any and all ideas they had about the topic of their research paper. They also had thirty minutes, and again there was no additional encouragement if they stopped writing before the thirty minute time limit expired.

After the posttest, all students were then assigned a composition plan (see Appendix E). As the assignment explained:

> A composition plan is a brief, though suggestive, blueprint of your paper. Some plans may be as formal as an outline (complete with Roman numerals) or a paragraph by paragraph synopsis. Other plans are more informal: a list of main ideas arranged in some order of diminishing importance or graphic scattergrams (i.e., encircled ideas connected to each other.) Your assignment is to take your last list of

> ideas and develop a plan for your research paper. Your plan is due two days from today.

The control group received this assignment immediately after the posttest. The experimental subjects received this assignment the day after their CAI treatment; they also received a printout of their thirty-minute session at the same time. Also, all students were told to spend no more than two hours completing this last assignment. The due date was later modified from two days to "within a week" for all students. As several students explained to the researchers, they needed more than forty-eight hours to think about their ideas. Another, perhaps more likely, reason for this schedule modification was that this particular assignment did not count toward their English course grade. Nevertheless, the one-week deadline seemed sufficient, though two students were unable to meet this amended deadline. Although some of the students asked for additional help with the writing of this plan, they were told "due to the experimental constraints" no help was available until the composition plan had been turned in.

Internalization. Testing for internalization of the heuristic was incorporated into the design in early 1979. While the short duration of the proposed experiment might have been, and may still be, a legitimate argument not to test for internalization, many humanists would remain unconvinced unless some attempt to grapple with the issue of internalization was made. In other words, the research may have been found valid but not particularly persuasive, especially to a humanistic audience. In his response to the pilot study, Richard M. Coe (1978) stressed the importance of an internalization hypothesis:

> If composition is a humanistic discipline--or if writing is a craft, not just a skill reducible to a set of sub-skills--we must give writing students some understanding, not just immediate technical facility. Assuming your computer questions work (as I assume they will), I, as a humanistic composition teacher, need to know if they will give students some understanding of heuristic processes and if they are internalized, if there is carryover: do students eventually get to the point where they can use the Pentad without the mediation of your question-pool? do students eventually get to the point where they can invent when they do not have a computer handy? In other words, assuming that these computer programs do indeed improve the quality of certain writings, I want to know if they also help students to become more effective writers in the long run.

Largely because of such urging, three weeks after the experiment, the subjects in the experimental sections were asked to write ten questions from their "heuristic's" perspective about one of four subjects: inflation, jogging, music in Austin, or college academics. They had ten minutes to complete this exercise. Since the subjects in the control group were not taught a specific heuristic strategy, they did not participate in this test.

Attitude. After the internalization exercise, the experimental subjects were asked to complete an attitude questionnaire (see Appendix F). Twenty-five Likert items, four short answers, and a comment section were intended to gather the subjects' opinions about (1) the effectiveness or non-effectiveness of the CAI units, (2) the necessity of teaching invention, (3) the worth of a specific heuristic, and (4) suggestions for improving such prewriting instruction.

## Measures

Validating the measures of quantitative and qualitative growth of ideas eventually became a crucial, nearly primary, focus of this research. The quantitative measure was derived from Walter Kintsch's research with propositional representations (1974). The qualitative measures synthesized features which Kinneavy (1971) and Odell (1977) emphasize in their descriptions of invention.

Quantity of Ideas. While Walter Kintsch in The Representation of Meaning in Memory (1974) admits that his "propositional representations" may or may not be "the proper level of analysis for the study of language and thought" (p. 5), his approach formulates the problem in a most useful way:

> The problem can be formulated as "What is an idea?" or, more precisely, "How is an idea to be represented?" It is suggested here that propositions represent ideas, and that language (or imagery) expresses propositions, and hence ideas. Thinking occurs at the propositional level; language is the expression of thought. (p. 5)

Kintsch and his colleagues, therefore, are inquiring how ideas can be articulated through propositions. Those who disagree are in the unenviable position of defending ideas as "unarticulated, pre-propositional schemes of thought" (p. 5).

For this research, a reliable measure was needed to count the ideas; Kintsch's propositional system became the starting point, for he correlated surface representations with propositional analyses. Although he does not assign specific numeric values to the propositional analysis, the propositional elements are arranged in such a way that they could easily be summed and reported as a specific number of ideas. Such a scheme is illustrated in Figure 2.1 (the surface representation and the propositional analysis are Kintsch's [p. 13]; I contributed the "idea count" column). In the pilot study, these particular examples revealed some inconsistencies when six evaluators attempted to measure the quantity of ideas generated. These evaluators had difficulty using this guide; they reported that they could not consistently or easily determine a "number" from such a large variety of surface representations. There were just not enough examples; it was a burdensome tool at best. From their feedback, a transitional aid was obviously necessary,

| Surface Representation | Propositional Analysis | | Idea Count |
|---|---|---|---|
| John sleeps. | (SLEEP,JOHN) | | 2 |
| Mary bakes a cake. | (BAKE,MARY,CAKE) | | 3 |
| Freud | 0 | | 1 |
| A robin is a bird. | (BIRD,ROBIN) | | 2 |
| A bird has feathers. | (HAVE,BIRD,FEATHERS) | | 3 |
| The man is sick. | (SICK,MAN) | | 2 |
| If Mary trusts John, she is a fool. | (IF,(TRUST,MARY,JOHN), (FOOL,MARY) | | 4<br>2 |
| | | Total: | 6 |
| The old man smiled and left the room. | (OLD,MAN)&(SMILE,MAN)& (LEAVE,MAN,ROOM) | | 3<br>3 |
| | | Total: | 6 |
| Mary claimed that the old man smiled and left the room. | (CLAIM,MARY,@)& ((OLD,MAN)&(SMILE,MAN)& (LEAVE,MAN,ROOM)=@) | | 2<br>3<br>3 |
| | | Total | 8 |
| The snow melts slowly. | (MELT,SNOW)&(SLOW,MELT) | | 3 |

Figure 2.1

PILOT PROPOSITIONAL ANALYSIS GUIDELINE

and, consequently, a systems approach to counting propositions and ideas was developed (Figure 2.2). The aim of this systems flowchart essentially was to nudge the intuition toward consistency. Indeed, Kintsch's work ultimately explores the deep, elemental representations of semantic density. However, developing a reliable and practical instrument for measuring the accumulation of semantic information should, I felt, dwell close, quite close, to the explicit surface representations.

The three evaluators who measured the quantity of ideas on the 138 tests in the final experiment obtained a interrater reliability of .98355 (see Table 2.1). One evaluator wrote afterwards, "I found it [Figure 2.2] very intuitive--after we made some consistency decisions about compounding points, i.e. NP& = [NP plus] preposition, etc. I can see proposition analysis as a way of determining scores on analysis scales under the category of 'meatiness' or sentence 'texture'. . . ." As a matter of interest, the evaluators' ten "consistency" decisions which were made during the two-hour training session were:

A SYSTEMS APPROACH FOR COUNTING PROPOSITIONS/IDEAS

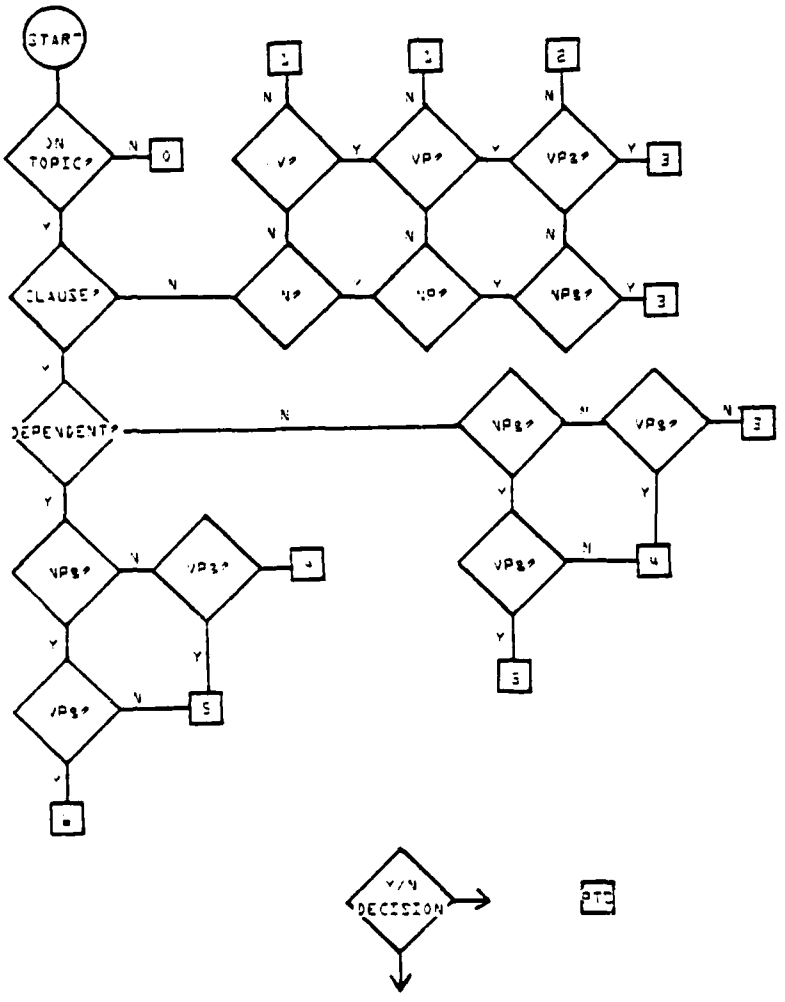



Figure 2.2

Table 2.1

MEANS, STANDARD DEVIATIONS, CORRELATIONS, AND ALPHA RELIABILITY FOR QUANTITATIVE EVALUATION

| | Means | Std. Dev. |
|---|---|---|
| I | 77.42754 | 66.17097 |
| II | 58.36957 | 45.90105 |
| III | 67.24638 | 55.82700 |

Correlation Matrix

| | I | II | III |
|---|---|---|---|
| I | 1.00000 | | |
| II | 0.98171 | 1.00000 | |
| III | 0.98393 | 0.98610 | 1.00000 |

RELIABILITY Coefficients 3 Items

Alpha = 0.98355 Standardized Item Alpha = 0.99458

# of cases = 138.0

1. prepositional phrase alone = 1

2. adjective and a single noun = 2

3. bonus for single compounding = 1

4. noun and prepositional phrase (no adjectives) = 2

5. "on topic" means "about the subject matter"

6. "rich" noun phrases ("rich" = adjectives and prepositional phrases) treat as 3 + 1 bonus

7. I think, I feel, etc. = 0 (rationale: off-topic)

8. imperatives and questions treat as independent clauses

9. why, what questions = noun phrase plus automatically

10. simple relative clauses (that and which) should be isolated but counted as independent clauses initially.

Finally, the most important guideline to the evaluators was to be as consistent as possible to their own interpretation of the systems approach. As their instructions read, "The basic aim here is to look for topic-related, dependent or independent clauses, noun phrases, verb phrases, nouns, and verbs--assigning each

unit a numeric value. The hidden agenda is an attempt to bring quantitative propositional analysis closer to the surface structure: practicality being an important part of this exercise."

Quality of Ideas. When Robert Pirsig's (1974) Phaedrus nears his major insight in Zen and the Art of Motorcycle Maintenance about the nature of quality, he writes "Quality is not a thing. It is an event." A moment later, he elaborates, "Quality is the event at which awareness of both subjects and objects is made possible" (p. 239). This particular definition of quality and the implicit definition of invention as a method of discovering or becoming aware of relationships between subjects and objects share this notion of process. Perhaps the major premise of any inquiry ought to be to discover quality. Still, measuring the growth of things is one matter, but measuring the growth of an event quite another, particularly when that event occurs in the mind.

Nevertheless, as these invention modules were intended to stimulate a growth in the sophistication of the insights, to encourage a visible change in the comprehensiveness or range of ideas, to prompt an observable, linguistically-cued interaction between a heuristic and a subject, and to increase the overall "quality" of a list of ideas about an individual topic, qualitative measures were formulated. Evaluation using these measures would attempt to estimate on a five-point continuum the subjects' performances in terms of their insightfulness, their comprehensiveness, their intellectual processing, and their overall sophistication. Later, for the composition plan's qualitative evaluation, arrangement as "structuring principle" was partialed out of the comprehensiveness category; also, intellectual processing was dropped and two categories--maturity and helpfulness--considered in its place. Since the composition plan was a single-test, dependent variable, a four-point continuum prevented the evaluators from collapsing scores toward the middle.

The qualitative rationale and first two posttest criteria--insightfulness and comprehensiveness--were primarily synthesized from Kinneavy's (1971) sections on the logic of the reference/informative aim and the persuasive aim of discourse. Factuality and surprise value were incorporated into the first measure along with those "facts" in persuasion which are "put to work to prove a specific thesis" (p. 253). While Kinneavy admits to dissolving the "ostensible simplicity of the concept of factuality" into complexity, he emphasizes verification, and he writes, "Factual verifiability is established by examining the universe, or by what is usually called empirical verification" (p. 130). Regarding surprise value, however, Kinneavy cautions, "Measurement of the sort of surprise in any kind of quantified or objective logical norms still seems quite unattainable" (p. 134). Nevertheless, surprising, original, and "inventive" information is usually strikingly visible in freshman discourse.

About "comprehensiveness," Kinneavy suggests:

> A topic about which information is desired can be considered to have a context of possible factual expectencies--the average reader interested in such a topic would presumably want certain implicit questions about a topic satisfactorily answered. These expectencies constitute the "universe of discourse" about a

> topic. When they have been adequately covered, information about the topic can be considered to be comprehensive. (p. 133)

Thus the evaluation would attempt to determine how well the subjects' lists of ideas anticipated the reader's expectations. Obviously, a heuristically-guided inquiry ought to ask writers to determine the "possible factual expectencies" which constitute the particular universe of discourse about their subjects.

Therefore, for the first two qualitative guidelines, the three evaluators made their judgments based on these definitions:

> "Evidence of Factuality, Surprise Value, Interest, Inventiveness, Insightfulness"--Evaluate the writer's discoveries. Does the writer appear to use the truth? Does the writer discover new, specific information? Does the writer demonstrate interest by using a particular slant, a point of view? Has the writer attempted some "lateral thinking," some creative responses? Is there any evidence of an "epiphany" or an "ah ha!"

> "Evidence of Scope, Comprehensiveness, Relative Completeness"--Evaluate the writer's perception of the total topic. Has the writer decided on the range of the topic? Is this range of ideas or scope appropriate for a research paper? Does the writer seem to use some structuring principle (i.e. alphabetical, numerical = low value systems; chronological, spatial = mid-value systems; classificatory, evaluative, deductive systems = high value systems).

The guideline for the evaluating the quality of the subjects' intellectual processing sought for the evaluator to attend to surface features which cued intellectual interaction. Lee Odell in "Measuring Changes in Intellectual Processes as One Dimension of Growth of Writing" (1977) makes these three assumptions about gauging intellectual change.

> 1. Although thinking is a complex activity, the number of conscious mental activities involved in thinking may not be indefinite; the relatively small number of intellectual processes identified by Kenneth Pike . . . lets us describe much of what people do consciously when they examine information, attitudes, or concepts.
>
> 2. We can identify linguistic cues--specific features of the surface structure of written or spoken language--that will help us determine what intellectual processes a writer is using.
>
> 3. In order to improve students' writing, we will have to determine what intellectual processes we want students to begin using, or use differently; to make this determination, we must have a good sense of how they are presently functioning. (p. 108)

These assumptions enable Odell to describe in some detail the intellectual significance of "occasionally ambiguous" linguistic cues. For this third qualitative guideline, the three evaluators determined a score based on the following definition:

> "Evidence of Intellectual Processes (focus, contrast, classification, change, sequence)"--Evaluate the writer's apparent mental agility by attending to linguistic cues. Focus = useful subject selections? Contrast = extensions to ideas by connectors, comparative/superlative forms, negatives, negative affixes, lexicon (i.e. difference, paradox, etc.)? Classification = syntax (NPs suggesting class), for example, for example; lexicon (i.e. similar, resemble, class, category, parts)? Change = VPs with change or synonym (realize, become aware, stopped thinking about, began noticing, etc.)? Sequence = time (i.e. when, subsequently, earlier, etc.), cause-effect (because, since).

Finally, the evaluators were also asked to report their overall impression based upon the following definition:

> "Overall Impression"--Probably an average of the above three categories, but you may also consider the writer's effort, the complexity of the topic, the timed nature of the assignment, or whatever you wish. Call it "holistic" latitude of wise, intelligent, professional evaluators.

The evaluation of the composition plans' quality added these three definitions:

> "Maturity"--Evaluate the complexity of the topic and the writer's attitude toward the topic. Objectiveness and overall tone may be useful guidelines. How thorough is the analysis?
>
> "Arrangement"--Evaluate whether or not the writer has selected an appropriate arrangement for the research paper. How true will the

> writer be to the overall structural principle in the plan? Or do you suspect there will have to be major changes?
>
> "Helpfulness"--Evaluate whether or not the writer will actually use this plan as a "springboard" for the research phase. Does the plan help the student understand what he or she must now find out?

During a two-hour training session, the three quality evaluators discussed each category, clarified some of the toughest distinctions (e.g., valued "structuring principles"), and practiced evaluating samples drawn from the earlier pilot study.

The reliability scores for the pretest-posttest evaluation are presented in Table 2.2. The greatest agreement was found in their judgments about evidence of factuality, surprise value, insightfulness (Alpha=.83072) and their overall impression (Alpha=.81481). The reliability scales for the composition plan evaluation are reported in Table 2.3. The strongest reliability score here was in the "comprehensiveness" category (Alpha=.80305); the second strongest agreement was in "arrangement" (Alpha=.79076). The least agreed upon category was "maturity" (Alpha=.68106).

Table 2.2

ALPHA RELIABILITIES FOR PRETEST/POSTTEST
QUALITATIVE EVALUATION

| | RELIABILITY Coefficients | 3 Items |
|---|---|---|
| "Factuality, Surprise Value, Insightfulness" | Alpha = 0.83072 | Standardized Item Alpha = 0.84099 |
| "Comprehensiveness" | Alpha = 0.75616 | Standardized Item Alpha = 0.76489 |
| "Intellectual Processing" | Alpha = 0.79591 | Standardized Item Alpha = 0.80076 |
| "Overall Impression" | Alpha = 0.81481 | Standardized Item Alpha = 0.82538 |

# of cases = 138.0

Table 2.3

ALPHA RELIABILITIES FOR COMPOSITION PLAN
QUALITATIVE EVALUATION

| | RELIABILITY Coefficients | 3 Items |
|---|---|---|
| "Insightfulness" | Alpha = 0.76117 | Standardized Item Alpha = 0.76238 |
| "Comprehensiveness" | Alpha = 0.80305 | Standardized Item Alpha = 0.80434 |
| "Maturity" | Alpha = 0.68106 | Standardized Item Alpha = 0.68175 |
| "Arrangement" | Alpha = 0.79076 | Standardized Item Alpha = 0.79067 |
| "Helpfulness" | Alpha = 0.71547 | Standardized Item Alpha = 0.73240 |
| "Overall Impression" | Alpha = 0.74093 | Standardized Item Alpha = 0.74936 |

# of cases = 69.0

Evaluating Heuristic Internalization. The same evaluators who measured the quality of the invention sequences also evaluated heuristic internalization. They were asked to read the questions and report what heuristic method they believed the student used to write these questions. In Table 2.4, the two reliability scales illustrate (1) overall agreement with the intended heuristic method, and (2) the reliability among the evaluators themselves.

Table 2.4

CORRELATION MATRIX AND ALPHA RELIABILITIES FOR THE EVALUATION OF HEURISTIC INTERNALIZATION

Correlation Matrix

| | Heuristic | I | II | III |
|---|---|---|---|---|
| Heuristic | 1.00000 | | | |
| I | 0.67727 | 1.00000 | | |
| II | 0.95266 | 0.70360 | 1.00000 | |
| III | 0.62213 | 0.51172 | 0.62335 | 1.00000 |

RELIABILITY Coefficients

4 Items

Alpha = 0.89733 Standardized Item Alpha = 0.89551

3 Items

Alpha = 0.82691 Standardized Item Alpha = 0.82608

# of cases = 45.0

Although this chapter reports an extremely detailed methodology, the general approach can be summarized briefly: an attempt to calculate accurately the quantitative and qualitative growth of ideas among sixty-nine freshman writers in four groups--three of which inquired into the nature of their subject using three different, computer-prompted, heuristic strategies.

Surely some revelations are at hand.

# CHAPTER 3

## Findings

Patrick Suppes (1973) once selected a passage from the closing of Hume's Enquires Concerning Human Understanding as a text for one of his educational "sermons." Hume's canonical lines seem appropriate here:

> If we take in our hand any volume . . . let us ask, Does it contain any abstract reasoning concerning quantity or number? No. Does it contain any experimental reasoning concerning matters of fact and existence? No. Commit it then to the flames: for it can contain nothing but sophistry and illusion. (p. 6)

Hume's hard line empiricism has its time and its place, or so Suppes contended in his article, "Facts and Fantasies of Education." This chapter is such a place.

Empirical results about invention and cognitive strategies, however, are bound to be perplexing since they must measure what our intuitions tell us is unmeasurable. Evaluating ideas, after all, is much different than counting a horse's teeth. What this inductive paradox may testify to, I hope, is that important questions are being asked. At least, the flammable notions found here are empirically based.

The following data analyses present findings of the ten hypotheses. The statistical analyses were interactively completed using The University of Pittsburgh's Statistical Package for the Social Sciences - 10 (SPSS-10, 24 November 1977.)

Results for Hypothesis One -- Attitude

Since the attitude results are not analyzed separately for the three heuristic treatments, the major question actually being asked is: "How did freshman composition students like computer-assisted invention?" Overall, the findings were positive. Table 3.1 illustrates the absolute mean scores for each of the twenty-five items listed in Appendix F, ranked on a

five-point Likert scale, and the relative percentages of the five categories.

Generalizing over all of the subjects, the strongest agreement was with statements one ("I think freshman college students generally need help with prewriting"), nine ("The computer program made me think"), and twenty-four ("From experiencing this instruction, I understand how heuristic questions could be applied to lots of topics"). The strongest disagreement was registered in response to this statement: "The entire experience was useless". All of these results demonstrated favorable attitudes toward these particular aspects of the CAI treatment. The grand mean for all twenty-five questions was 3.6404, slightly above the hypothesized 3.5 criterion.

Results of Hypothesis Two--Rates of Completing Treatment

Hypothesis two--that over ninety-five percent of the experimental subjects would sustain the invention dialogue under the imposed experimental conditions for thirty minutes--was supported. Fifty-two of the fifty-three subjects (98.1%) worked until the research assistant had them command the program to "stop!" Across the experimental groups, all of the subjects in the Aristotelian and Burke groups worked for the posttest's

Table 3.1

Attitude Means and Likert Percentages

| Statement | Mean | Percentages | | | | | Positive/ Negative Statement |
|---|---|---|---|---|---|---|---|
| | | SA | A | UN | D | SD* | |
| 1 | 4.33 | 43.7 | 50 | 4.2 | 0 | 2.1 | P |
| 2 | 3.10 | 16.7 | 20.8 | 27.1 | 27.1 | 8.3 | P |
| 3 | 3.92 | 31.2 | 37.5 | 25 | 4.2 | 2.1 | P |
| 4 | 3.64 | 20.8 | 39.6 | 25 | 4.2 | 2.1 | P |
| 5 | 4.10 | 45.8 | 31.2 | 14.6 | 4.2 | 4.2 | P |
| 6 | 3.60 | 16.7 | 45.8 | 20.8 | 14.6 | 2.1 | P |
| 7 | 3.64 | 14.6 | 47.9 | 27.1 | 8.3 | 2.1 | P |
| 8 | 3.79 | 10.4 | 68.8 | 10.4 | 10.4 | 0 | P |
| 9 | 4.35 | 39.6 | 56.2 | 4.2 | 0 | 0 | P |
| 10 | 2.97 | 14.6 | 20.8 | 20.8 | 35.4 | 8.3 | N |
| 11 | 3.48 | 8.3 | 39.6 | 45.8 | 4.2 | 2.1 | P |
| 12 | 3.71 | 14.6 | 56.2 | 14.6 | 14.6 | 0 | P |
| 13 | 3.04 | 6.2 | 27.1 | 35.4 | 27.1 | 4.2 | P |
| 14 | 4.42 | 0 | 0 | 6.2 | 45.8 | 47.9 | N |
| 15 | 3.81 | 14.6 | 64.6 | 10.4 | 8.3 | 2.1 | P |
| 16 | 3.96 | 0 | 2.1 | 16.7 | 64.6 | 16.7 | N |
| 17 | 3.60 | 6.2 | 16.7 | 6.2 | 52.1 | 18.8 | N |
| 18 | 2.98 | 0 | 33.3 | 33.3 | 31.2 | 2.1 | P |
| 19 | 3.69 | 10.4 | 56.2 | 25 | 8.3 | 0 | P |
| 20 | 2.58 | 8.3 | 14.6 | 22.9 | 35.4 | 18.8 | P |
| 21 | 3.25 | 8.3 | 47.9 | 14.6 | 18.8 | 10.4 | P |
| 22 | 3.77 | 16.7 | 56.2 | 16.7 | 8.3 | 2.1 | P |
| 23 | 3.62 | 4.2 | 70.8 | 12.5 | 8.3 | 4.2 | P |
| 24 | 4.00 | 16.7 | 72.9 | 6.2 | 2.1 | 2.1 | P |
| 25 | 3.66 | 6.2 | 62.5 | 22.9 | 8.3 | 0 | P |

Grand Mean=3.6404

*SA--strongly agree
A--agree
UN--undecided
D--disagree
SD--strongly disagree

duration; the one subject who worked for twenty minutes on the tagmemic questions reported that she was being asked to answer the identical questions she had seen earlier in the practice session. Though the probability for this happening is low, less than one percent, it may have happened. Certainly, she was being asked three types of questions--particle, wave, and field. Copies of the practice session were not printed due to budget limitations, so it was impossible to verify the repetition. In terms of the percentage of interaction treatment minutes, the students worked for 1580 out of a possible 1590 treatment minutes, or 99.4% of the alloted time. An encouraging descriptive finding was that several students objected to ending their sessions; they wished to continue the inquiry and reported that thirty minutes was too short a time to think about their topic. This specific complaint was not heard from the students in the control group; if anything, thirty minutes <u>seemed</u> a long time for them.

Results of Hypothesis Three--Construct Validity

For the three experimental groups, the number of times they answered a question once and the number of times they extended their answers were counted. All of the groups exceeded the hypothesized criteria for answering and elaborating their answers. The specific hypothesis was that experimental subjects would answer seventy-five percent of the non-data conditioned questions presented in the thirty minute posttest and extend their inquiry at least sixty percent of the time. The Aristotle group answered their questions 97.25% of the time and extended their inquiry 90.02% of the time. The subjects undergoing the Burke treatment answered their first question 91.24% of the time and elaborated their answers 69.25% of the time. The tagmemic subjects answered their first questions 92.28% of the time and gave additional information 77.73% of the time.

Results of the analysis of variance on these data indicated no significant difference among the groups regarding their ability to answer the heuristic question the first time ($F=1.072$, $p=.350$; see Table 3.2); however, a statistically significant difference among the groups on their elaboration performance was discovered ($F=3.927$, $p=.026$; see Table 3.3). Additionally, an analysis of covariance by group with

Table 3.2

ANALYSIS OF VARIANCE FOR HEURISTIC ANSWERING RATE
AMONG THREE EXPERIMENTAL GROUPS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Main effects | 375.186 | 2 | 187.593 | 1.072 | 0.350 |
| Group | 375.186 | 2 | 187.593 | 1.072 | 0.350 |
| Explained | 375.186 | 2 | 187.593 | 1.072 | 0.350 |
| Residual | 8750.625 | 50 | 175.013 | | |
| Total | 9125.811 | 52 | 175.496 | | |

53 cases were processed.

Table 3.3

ANALYSIS OF VARIANCE FOR HEURISTIC ELABORATION RATE
AMONG THREE EXPERIMENTAL GROUPS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Main effects | 3912.391 | 2 | 1956.196 | 3.927 | 0.026 |
| Group | 3912.391 | 2 | 1956.196 | 3.927 | 0.026 |
| Explained | 3912.391 | 2 | 1956.196 | 3.927 | 0.026 |
| Residual | 24908.477 | 50 | 498.170 | | |
| Total | 28820.868 | 52 | 554.247 | | |

53 cases were processed.

the SAT verbal score (two missing cases) as the covariate verified the above significant finding ($F=3.535$, $p=.037$; see Table 3.4). A multiple classification analysis of the analysis of covariance (Table 3.5) was performed to confirm the observed trends seen in the raw percentage performances, i.e. the topoi group most easily extended their answers and the pentad group, for possible reasons discussed in the next chapter, did not greatly elaborate their initial remarks.

Results for Hypothesis Four--Individual Quantitative Gains

After the total proposition count had been completed, the fifteen-minute pretest score was doubled so that it could be more appropriately compared to the individual's thirty-minute posttest score. Tables 3.6 to 3.9 present these results in the four groups. Briefly, though, all three experimental groups showed statistically significant gains, while the control group suffered a statistically significant decrease in the quantity of ideas. In the pretest, the nineteen members of the topic group listed an average of 35.5789 ideas; the seventeen members of the Burke group listed 30.7647

Table 3.4

ANALYSIS OF COVARIANCE FOR HEURISTIC ELABORATION RATE
AMONG THREE EXPERIMENTAL GROUPS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 352.668 | 1 | 352.668 | 0.691 | 0.410 |
| SAT Verbal | 352.668 | 1 | 352.668 | 0.691 | 0.410 |
| Main effects | 3606.445 | 2 | 1803.222 | 3.535 | 0.037 |
| Group | 3606.445 | 2 | 1803.223 | 3.535 | 0.037 |
| Explained | 3959.113 | 3 | 1319.704 | 2.587 | 0.064 |
| Residual | 23975.868 | 47 | 510.125 | | |
| Total | 27934.980 | 50 | 558.700 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.036 |

53 cases were processed.
2 cases (3.8%) were missing.

Table 3.5

MULTIPLE CLASSIFICATION ANALYSIS FOR HEURISTIC ELABORATION RATE
AMONG THREE EXPERIMENTAL GROUPS

Grand mean = 80.02

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Group | | | | | | | |
| Aristotle | 19 | 9.93 | | | | 9.81 | |
| Burke | 17 | -10.78 | | | | -10.83 | |
| Tagmemic | 15 | -0.35 | | | | -0.12 | |
| | | | 0.37 | | | | 0.36 |
| Multiple R squared | | | | | | | .142 |
| Multiple R | | | | | | | .376 |

Table 3.6

RESULTS OF TWO-TAILED T-TEST FOR CORRELATED SAMPLES ON QUANTITY OF IDEAS WITHIN ARISTOTLE GROUP

| VARIABLE | NUMBER OF CASES | MEAN | STANDARD DEVIATION | STANDARD ERROR | (DIFFERENCE) MEAN | STANDARD DEVIATION | STANDARD ERROR |
|---|---|---|---|---|---|---|---|
| Pretest | 19 | 35.5789 | 12.959 | 2.973 | -90.3684 | 47.321 | 10.856 |
| Posttest | | 125.9474 | 46.741 | 10.723 | | | |
| Adjusted Pretest | 19 | 71.1579 | 25.917 | 5.946 | -54.7895 | 51.280 | 11.764 |
| Posttest | | 125.9474 | 46.741 | 10.723 | | | |

| | CORR. | 2-TAIL PROB. | T VALUE | DEGREES OF FREEDOM | 2-TAIL PROB. |
|---|---|---|---|---|---|
| Table (cont.) | 0.094 | 0.703 | -8.32 | 18 | 0.000 |
| | 0.094 | 0.703 | -4.66 | 18 | 0.000 |

Table 3.7

RESULTS OF TWO-TAILED T-TEST FOR CORRELATED SAMPLES ON QUANTITY OF IDEAS WITHIN BURKE GROUP

| VARIABLE | NUMBER OF CASES | MEAN | STANDARD DEVIATION | STANDARD ERROR | (DIFFERENCE) MEAN | STANDARD DEVIATION | STANDARD ERROR |
|---|---|---|---|---|---|---|---|
| Pretest | 17 | 30.7647 | 19.842 | 4.812 | -102.4118 | 57.724 | 14.000 |
| Posttest | | 133.1765 | 54.985 | 13.336 | | | |
| Adjusted Pretest | 17 | 61.5294 | 39.683 | 9.625 | -71.6471 | 66.543 | 16.139 |
| Posttest | | 133.1765 | 54.985 | 13.336 | | | |

| | CORR. | 2-TAIL PROB. | T VALUE | DEGREES OF FREEDOM | 2-TAIL PROB. |
|---|---|---|---|---|---|
| table (cont.) | 0.039 | 0.882 | -7.32 | 16 | 0.000 |
| | 0.039 | 0.882 | -4.44 | 16 | 0.000 |

Table 3.8

RESULTS OF TWO-TAILED T-TEST FOR CORRELATED SAMPLES ON QUANTITY OF IDEAS WITHIN TAGMEMIC GROUP

| VARIABLE | NUMBER OF CASES | MEAN | STANDARD DEVIATION | STANDARD ERROR | (DIFFERENCE) MEAN | STANDARD DEVIATION | STANDARD ERROR |
|---|---|---|---|---|---|---|---|
| Pretest | 17 | 27.2353 | 14.977 | 3.633 | -80.4118 | 63.366 | 15.369 |
| Posttest | | 107.6471 | 55.851 | 13.546 | | | |
| Adjusted Pretest | 17 | 54.4706 | 29.954 | 7.265 | -53.1765 | 73.211 | 17.756 |
| Posttest | | 107.6471 | 55.851 | 13.546 | | | |

| | CORR. | 2-TAIL PROB. | T VALUE | DEGREES OF FREEDOM | 2-TAIL PROB. |
|---|---|---|---|---|---|
| table (cont.) | -0.401 | 0.110 | -5.23 | 16 | 0.000 |
| | -0.401 | 0.110 | -2.99 | 16 | 0.009 |

Table 3.9

RESULTS OF TWO-TAILED T-TEST FOR CORRELATED SAMPLES ON QUANTITY OF IDEAS WITHIN CONTROL GROUP

| VARIABLE | NUMBER OF CASES | MEAN | STANDARD DEVIATION | STANDARD ERROR | (DIFFERENCE) MEAN | STANDARD DEVIATION | STANDARD ERROR |
|---|---|---|---|---|---|---|---|
| Pretest | 16 | 29.4375 | 12.011 | 3.003 | -15.5625 | 15.196 | 3.799 |
| Posttest | | 45.0000 | 17.154 | 4.289 | | | |
| Adjusted Pretest | 16 | 58.8750 | 24.022 | 6.005 | 13.8750 | 21.357 | 5.339 |
| Posttest | | 45.0000 | 17.154 | 4.289 | | | |

| | CORR. | 2-TAIL PROB. | T VALUE | DEGREES OF FREEDOM | 2-TAIL PROB. |
|---|---|---|---|---|---|
| table (cont.) | 0.504 | 0.047 | -4.10 | 15 | 0.001 |
| | 0.504 | 0.047 | 2.60 | 15 | 0.020* |

*Represents a significant decrease.

ideas; the seventeen students in the tagmemic class listed an average of 27.2353 ideas; and the sixteen students in the control class wrote an average of 29.4375 ideas in the allotted fifteen minutes. In the posttest, the members of the Burke class wrote an average of 133.1765 ideas per student; those students in the Aristotle class wrote an average of 125.9474 ideas; the individuals in the tagmemic group wrote 107.6471 ideas per student. The control group, interestingly, wrote an average of 45 ideas per student in the thirty minutes, not even double the ideas they were able to write in the fifteen-minute exercise. The slight edge which the Burke group achieved over the other experimental groups as well as the decline of ideas for the control group will analyzed more precisely in the results section for hypothesis seven.

Results of Hypothesis Five--Individual Qualitative Gains

A t-test for correlated samples found that all individuals including those in the control group made qualitative gains, though the gains in the control group lagged behind the individual gains experienced by those in the experimental groups. No adjustments were made for the time differences. As Table 3.10 illustrates, the "factuality, surprise value, insightfulness" category saw all individuals make a statistically significant increase ($p=.000$* for the experimental groups; $p=.011$ for the control group). The comprehensiveness category, reported on Table 3.11, saw a statistically significant gain among the members of the three experimental groups ($p=.000$ for the Aristotle and tagmemic treatment; $p=.001$ for the Burke treatment). In this category, however, the control group's individual gains failed to reach significance ($p=.177$). The category regarding the evidence of the intellectual processing (see Table 3.12) again saw significant individual gains ($p=.000$) in all experimental groups. However, the control group's individual performances approached but did not reach a statistically significant figure ($p=.052$). Table 3.13 reports the results of the

* The SPSS-10 program calculates significance only to three decimal places.

Table 3.10

RESULTS OF TWO-TAILED T-TEST FOR CORRELATED SAMPLES ON FACTUALITY, SURPRISE VALUE, AND INSIGHTFULNESS WITHIN EACH GROUP

| GROUP | VARIABLE | NUMBER OF CASES | MEAN | STANDARD DEVIATION | STANDARD ERROR | (DIFFERENCE) MEAN | STANDARD DEVIATION | STANDARD ERROR |
|---|---|---|---|---|---|---|---|---|
| Aristotle | Pretest | 19 | 5.5263 | 2.195 | 0.504 | -4.6842 | 2.583 | 0.593 |
| | Posttest | | 10.2105 | 2.299 | 0.527 | | | |
| Burke | Pretest | 17 | 4.6471 | 1.766 | 0.428 | -4.4118 | 2.830 | 0.686 |
| | Posttest | | 9.0588 | 2.277 | 0.552 | | | |
| Tagmemic | Pretest | 17 | 4.4118 | 1.583 | 0.384 | -4.6471 | 3.408 | 0.827 |
| | Posttest | | 9.0588 | 2.384 | 0.578 | | | |
| Control | Pretest | 16 | 4.5625 | 1.672 | 0.418 | -1.3750 | 1.893 | 0.473 |
| | Posttest | | 5.9375 | 1.879 | 0.470 | | | |

table (cont.)

| | CORR. | 2-WAY PROB. | T VALUE | DEGREES OF FREEDOM | 2-TAIL PROB. |
|---|---|---|---|---|---|
| Aristotle... | 0.340 | 0.154 | -7.90 | 18 | 0.000 |
| Burke... | 0.037 | 0.889 | -6.43 | 16 | 0.000 |
| Tagmemic... | -0.454 | 0.067 | -5.62 | 16 | 0.000 |
| Control... | 0.436 | 0.091 | -2.91 | 15 | 0.011 |

Table 3.11

RESULTS OF TWO-TAILED T-TEST FOR CORRELATED SAMPLES ON COMPREHENSIVENESS WITHIN EACH GROUP

| GROUP | VARIABLE | NUMBER OF CASES | MEAN | STANDARD DEVIATION | STANDARD ERROR | (DIFFERENCE) MEAN | STANDARD DEVIATION | STANDARD ERROR |
|---|---|---|---|---|---|---|---|---|
| Aristotle | Pretest | 19 | 6.0526 | 2.147 | 0.492 | -3.8947 | 3.398 | 0.779 |
| | Posttest | | 9.9474 | 2.697 | 0.619 | | | |
| Burke | Pretest | 17 | 5.1765 | 2.069 | 0.502 | -3.3529 | 3.220 | 0.781 |
| | Posttest | | 8.5294 | 2.503 | 0.607 | | | |
| Tagmemic | Pretest | 17 | 4.3529 | 1.693 | 0.411 | -4.0588 | 3.631 | 0.881 |
| | Posttest | | 8.4118 | 2.599 | 0.630 | | | |
| Control | Pretest | 16 | 5.3750 | 2.217 | 0.554 | -0.9375 | 2.645 | 0.661 |
| | Posttest | | 6.3125 | 2.549 | 0.637 | | | |

| | | CORR. | 2-WAY PROB. | T VALUE | DEGREES OF FREEDOM | 2-TAIL PROB. |
|---|---|---|---|---|---|---|
| table (cont.) | Aristotle... | 0.029 | 0.905 | -5.00 | 18 | 0.000 |
| | Burke... | 0.017 | 0.948 | -4.29 | 16 | 0.001 |
| | Tagmemic... | -0.404 | 0.108 | -4.61 | 16 | 0.000 |
| | Control... | 0.391 | 0.135 | -1.42 | 15 | 0.177 |

Table 3.12

RESULTS OF TWO-TAILED T-TEST FOR CORRELATED SAMPLES ON EVIDENCE OF INTELLECTUAL PROCESSING WITHIN EACH GROUP

| GROUP | VARIABLE | NUMBER OF CASES | MEAN | STANDARD DEVIATION | STANDARD ERROR | (DIFFERENCE) MEAN | STANDARD DEVIATION | STANDARD ERROR |
|---|---|---|---|---|---|---|---|---|
| | Pretest | | 5.8947 | 1.792 | 0.411 | | | |
| Aristotle | | 19 | | | | -4.4737 | 2.220 | 0.509 |
| | Posttest | | 10.3684 | 2.432 | 0.558 | | | |
| | Pretest | | 5.5000 | 1.414 | 0.354 | | | |
| Burke | | 16 | | | | -1.0625 | 2.016 | 0.504 |
| | Posttest | | 6.5625 | 2.128 | 0.532 | | | |
| | Pretest | | 5.4118 | 1.770 | 0.429 | | | |
| Tagmemic | | 17 | | | | -3.7059 | 2.443 | 0.593 |
| | Posttest | | 9.1176 | 2.118 | 0.514 | | | |
| | Pretest | | 4.4706 | 1.663 | 0.403 | | | |
| Control | | 17 | | | | -5.4706 | 3.448 | 0.836 |
| | Posttest | | 9.9412 | 2.461 | 0.597 | | | |

| | | CORR. | 2-WAY PROD. | T VALUE | DEGREES OF FREEDOM | 2-TAIL PROB. |
|---|---|---|---|---|---|---|
| | Aristotle... | 0.481 | 0.037 | -8.78 | 18 | 0.000 |
| table (cont.) | Burke... | 0.220 | 0.397 | -6.25 | 16 | 0.000 |
| | Tagmemic... | -0.375 | 0.139 | -6.54 | 16 | 0.000 |
| | Control... | 0.410 | 0.115 | -2.11 | 15 | 0.052 |

Table 3.13

RESULTS OF TWO-TAILED T-TEST FOR CORRELATED SAMPLES ON OVERALL QUALITY WITHIN EACH GROUP

| GROUP | VARIABLE | NUMBER OF CASES | MEAN | STANDARD DEVIATION | STANDARD ERROR | (DIFFERENCE) MEAN | STANDARD DEVIATION | STANDARD ERROR |
|---|---|---|---|---|---|---|---|---|
| Aristotle | Pretest | 19 | 5.5263 | 1.806 | 0.414 | -4.5789 | 2.545 | 0.584 |
| | Posttest | | 10.1053 | 2.492 | 0.572 | | | |
| Burke | Pretest | 17 | 4.7059 | 1.896 | 0.460 | -3.7647 | 3.011 | 0.730 |
| | Posttest | | 8.4706 | 2.478 | 0.601 | | | |
| Tagmemic | Pretest | 17 | 4.3529 | 1.618 | 0.392 | -4.7059 | 3.771 | 0.915 |
| | Posttest | | 9.0588 | 2.703 | 0.656 | | | |
| Control | Pretest | 16 | 4.7500 | 1.949 | 0.487 | -1.2500 | 2.352 | 0.588 |
| | Posttest | | 6.0000 | 2.000 | 0.500 | | | |

| | | CORR. | 2-WAY PROB. | T VALUE | DEGREES OF FREEDOM | 2-TAIL PROB. |
|---|---|---|---|---|---|---|
| table (cont.) | Aristotle... | 0.333 | 0.164 | -7.84 | 18 | 0.000 |
| | Burke... | 0.071 | 0.786 | -5.16 | 16 | 0.000 |
| | Tagmemic... | -0.491 | 0.045 | -5.15 | 16 | 0.000 |
| | Control... | 0.291 | 0.275 | -2.13 | 15 | 0.051 |

overall quality of these pre-post lists if ideas. Again, all of the experimental treatments yielded a $p=.000$ significant level while the control group's individual performances did not quite yield a significant number ($p=.051$).

Perhaps, it not surprising that an increase in the treatment time "ought" to mean an increase in the quality of what is written. These results indicate, in a strict inferential model at least, that facts and insights increase for individuals, but that the comprehensiveness of their inquiry, the flexibility of their intellectual repertoire, and the net qualitative effect could have as easily occurred by chance. What this finding may suggest is that the time spent stimulating invention perhaps should be devoted to comprehensive systems and heuristics which immediately encourage interaction, but more of this in the following chapter. Let it suffice to say that since gains occurred in all groups, the more discriminating qualitative hypothesis is hypothesis eight, since it attempts to show the extent of the differences among the groups.

Results of Hypothesis Six--Heuristic Internalization

The results of the internalization hypothesis showed that members of each experimental group did indeed remember and could generate some recognizable heuristic questions. The mean performances on a four-point scale were 3.7 for the Aristotle treatment, 3.41 for the Burke treatment, and 3.14 for the tagmemic treatment. An analysis of covariance with the SAT verbal score and the ECT score as the covariables (see Table 3.14), however, showed no significant difference among the groups ($F=1.783$, $p=.182$). A multiple classification analysis (see Table 3.15) indicated a slight trend favoring the internalization or the "clear-cut" recognizability of Aristotelian topoi, a finding which will be elaborated upon in the next chapter. The trend also showed that either the tagmemic method was the most difficult heuristic for generating "recognizable" questions or that the evaluators had the most difficulty recognizing students' "tagmemic" renditions. Finally, the Burke heuristic approach remained in the middle--surprisingly since the who, what, where, when, and why strategy was assumed to be the most familiar.

Table 3.14

ANALYSIS OF COVARIANCE FOR HEURISTIC INTERNALIZATION
AMONG THREE EXPERIMENTAL GROUPS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 2.391 | 2 | 1.195 | 1.569 | 0.221 |
| SATV | 0.877 | 1 | 0.877 | 1.151 | 0.290 |
| ECT | 2.388 | 1 | 2.388 | 3.136 | 0.085 |
| Main effects | 2.715 | 2 | 1.358 | 1.783 | 0.182 |
| Groups | 2.715 | 2 | 1.358 | 1.783 | 0.182 |
| Explained | 5.106 | 4 | 1.276 | 1.676 | 0.176 |
| Residual | 28.941 | 38 | 0.762 | | |
| Total | 34.047 | 42 | 0.811 | | |

45 cases were processed
18 cases (19.9%) were missing.

Table 3.15

MULTIPLE CLASSIFICATION ANALYSIS FOR HEURISTIC INTERNALIZATION
AMONG THREE EXPERIMENTAL GROUPS

Grand mean = #.#&

| Variable + category | N | Unadjusted Dev'n | Unadjusted Eta | Adjusted for independents Dev'n | Adjusted for independents Beta | Adjusted for independents + covariates Dev'n | Adjusted for independents + covariates Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 16 | 0.32 | | | | 0.29 | |
| Burke | 15 | -0.04 | | | | -0.03 | |
| Tagmemic | 12 | -0.37 | | | | -0.36 | |
| | | | 0.31 | | | | 0.29 |
| Multiple R squared | | | | | | | .150 |
| Multiple R | | | | | | | .387 |

Results of Hypothesis Seven--Quantity Among Groups

Hypothesis seven--that there is no difference in the quantitative performance on a pretest and a posttest among the four groups--was rejected, for statistically significant differences were discovered among the four groups. First of all, though, an analysis of covariance on the pretest performance, with the SAT verbal and the ECT scores as covariables, showed no statistically significant difference among the four groups ($F=1.050$, $p=.378$; see Table 3.16). Moreover, a multiple classification analysis (Table 3.17) ranked the quantitative pretest performances as follows: (1) Aristotle, (2) control, (3) Burke, and (4) tagmemic.

As Table 3.18 illustrates, the results of an analysis of covariance, with the SAT verbal and the ECT scores as covariables, on the posttest was statistically significant ($F=12.334$, $p=.000$). The multiple classification analysis in Table 3.19 shows that the performance ranks switched from the pretest: now (1) Burke, (2) Aristotle, (3) tagmemic, and (4) control. Even more important, this significance level is gained because the control group bears the entire burden of both the unadjusted deviation and the adjusted deviation. Consequently, as the Beta illustrates, the

Table 3.16

ANALYSIS OF COVARIANCE FOR PRETEST QUANTITY OF IDEAS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 1549.010 | 2 | 774.505 | 3.583 | 0.034 |
| SATV | 121.033 | 1 | 121.033 | 0.560 | 0.457 |
| ECT | 430.028 | 1 | 430.028 | 1.990 | 0.164 |
| Main effects | 680.898 | 3 | 226.966 | 1.050 | 0.378 |
| Groups | 680.898 | 3 | 226.966 | 1.050 | 0.378 |
| Explained | 2229.908 | 5 | 445.982 | 2.063 | 0.084 |
| Residual | 11887.863 | 55 | 216.143 | | |
| Total | 14117.771 | 60 | 235.296 | | |

69 cases were processed
8 cases (11.6%) were missing.

Table 3.17

MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST QUANTITY OF IDEAS

Grand mean = 30.34

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 18 | 5.38 | | | | 4.87 | |
| Burke | 15 | -2.28 | | | | -0.72 | |
| Tagmemic | 14 | -3.27 | | | | -1.57 | |
| Control | 14 | -1.20 | | | | -3.92 | |
| | | | 0.23 | | | | 0.22 |
| Multiple R squared | | | | | | | .158 |
| Multiple R | | | | | | | .397 |

Table 3.18

ANALYSIS OF COVARIANCE FOR POSTTEST QUANTITY OF IDEAS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 3345.395 | 2 | 1672.698 | 0.952 | 0.392 |
| SATV | 2811.602 | 1 | 2811.692 | 1.600 | 0.211 |
| ECT | 334.314 | 1 | 334.314 | 0.190 | 0.664 |
| Main effects | 65013.023 | 3 | 21671.008 | 12.334 | 0.000 |
| Groups | 65013.023 | 3 | 21671.008 | 12.334 | 0.000 |
| Explained | 68358.419 | 5 | 13671.684 | 7.781 | 0.000 |
| Residual | 96639.024 | 55 | 1757.073 | | |
| Total | 164997.443 | 60 | 2749.957 | | |

69 cases were processed.
9 cases (11.6%) were missing.

Table 3.19

MULTIPLE CLASSIFICATION ANALYSIS FOR POSTTEST QUANTITY OF IDEAS

Grand mean = 98.67

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 18 | 21.55 | | | | 21.68 | |
| Burke | 15 | 26.39 | | | | 27.63 | |
| Tagmemic | 14 | 0.90 | | | | 2.18 | |
| Control | 14 | -56.89 | | | | -59.66 | |
| | | | 0.62 | | | | 0.65 |
| Multiple R squared | | | | | | | .414 |
| Multiple R | | | | | | | .644 |

groups are more unlike each other after the covariate adjustments. This finding may be the one finding in which we may have the "greatest confidence." The CAI-units stimulated lots of ideas, many more than students without this treatment were able to generate.

Among the three experimental groups, an analysis of covariance found the pretest main effects not statistically significant ($F=1.006$; $p=.373$; see Table 3.20); the multiple classification analysis here (Table 3.21) ranked the pretest performances: (1) Aristotle, (2) Burke, and (3) tagmemics. The analysis of covariance found the posttest difference for main effects even less significant ($F=.805$; $p=.453$; see Table 3.22); the multiple classification analysis in Table 3.23 revealing these changed rankings: (1) Burke, (2) Aristotle, and (3) tagmemics. The identical Beta shows that these three groups have virtually remained unchanged after the covariate adjustment.

Table 3.20

ANALYSIS OF COVARIANCE FOR PRETEST QUANTITY OF IDEAS
AMONG THREE EXPERIMENTAL GROUPS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 1212.504 | 1 | 1212.504 | 4.890 | 0.032 |
| SATV | 1212.504 | 1 | 1212.504 | 4.890 | 0.032 |
| Main effects | 498.770 | 2 | 249.385 | 1.006 | 0.373 |
| Groups | 498.770 | 2 | 249.385 | 1.006 | 0.373 |
| Explained | 1711.274 | 3 | 570.425 | 2.301 | 0.089 |
| Residual | 11652.766 | 47 | 247.931 | | |
| Total | 13364.039 | 50 | 267.281 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.067 |

53 cases were processed.
2 cases (3.8%) were missing.

Table 3.21

MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST QUANTITY OF IDEAS
AMONG THREE EXPERIMENTAL GROUPS

Grand mean = 31.20

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 4.38 | | | | 3.43 | |
| Burke | 17 | -0.43 | | | | 0.03 | |
| Tagmemic | 15 | -5.06 | | | | -4.38 | |
| | | | 0.24 | | | | 0.20 |

| | |
|---|---|
| Multiple R squared | .128 |
| Multiple R | .358 |

Table 3.22

ANALYSIS OF COVARIANCE FOR POSTTEST QUANTITY OF IDEAS
AMONG THREE EXPERIMENTAL GROUPS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 57.709 | 1 | 57.709 | 0.020 | 0.889 |
| SATV | 57.709 | 1 | 57.709 | 0.020 | 0.889 |
| Main effects | 4702.555 | 2 | 2351.278 | 0.805 | 0.453 |
| Groups | 4702.555 | 2 | 2351.278 | 0.805 | 0.453 |
| Explained | 4760.264 | 3 | 1586.755 | 0.544 | 0.655 |
| Residual | 137198.365 | 47 | 2919.114 | | |
| Total | 141958.629 | 50 | 2839.173 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.015 |

53 cases were processed.
2 cases (3.8%) were missing.

Table 3.23

MULTIPLE CLASSIFICATION ANALYSIS FOR POSTTEST QUANTITY OF IDEAS
AMONG THREE EXPERIMENTAL GROUPS

Grand mean = 123.45

| Variable + category | N | Unadjusted Dev'n | Unadjusted Eta | Adjusted for independents Dev'n | Adjusted for independents Beta | Adjusted for independents + covariates Dev'n | Adjusted for independents + covariates Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 2.50 | | | | 2.37 | |
| Burke | 17 | 9.73 | | | | 9.79 | |
| Tagmemic | 15 | -14.18 | | | | -14.10 | |
| | | | 0.18 | | | | 0.18 |
| Multiple R squared | | | | | | | .034 |
| Multiple R | | | | | | | .183 |

Results of Hypothesis Eight--Qualitative Group Performances

In general, the results of the four qualitative distinctions found significant differences in favor of the three heuristic treatments. In every category, after the deviation on the posttests had been adjusted for the covariables--SAT verbal and ECT scores--the control group was entirely responsible for the negative values. Furthermore, the additional analyses of covariance--with the SAT verbal score as the single covariable--run on the three heuristic treatments themselves found more significant differences on the pretest than on the posttest. In other words, the treatments were making the three experimental groups more alike with respect to their collective insightfulness, comprehensiveness, intellectual ability, and overall qualitative performance. The following pages present these particular findings in detail.

Factuality, Surprise Value, Insightfulness. An analysis of covariance found no significant difference on the pretest for this qualitative category ($F=1.516$, $p=.220$; see Table 3.24). The multiple classification analysis (Table 3.25) showed the Aristotle group ranked first; control, second; Burke, third; and the tagmemic group, fourth. The posttest's analysis of covariance

Table 3.24

ANALYSIS OF COVARIANCE FOR PRETEST FACTUALITY, SURPRISE VALUE, AND INSIGHTFULNESS OF IDEAS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 11.743 | 2 | 5.871 | 1.812 | 0.173 |
| SATV | 0.960 | 1 | 0.960 | 0.296 | 0.589 |
| ECT | 3.191 | 1 | 3.191 | 0.985 | 0.325 |
| Main effects | 14.740 | 3 | 4.913 | 1.516 | 0.220 |
| Groups | 14.740 | 3 | 4.913 | 1.516 | 0.220 |
| Explained | 26.483 | 5 | 5.297 | 1.635 | 0.166 |
| Residual | 178.206 | 55 | 3.240 | | |
| Total | 204.689 | 60 | 3.411 | | |

69 cases were processed
8 cases (11.6%) were missing.

Table 3.25

MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST FACTUALITY, SURPRISE VALUE, AND INSIGHTFULNESS OF IDEAS

Grand mean = 4.70

| Variable + category | N | Unadjusted Dev'n | Unadjusted Eta | Adjusted for independents Dev'n | Adjusted for independents Beta | Adjusted for independents + covariates Dev'n | Adjusted for independents + covariates Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 18 | 0.80 | | | | 0.75 | |
| Burke | 15 | -0.37 | | | | -0.24 | |
| Tagmemic | 14 | -0.42 | | | | -0.28 | |
| Control | 14 | -0.20 | | | | -0.43 | |
| | | | 0.28 | | | | 0.27 |
| Multiple R squared | | | | | | | .129 |
| Multiple R | | | | | | | .360 |

reported a significant difference among the groups ($F=13.148$, $p=.000$; see Table 3.26) with the control group bearing the full weight of the negative deviation (see Table 3.27). The ranks of the groups became (1) Aristotle, (2) tagmemics, (3) Burke, and (4) control.

Among the three heuristic groups, an analysis of covariance on the pretest scores found no significant difference ($F=1.707$; $p=.192$; see Table 3.28). The multiple classification analysis (Table 3.29) shows that the groups became more alike after the adjusted deviation calculations. As was the case for the quantitative evaluation, an analysis of covariance found that the heuristic treatments made the groups' differences even less significant ($F=.993$, $p=.378$; see Table 3.30). The multiple classification analysis (Table 3.31) indicated that the Burke treatment tended to decrease slightly while the tagmemic treatment increased that group's insightfulness; the Aristotle treatment comparatively remained more "insightful." Still, what must be emphasized is that the CAI-invention treatments made the groups more alike.

Table 3.26

ANALYSIS OF COVARIANCE FOR POSTTEST FACTUALITY, SURPRISE VALUE, AND INSIGHTFULNESS OF IDEAS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 5.239 | 2 | 2.620 | 0.567 | 0.570 |
| SATV | 0.331 | 1 | 0.331 | 0.072 | 0.790 |
| ECT | 1.594 | 1 | 1.594 | 0.345 | 0.559 |
| Main effects | 182.083 | 3 | 60.694 | 13.148 | 0.000 |
| Groups | 182.083 | 3 | 60.694 | 13.148 | 0.000 |
| Explained | 187.322 | 5 | 37.464 | 8.116 | 0.000 |
| Residual | 253.891 | 55 | 4.616 | | |
| Total | 441.213 | 60 | 7.354 | | |

69 cases were processed.
8 cases (11.6%) were missing.

Table 3.27

MULTIPLE CLASSIFICATION ANALYSIS FOR POSTTEST FACTUALITY, SURPRISE VALUE, AND INSIGHTFULNESS OF IDEAS

Grand mean = 8.48

| Variable + category | N | Unadjusted Dev'n | Unadjusted Eta | Adjusted for independents Dev'n | Adjusted for independents Beta | Adjusted for independents + covariates Dev'n | Adjusted for independents + covariates Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 18 | 1.69 | | | | 1.63 | |
| Burke | 15 | 0.26 | | | | 0.47 | |
| Tagmemic | 14 | 0.31 | | | | 0.54 | |
| Control | 14 | -2.76 | | | | -3.13 | |
| | | | 0.60 | | | | 0.66 |
| Multiple R squared | | | | | | | .425 |
| Multiple R | | | | | | | .652 |

Table 3.28

ANALYSIS OF COVARIANCE FOR PRETEST FACTUALITY, SURPRISE VALUE, AND INSIGHTFULNESS AMONG THREE EXPERIMENTAL GROUPS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 19.495 | 1 | 19.495 | 6.171 | 0.017 |
| SATV | 19.495 | 1 | 19.495 | 6.171 | 0.017 |
| Main effects | 10.784 | 2 | 5.392 | 1.707 | 0.192 |
| Groups | 10.784 | 2 | 5.392 | 1.707 | 0.192 |
| Explained | 30.279 | 3 | 10.093 | 3.195 | 0.032 |
| Residual | 148.466 | 47 | 3.159 | | |
| Total | 178.745 | 50 | 3.575 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.009 |

53 cases were processed.
2 cases (3.8%) were missing.

Table 3.29

MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST FACTUALITY, SURPRISE VALUE, AND INSIGHTFULNESS AMONG THREE EXPERIMENTAL GROUPS

Grand mean = 4.84

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 0.68 | | | | 0.57 | |
| Burke | 17 | -0.20 | | | | -0.14 | |
| Tagmemic | 15 | -0.64 | | | | -0.56 | |
| | | | 0.30 | | | | 0.25 |
| Multiple R squared | | | | | | | .169 |
| Multiple R | | | | | | | .412 |

Table 3.30

ANALYSIS OF COVARIANCE FOR POSTTEST FACTUALITY, SURPRISE VALUE, AND INSIGHTFULNESS AMONG THREE EXPERIMENTAL GROUPS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 18.987 | 1 | 18.987 | 3.500 | 0.068 |
| SATV | 18.987 | 1 | 18.987 | 3.500 | 0.068 |
| Main effects | 10.770 | 2 | 5.385 | 0.993 | 0.378 |
| Groups | 10.770 | 2 | 5.385 | 0.993 | 0.378 |
| Explained | 29.757 | 3 | 9.919 | 1.828 | 0.155 |
| Residual | 254.988 | 47 | 5.425 | | |
| Total | 284.745 | 50 | 5.695 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.008 |

53 cases were processed.
2 cases (3.8%) were missing.

Table 3.31

MULTIPLE CLASSIFICATION ANALYSIS FOR POSTTEST FACTUALITY, SURPRISE VALUE, AND INSIGHTFULNESS AMONG THREE EXPERIMENTAL GROUPS

Grand mean = 9.49

| Variable + category | N | Unadjusted Dev'n | Unadjusted Eta | Adjusted for independents Dev'n | Adjusted for independents Beta | Adjusted for independents + covariates Dev'n | Adjusted for independents + covariates Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 0.72 | | | | 0.60 | |
| Burke | 17 | -0.43 | | | | -0.38 | |
| Tagmemic | 15 | -0.42 | | | | -0.34 | |
| | | | 0.23 | | | | 0.20 |
| Multiple R squared | | | | | | | .105 |
| Multiple R | | | | | | | .323 |

Comprehensiveness. The analysis of covariance on the pretest evaluation for "comprehensiveness" found no statistically significant difference among the four groups (F=1.681, p=.182; see Table 3.32). The relative "comprehensive" performances (Table 3.33) found the groups ranked (1) Aristotle, (2) control, (3) Burke, and (4) tagmemics. The results of the posttest found a significant difference among the four groups (F=7.563, p=.000; see Table 3.34). The most comprehensive group was the Aristotle group; also, the control group, after the adjusted deviation, bore the entire negative deviation (see Table 3.35).

One of the most interesting results in this study was discovered when an analysis of covariance found a significant difference on the pretest "comprehensiveness" among the three experimental groups (F=3.613, p=.035; see Table 3.36). The multiple classification analysis (Table 3.37) illustrated that the tagmemic pretest's adjusted deviation (-1.04) was the major reason for this significant difference. The posttest analysis of covariance found no statistically significant difference among the groups (F=1.334, p=.273; see Table 3.38). Again, the multiple

Table 3.32

ANALYSIS OF COVARIANCE FOR PRETEST COMPREHENSIVENESS OF IDEAS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 15.288 | 2 | 7.644 | 1.878 | 0.163 |
| SATV | 1.135 | 1 | 1.135 | 0.279 | 0.600 |
| ECT | 4.345 | 1 | 4.345 | 1.068 | 0.306 |
| Main effects | 20.526 | 3 | 6.842 | 1.681 | 0.182 |
| Groups | 20.526 | 3 | 6.842 | 1.681 | 0.182 |
| Explained | 35.814 | 5 | 7.163 | 1.760 | 0.137 |
| Residual | 223.858 | 55 | 4.070 | | |
| Total | 259.672 | 60 | 4.328 | | |

69 cases were processed.
8 cases (11.6%) were missing.

Table 3.33

MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST COMPREHENSIVENESS OF IDEAS

Grand mean = 5.15

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 18 | 0.80 | | | | 0.76 | |
| Burke | 15 | -0.21 | | | | -0.09 | |
| Tagmemic | 14 | -1.00 | | | | -0.87 | |
| Control | 14 | 0.21 | | | | 0.00 | |
| | | | 0.32 | | | | 0.28 |
| Multiple R squared | | | | | | | .138 |
| Multiple R | | | | | | | .371 |

Table 3.34

ANALYSIS OF COVARIANCE FOR POSTTEST COMPREHENSIVENESS OF IDEAS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 9.944 | 2 | 4.972 | 0.832 | 0.441 |
| SATV | 0.361 | 1 | 0.361 | 0.060 | 0.807 |
| ECT | 7.309 | 1 | 7.309 | 1.223 | 0.274 |
| Main effects | 135.632 | 3 | 45.211 | 7.563 | 0.000 |
| Groups | 135.632 | 3 | 45.211 | 7.563 | 0.000 |
| Explained | 145.576 | 5 | 29.115 | 4.870 | 0.001 |
| Residual | 328.785 | 55 | 5.978 | | |
| Total | 474.361 | 60 | 7.906 | | |

69 cases were processed.
8 cases (11.6%) were missing.

Table 3.35

MULTIPLE CLASSIFICATION ANALYSIS FOR POSTTEST COMPREHENSIVENESS OF IDEAS

Grand mean = 8.16

| Variable + category | N | Unadjusted Dev'n | Unadjusted Eta | Adjusted for independents Dev'n | Adjusted for independents Beta | Adjusted for independents + covariates Dev'n | Adjusted for independents + covariates Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 18 | 1.72 | | | | 1.68 | |
| Burke | 15 | 0.04 | | | | 0.23 | |
| Tagmemic | 14 | -0.09 | | | | 0.12 | |
| Control | 14 | -2.16 | | | | -2.52 | |
| | | | 0.50 | | | | 0.54 |
| Multiple R squared | | | | | | | .307 |
| Multiple R | | | | | | | .554 |

Table 3.36

ANALYSIS OF COVARIANCE FOR PRETEST COMPREHENSIVENESS OF IDEAS AMONG THREE EXPERIMENTAL GROUPS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 16.551 | 1 | 16.551 | 4.424 | 0.041 |
| SATV | 16.551 | 1 | 16.351 | 4.424 | 0.041 |
| Main effects | 27.035 | 2 | 13.517 | 3.613 | 0.035 |
| Groups | 27.035 | 2 | 13.517 | 3.613 | 0.035 |
| Explained | 43.585 | 3 | 14.528 | 3.884 | 0.015 |
| Residual | 175.827 | 47 | 3.741 | | |
| Total | 219.412 | 50 | 4.388 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.008 |

53 cases were processed.
2 cases (3.8%) were missing.

Table 3.37

MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST COMPREHENSIVENESS OF IDEAS AMONG THREE EXPERIMENTAL GROUPS

Grand mean = 5.18

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 0.88 | | | | 0.78 | |
| Burke | 17 | 0.00 | | | | 0.05 | |
| Tagmemic | 15 | -1.11 | | | | -1.04 | |
| | | | 0.39 | | | | 0.35 |
| Multiple R squared | | | | | | | .199 |
| Multiple R | | | | | | | .446 |

Table 3.38

ANALYSIS OF COVARIANCE FOR POSTTEST COMPREHENSIVENESS OF IDEAS AMONG THREE EXPERIMENTAL GROUPS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif of F |
|---|---|---|---|---|---|
| Covariates | 21.951 | 1 | 21.951 | 3.207 | 0.080 |
| SATV | 21.951 | 1 | 21.951 | 3.207 | 0.080 |
| Main effects | 18.267 | 2 | 9.134 | 1.334 | 0.273 |
| Groups | 18.267 | 2 | 9.134 | 1.334 | 0.273 |
| Explained | 40.219 | 3 | 13.406 | 1.959 | 0.133 |
| Residual | 321.703 | 47 | 6.845 | | |
| Total | 361.922 | 50 | 7.238 | | |

| Covari[illegible] | Raw regression coefficient |
|---|---|
| SATV | 0.009 |

53 cases were processed.
2 cases (3.8%) were missing.

Table 3.39

MULTIPLE CLASSIFICATION ANALYSIS FOR POSTTEST COMPREHENSIVENESS OF IDEAS AMONG THREE EXPERIMENTAL GROUPS

Grand mean = 9.04

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 0.91 | | | | 0.79 | |
| Burke | 17 | -0.51 | | | | -0.45 | |
| Tagmemic | 15 | -0.57 | | | | -0.49 | |
| | | | 0.26 | | | | 0.23 |

| | |
|---|---|
| Multiple R squared | .111 |
| Multiple R | .333 |

classification analysis in Table 3.39 confirmed that the experimental differences were decreasing.

Intellectual Processing. Regarding the evidence of intellectual processing in the pretest performances among the four groups, an analysis of covariance found no significant difference ($F=1.663$, $p=.186$; see Table 3.40). The multiple classification analysis (Table 3.41) illustrated the respective rankings: (1) Aristotle, (2) control, (3) Burke, and (4) tagmemics. The posttest results showed a significant difference among the four groups ($F=13.332$, $p=.000$; see Table 3.42). Interestingly, the multiple classification analysis showed a distinct improvement in the tagmemic treatment and, again, another adjusted deviation which favored all of the experimental groups over the control group (see Table 3.43).

The results of an analysis of covariance among the three experimental groups pretest performance were statistically significant ($F=3.451$, $p=.041$; see Table 3.44); the multiple classification analysis (Table 3.45) illustrated the tagmemic group fared poorly in comparison to the scores of the other two groups. In the posttest, however, an analysis of covariance could

Table 3.40

ANALYSIS OF COVARIANCE FOR PRETEST EVIDENCE OF INTELLECTUAL PROCESSING

| Source of variation | Sum of Squares | df | Mean Square | F | Signif of F |
|---|---|---|---|---|---|
| Covariates | 25.398 | 2 | 12.699 | 5.293 | 0.008 |
| SATV | 13.588 | 1 | 13.588 | 5.664 | 0.021 |
| ECT | 0.008 | 1 | 0.008 | 0.003 | 0.954 |
| Main effects | 11.966 | 3 | 3.989 | 1.663 | 0.186 |
| Groups | 11.966 | 3 | 3.989 | 1.663 | 0.186 |
| Explained | 37.364 | 5 | 7.473 | 3.115 | 0.015 |
| Residual | 131.948 | 55 | 2.399 | | |
| Total | 169.311 | 60 | 2.822 | | |

69 cases were processed.
9 cases (11.6%) were missing.

Table 3.41

MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST EVIDENCE OF INTELLECTUAL PROCESSING

Grand mean = 5.25

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 18 | 0.59 | | | | 0.52 | |
| Burke | 15 | -0.11 | | | | 0.03 | |
| Tagmemic | 14 | -0.89 | | | | -0.73 | |
| Control | 14 | 0.25 | | | | 0.03 | |
| | | | 0.33 | | | | 0.27 |
| Multiple R squared | | | | | | | .221 |
| Multiple R | | | | | | | .470 |

Table 3.42

ANALYSIS OF COVARIANCE FOR POSTTEST EVIDENCE OF INTELLECTUAL PROCESSING

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 5.924 | 2 | 2.962 | 0 708 | 0.497 |
| SATV | 0.067 | 1 | 0.067 | 0.016 | 0.899 |
| ECT | 2.643 | 1 | 2 643 | 0.632 | 0.430 |
| Main effects | 167.310 | 3 | 55 770 | 13 332 | 0.000 |
| Groups | 167.310 | 3 | 55.770 | 13.332 | 0.000 |
| Explained | 173.234 | 5 | 34.647 | 8.282 | 0.000 |
| Residual | 230.078 | 55 | 4.183 | | |
| Total | 403.311 | 60 | 6.722 | | |

69 cases were processed.
9 cases (11.6%) were missing.

Table 3.43

MULTIPLE CLASSIFICATION ANALYSIS FOR POSTTEST EVIDENCE OF INTELLECTUAL PROCESSING

Grand mean = 9.75

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 18 | 1.52 | | | | 1.46 | |
| Burke | 15 | -0.09 | | | | 0.12 | |
| Tagmemic | 14 | 0.75 | | | | 0.98 | |
| Control | 14 | -2.61 | | | | -2.99 | |
| | | | 0.60 | | | | 0.66 |
| Multiple R squared | | | | | | | .430 |
| Multiple R | | | | | | | .655 |

Table 3.44

ANALYSIS OF COVARIANCE FOR PRETEST EVIDENCE OF INTELLECTUAL PROCESSING AMONG THREE EXPERIMENTAL GROUPS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 26.900 | 1 | 26.900 | 10.742 | 0.002 |
| SATV | 26.900 | 1 | 26.900 | 10.742 | 0.002 |
| Main effects | 17.085 | 2 | 8.543 | 3.411 | 0.041 |
| Groups | 17.085 | 2 | 8.543 | 3.411 | 0.041 |
| Explained | 43.985 | 3 | 14.662 | 5.855 | 0.002 |
| Residual | 117.701 | 47 | 2.504 | | |
| Total | 161.686 | 50 | 3.234 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.010 |

53 cases were processed.
2 cases (3.8%) were missing.

Table 3.45

MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST EVIDENCE OF INTELLECTUAL PROCESSING AMONG THREE EXPERIMENTAL GROUPS

Grand mean = 5.25

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 0.64 | | | | 0.30 | |
| Burke | 17 | 0.16 | | | | 0.23 | |
| Tagmemic | 15 | -0.99 | | | | -0.89 | |
| | | | 0.38 | | | | 0.33 |
| Multiple R squared | | | | | | | .272 |
| Multiple R | | | | | | | .522 |

find no statistically significant difference among the groups ($F=.941$, $p=.397$; see Table 3.46). The Burke group declined though and the tagmemic group improved, so much so that their respective pretest positions were reversed (see Table 3.47). This particular finding will be explored in greater detail in the following chapter.

Holistic Evaluation of Quality. The general patterns already established were verified in the statistical analyses for "overall quality" of these lists of ideas: a significant posttest difference among the four groups and a gravitational tendency among the three experimental groups to reconcile statistical differences on the dependent posttest variable.

Specifically, an analysis of covariance showed no difference among the four groups on the overall quality of their pretest ($F=1.241$, $p=.304$; see Table 3.48). The multiple classification analysis (Table 3.49) revealed no surprises: the rankings being Aristotle, control, Burke, and tagmemics. The results of the posttest showed a significant difference among the four groups ($F=10.658$, $p=.000$; see Table 3.50). Like the other qualitative multiple classification analyses, this multiple classification analysis (Table

Table 3.46

ANALYSIS OF COVARIANCE FOR POSTTEST EVIDENCE OF INTELLECTUAL PROCESSING AMONG THREE EXPERIMENTAL GROUPS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 22.132 | 1 | 22.132 | 4.122 | 0.048 |
| SATV | 22.132 | 1 | 22.132 | 4.122 | 0.048 |
| Main effects | 10.107 | 2 | 5.053 | 0.941 | 0.397 |
| Groups | 10.107 | 2 | 5.053 | 0.941 | 0.397 |
| Explained | 32.239 | 3 | 10.746 | 2.001 | 0.127 |
| Residual | 252.388 | 47 | 5.370 | | |
| Total | 284.627 | 50 | 5.693 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.009 |

53 cases were processed.
2 cases (3.8%) were missing.

Table 3.47

MULTIPLE CLASSIFICATION ANALYSIS FOR POSTTEST EVIDENCE OF INTELLECTUAL PROCESSING AMONG THREE EXPERIMENTAL GROUPS

Grand mean = 9.78

| Variable + category | N | Unadjusted Dev'n | Unadjusted Eta | Adjusted for independents Dev'n | Adjusted for independents Beta | Adjusted for independents + covariates Dev'n | Adjusted for independents + covariates Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 0.58 | | | | 0.45 | |
| Burke | 17 | -0.67 | | | | -0.60 | |
| Tagmemic | 15 | 0.02 | | | | 0.11 | |
| | | | 0.22 | | | | 0.19 |

| | |
|---|---|
| Multiple R squared | .113 |
| Multiple R | .337 |

Table 3.48

ANALYSIS OF COVARIANCE FOR PRETEST OVERALL QUALITY OF IDEAS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 15.060 | 2 | 7.530 | 2.414 | 0.099 |
| SATV | 4.017 | 1 | 4.017 | 1.288 | 0.261 |
| ECT | 1.277 | 1 | 1.277 | 0.409 | 0.525 |
| Main effects | 11.616 | 3 | 3.872 | 1.241 | 0.304 |
| Groups | 11.616 | 3 | 3.872 | 1.241 | 0.304 |
| Explained | 26.676 | 5 | 5.335 | 1.710 | 0.148 |
| Residual | 171.553 | 55 | 3.119 | | |
| Total | 198.230 | 60 | 3.304 | | |

69 cases were processed.
8 cases (11.6%) were missing.

Table 3.49

MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST OVERALL QUALITY OF IDEAS

Grand mean = 4.79

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 18 | 0.71 | | | | 0.66 | |
| Burke | 15 | -0.39 | | | | -0.26 | |
| Tagmemic | 14 | -0.57 | | | | -0.43 | |
| Control | 14 | 0.07 | | | | -0.14 | |
| | | | 0.28 | | | | 0.24 |
| Multiple R squared | | | | | | | .135 |
| Multiple R | | | | | | | .367 |

3.51) saw the total burden of the adjusted negative deviation fall into the control group's domain.

Among the three experimental groups, the analysis of covariance on the pretest measure for overall quality reported no significant difference ($F=2.110$, $p=.133$; see Table 3.52), and the multiple classification analysis (Table 3.53) echoed the previous pretest rankings: Aristotle, Burke, and tagmemics. The analysis of covariance on the posttest revealed even less significant differences among the three groups ($F=1.426$, $p=.251$; see Table 3.54). Also, the multiple classification analysis (Table 3.55) again revealed the tendency for the Burke group to decline and the tagmemic group to improve while the Aristotle group remained steadily at the top.

Results of Hypothesis Nine--Composition Plan Quality

None of the statistical tests comparing the quality of the composition plans among the four groups was statistically significant. The general pattern revealed that the Aristotle group ranked first, the control group ranked second; the tagmemic group ranked third, and the Burke group ranked fourth, though some interesting rank switching occasionally occurred.

Table 3.50

ANALYSIS OF COVARIANCE FOR POSTTEST OVERALL QUALITY OF IDEAS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 8.746 | 2 | 4.373 | 0.851 | 0.433 |
| SATV | 0.163 | 1 | 0.163 | 0.032 | 0.859 |
| ECT | 3.642 | 1 | 3.642 | 0.708 | 0.404 |
| Main effects | 164.352 | 3 | 54.784 | 10.658 | 0.000 |
| Groups | 164.352 | 3 | 54.784 | 10.658 | 0.000 |
| Explained | 173.098 | 5 | 34.620 | 6.735 | 0.000 |
| Residual | 282.705 | 55 | 5.140 | | |
| Total | 455.803 | 60 | 7.597 | | |

69 cases were processed.
8 cases (11.6%) were missing.

Table 3.51

MULTIPLE CLASSIFICATION ANALYSIS FOR POSTTEST OVERALL QUALITY OF IDEAS

Grand mean = 8.26

| Variable + category | N | Unadjusted Dev'n | Unadjusted Eta | Adjusted for independents Dev'n | Adjusted for independents Beta | Adjusted for independents + covariates Dev'n | Adjusted for independents + covariates Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 18 | 1.74 | | | | 1.68 | |
| Burke | 15 | -0.20 | | | | 0.02 | |
| Tagmemic | 14 | 0.45 | | | | 0.69 | |
| Control | 14 | -2.48 | | | | -2.87 | |
| | | | 0.56 | | | | 0.61 |
| Multiple R squared | | | | | | | .380 |
| Multiple R | | | | | | | .616 |

Table 3.52

ANALYSIS OF COVARIANCE FOR PRETEST OVERALL QUALITY OF IDEAS AMONG THREE EXPERIMENTAL GROUPS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 22.497 | 1 | 22.497 | 8.335 | 0.006 |
| SATV | 22.497 | 1 | 22.497 | 8.335 | 0.006 |
| Main effects | 11.390 | 2 | 5.695 | 2.110 | 0.133 |
| Groups | 11.390 | 2 | 5.695 | 2.110 | 0.133 |
| Explained | 33.887 | 3 | 11.296 | 4.185 | 0.010 |
| Residual | 126.858 | 47 | 2.699 | | |
| Total | 160.745 | 50 | 3.215 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.009 |

53 cases were processed.
2 cases (3.8%) were missing.

Table 3.53

MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST OVERALL QUALITY OF IDEAS AMONG THREE EXPERIMENTAL GROUPS

Grand mean = 4.84

| Variable + category | N | Unadjusted Dev'n | Unadjusted Eta | Adjusted for independents Dev'n | Adjusted for independents Beta | Adjusted for independents + covariates Dev'n | Adjusted for independents + covariates Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 0.68 | | | | 0.56 | |
| Burke | 17 | -0.14 | | | | -0.08 | |
| Tagmemic | 15 | -0.71 | | | | -0.62 | |
| | | | 0.32 | | | | 0.27 |
| Multiple R squared | | | | | | | .211 |
| Multiple R | | | | | | | .459 |

Table 3.54

ANALYSIS OF COVARIANCE FOR POSTTEST OVERALL QUALITY OF IDEAS AMONG THREE EXPERIMENTAL GROUPS

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 21.591 | 1 | 21.591 | 3.281 | 0.076 |
| SATV | 21.591 | 1 | 21.591 | 3.281 | 0.076 |
| Main effects | 18.764 | 2 | 9.382 | 1.426 | 0.251 |
| Groups | 18.764 | 2 | 9.382 | 1.426 | 0.251 |
| Explained | 40.356 | 3 | 13.452 | 2.044 | 0.121 |
| Residual | 309.330 | 47 | 6.581 | | |
| Total | 349.686 | 50 | 6.994 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.009 |

53 cases were processed.
2 cases (3.8%) were missing.

Table 3.55

MULTIPLE CLASSIFICATION ANALYSIS FOR POSTTEST OVERALL QUALITY OF IDEAS AMONG THREE EXPERIMENTAL GROUPS

Grand mean = 9.25

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 0.85 | | | | 0.73 | |
| Burke | 17 | -0.78 | | | | -0.73 | |
| Tagmemic | 15 | -0.19 | | | | -0.10 | |
| | | | 0.27 | | | | 0.23 |
| Multiple R squared | | | | | | | .115 |
| Multiple R | | | | | | | .340 |

Consequently, the gains experienced by the three heuristic groups in quantity and quality of "raw material" did not significantly carry over to the "arrangement" phase of the prewriting process.

Insightfulness. Table 3.56 shows that there was no significant difference among the four groups' composition plans, the criteria being the plans' "insightfulness" ($F=.846$, $p=.474$). The multiple classification analysis, however, illustrated that there was a tendency for the plans of the Aristotle and the tagmemic group to be more "factual" and "insightful" (see Table 3.57). Also, there was almost no difference between the adjusted deviations between the Burke group and the control group.

Comprehensiveness. The results of an analysis of covariance on the "comprehensiveness of the composition plan" found no statistically significant difference among the groups ($F=1.800$, $p=.156$; see Table 3.58). Table 3.59 shows the respective rankings obtained from the multiple classification analysis; interestingly, the performance of the control group was judged higher than both the Burke and the tagmemic groups--heuristics known for their comprehensiveness.

Table 3 56

ANALYSIS OF COVARIANCE FOR INSIGHTFULNESS OF COMPOSITION PLAN

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 5.409 | 1 | 5.409 | 0.918 | 0.342 |
| SATV | 5.409 | 1 | 5.409 | 0.918 | 0.342 |
| Main effects | 14.958 | 3 | 4.986 | 0.846 | 0.474 |
| Groups | 14.958 | 3 | 4.986 | 0.846 | 0.474 |
| Explained | 20.367 | 4 | 5.092 | 0.864 | 0.491 |
| Residual | 365.304 | 62 | 5.892 | | |
| Total | 385.672 | 66 | 5.844 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.004 |

69 cases were processed.
2 cases (2.9%) were missing.

Table 3.57

MULTIPLE CLASSIFICATION ANALYSIS FOR INSIGHTFULNESS OF COMPOSITION PLAN

Grand mean = 6.37

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 0.37 | | | | 0.34 | |
| Burke | 17 | -0.55 | | | | -0.50 | |
| Tagmemic | 15 | 0.29 | | | | 0.36 | |
| Control | 16 | -0.37 | | | | -0.45 | |
| | | | 0.20 | | | | 0.20 |
| Multiple R squared | | | | | | | .053 |
| Multiple R | | | | | | | .230 |

Perhaps "invention" comprehensiveness differs more than many of us believe from "arrangement" comprehensiveness, but more of this in the next chapter.

Maturity. As reported on Table 3.60, there was no significant difference among the four groups with respect to the maturity of their composition plans ($F=.822$, $p=.487$). Table 3.61 reports the results of the multiple classification analysis in which the unadjusted deviation shows that the Aristotle group was entirely responsible for the positive deviation. As previously mentioned, however, the judges' lowest interrater reliability occurred in this category.

Suitable Arrangement. The results of an analysis of covariance here were probably the most surprising, though there was no statistically significant difference among the groups ($F=2.354$, $p=.081$; see Table 3.62). The control group, as reported in the multiple classification analysis on Table 3.63, ranked first, well above, but not statistically far enough above, the experimental groups. This finding anticipates one of the dangers of stimulating invention in the freshman setting--"rhetorical overload." This was the single category in which the control group's rank bettered the performances of the experimental groups.

Table 3.58

ANALYSIS OF COVARIANCE FOR COMPREHENSIVENESS OF COMPOSITION PLAN

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 9.354 | 1 | 9.354 | 1.462 | 0.231 |
| SATV | 9.354 | 1 | 9.354 | 1.462 | 0.231 |
| Main effects | 34.554 | 3 | 11.518 | 1.800 | 0.156 |
| Groups | 34.554 | 3 | 11.518 | 1.800 | 0.156 |
| Explained | 43.908 | 4 | 10.977 | 1.716 | 0.158 |
| Residual | 396.659 | 62 | 6.398 | | |
| Total | 440.567 | 66 | 6.675 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.005 |

69 cases were processed.
2 cases (2.9%) were missing.

Table 3.59

MULTIPLE CLASSIFICATION ANALYSIS FOR COMPREHENSIVENESS OF COMPOSITION PLAN

Grand mean = 6.55

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 1.03 | | | | 1.00 | |
| Burke | 17 | -0.96 | | | | -0.91 | |
| Tagmemic | 15 | -0.42 | | | | -0.36 | |
| Control | 16 | 0.20 | | | | 0.12 | |
| | | | 0.30 | | | | 0.28 |

| | |
|---|---|
| Multiple R squared | .100 |
| Multiple R | .316 |

Table 3.60

ANALYSIS OF COVARIANCE FOR MATURITY OF COMPOSITION PLAN

| Source of variation | Sum of Squares | df | Mean Square | F | Signif of F |
|---|---|---|---|---|---|
| Covariates | 9.146 | 1 | 9.146 | 1.704 | 0.197 |
| SATV | 9.146 | 1 | 9.146 | 1.704 | 0.197 |
| Main effects | 13.232 | 3 | 4.411 | 0.822 | 0.487 |
| Groups | 13.232 | 3 | 4.411 | 0.822 | 0.487 |
| Explained | 22.378 | 4 | 5.594 | 1.042 | 0.393 |
| Residual | 332.786 | 62 | 5.368 | | |
| Total | 355.164 | 66 | 5.381 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.005 |

69 cases were processed.
2 cases (2.9%) were missing.

Table 3.61

MULTIPLE CLASSIFICATION ANALYSIS FOR MATURITY OF COMPOSITION PLAN

Grand mean = 6.27

| Variable + category | N | Unadjusted Dev'n | Eta | Adjusted for independents Dev'n | Beta | Adjusted for independents + covariates Dev'n | Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 0.68 | | | | 0.64 | |
| Burke | 17 | -0.50 | | | | -0.44 | |
| Tagmemic | 15 | -0.00 | | | | 0.08 | |
| Control | 18 | -0.27 | | | | -0.36 | |
| | | | 0.20 | | | | 0.19 |

| | |
|---|---|
| Multiple R squared | .063 |
| Multiple R | .251 |

Table 3.62

ANALYSIS OF COVARIANCE FOR SUITABLE ARRANGEMENT OF COMPOSITION PLAN

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 7.701 | 1 | 7.701 | 1.138 | 0.290 |
| SATV | 7.701 | 1 | 7.701 | 1.138 | 0.290 |
| Main effects | 47.797 | 3 | 15.932 | 2.354 | 0.081 |
| Groups | 47.797 | 3 | 15.932 | 2.354 | 0.081 |
| Explained | 55.498 | 4 | 13.875 | 2.050 | 0.098 |
| Residual | 419.696 | 62 | 6.769 | | |
| Total | 475.194 | 66 | 7.200 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.004 |

69 cases were processed.
2 cases (2.9%) were missing.

Table 3.63

MULTIPLE CLASSIFICATION ANALYSIS FOR SUITABLE ARRANGEMENT OF COMPOSITION PLAN

Grand mean = 6.16

| Variable + category | N | Unadjusted Dev'n | Unadjusted Eta | Adjusted for independents Dev'n | Adjusted for independents Beta | Adjusted for independents + covariates Dev'n | Adjusted for independents + covariates Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 0.41 | | | | 0.39 | |
| Burke | 17 | -1.16 | | | | -1.13 | |
| Tagmemic | 15 | -0.50 | | | | -0.46 | |
| Control | 16 | 1.21 | | | | 1.16 | |
| | | | 0.34 | | | | 0.32 |
| Multiple R squared | | | | | | | .117 |
| Multiple R | | | | | | | .342 |

Helpfulness. Table 3.64 reports the results of the analysis of covariance for "helpfulness" in which, again, there were no significant differences among the four groups (F=1.962, p=.129). The multiple classification analysis (Table 3.65) reported the following rankings: (1) Aristotle, (2) control, (3) tagmemics, and (4) Burke.

Overall Impression. There was not a statistically significant difference among the groups with respect to the judges' overall qualitative impressions of the composition plans (F=1.215, p=.312; see Table 3.66). Table 3.67 reported that the composition plans written by the Aristotle group were slightly better than the control group's, but the composition plans written by the control group were slightly better than those written by the tagmemic group and the Burke group--though no differences which could not have been accounted for by chance about thirty percent of the time.

Table 3.64

ANALYSIS OF COVARIANCE FOR HELPFULNESS OF COMPOSITION PLAN

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 0.596 | 1 | 0.596 | 0.106 | 0.746 |
| SATV | 0.596 | 1 | 0.596 | 0.106 | 0.746 |
| Main effects | 33.234 | 3 | 11.078 | 1.962 | 0.129 |
| Groups | 33.234 | 3 | 11.078 | 1.962 | 0.129 |
| Explained | 33.830 | 4 | 8.458 | 1.498 | 0.214 |
| Residual | 350.080 | 62 | 5.646 | | |
| Total | 383.910 | 66 | 5.817 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.001 |

69 cases were processed.
2 cases (2.9%) were missing.

Table 3.65

MULTIPLE CLASSIFICATION ANALYSIS FOR HELPFULNESS OF COMPOSITION PLAN

Grand mean = 6.39

| Variable + category | N | Unadjusted Dev'n | Unadjusted Eta | Adjusted for independents Dev'n | Adjusted for independents Beta | Adjusted for independents + covariates Dev'n | Adjusted for independents + covariates Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 0.93 | | | | 0.93 | |
| Burke | 17 | -0.92 | | | | -0.92 | |
| Tagmemic | 15 | -0.39 | | | | -0.39 | |
| Control | 16 | 0.24 | | | | 0.24 | |
| | | | 0.30 | | | | 0.30 |
| Multiple R squared | | | | | | | .088 |
| Multiple R | | | | | | | .297 |

Table 3.66

ANALYSIS OF COVARIANCE FOR OVERALL IMPRESSION
OF COMPOSITION PLAN

| Source of variation | Sum of Squares | df | Mean Square | F | Signif. of F |
|---|---|---|---|---|---|
| Covariates | 4.312 | 1 | 4.312 | 0.741 | 0.393 |
| SATV | 4.312 | 1 | 4.312 | 0.741 | 0.393 |
| Main effects | 21.218 | 3 | 7.073 | 1.215 | 0.312 |
| Groups | 21.218 | 3 | 7.073 | 1.215 | 0.312 |
| Explained | 25.530 | 4 | 6.383 | 1.097 | 0.366 |
| Residual | 360.888 | 62 | 5.821 | | |
| Total | 386.418 | 66 | 5.855 | | |

| Covariate | Raw regression coefficient |
|---|---|
| SATV | 0.003 |

69 cases were processed.
2 cases (2.9%) were missing.

Table 3.67

MULTIPLE CLASSIFICATION ANALYSIS FOR OVERALL IMPRESSION
OF COMPOSITION PLAN

Grand mean = 6.31

| Variable + category | N | Unadjusted Dev'n | Unadjusted Eta | Adjusted for independents Dev'n | Adjusted for independents Beta | Adjusted for independents + covariates Dev'n | Adjusted for independents + covariates Beta |
|---|---|---|---|---|---|---|---|
| Groups | | | | | | | |
| Aristotle | 19 | 0.74 | | | | 0.72 | |
| Burke | 17 | -0.84 | | | | -0.81 | |
| Tagmemic | 15 | -0.18 | | | | -0.14 | |
| Control | 16 | 0.19 | | | | 0.14 | |
| | | | 0.25 | | | | 0.24 |

| | |
|---|---|
| Multiple R squared | .066 |
| Multiple R | .257 |

Results of Hypothesis Ten--Significant Correlations The Pearson product-moment correlation coefficient test was run to determine whether there were significant relationships between dependent measures. For the most part, positive correlations were found crossing the SAT verbal score, the previous semester's English grade, and the student's high school rank with the quantitative results, the insightfulness findings, and the overall quality results. These positive correlations were not statistically significant; Appendix G presents the data chart. The ECT score, however, accounted for some interesting negative correlations, one of which was statistically significant. More specifically, the ECT score was negatively correlated with the pretest and posttest scores on "insightfulness," the posttest score on the overall quality of the ideas, and significantly (S=.022) negatively correlated with the quantitative posttest.

Summary of Results by Hypothesis

H1: The students who inquired into their research paper topics at the computer terminal reported that the experience was fruitful. A majority reported that generally more students need help prewriting. There was also strong agreement that these CAI units made them think and that heuristic strategies can be applied to a number of topics. The participants--both students and teachers--felt that CAI invention supplemented and often stimulated the prewriting process.

H2: The CAI modules worked, and the students worked at them. Only one student out of fifty-three did not complete the thirty-minute posttest. These findings were much higher than predicted. The lack of "content" information did not stop the students from continuing an exploration of their various topics. That the CAI units handled so many topics without boring the students will be a definite pedagogical advantage.

H3: The CAI modules were quite good at eliciting an answer to the first presentation of any question regardless of the heuristic method. A significant difference was found concerning how well the students elaborated on their first response: the Burke method being the least likely to sustain the inquiry.

The possible heuristic implications will be discussed in the following chapter.

H4: Individual quantitative gains were made in all experimental groups; the individuals in the control group experienced an overall decrease in the number of ideas. The CAI modules effectively encourage quantity. The trend analysis favors the Burke pentad for sheer quantity of information. The student readily identified the act, scene, agent, agency, and purpose of their subjects. These modules certainly stimulated the efficiency of the gathering process, much more so than students in the control group could stimulate their own invention processes.

H5: Individual qualitative gains were made in [illegible] groups, although the control group only reached [illegible] significance in the "insightfulness" [illegible] Allowing more time for invention does [illegible] aspects of the quality of the ideas. The [illegible] particularly effective for encouraging [illegible] more comprehensive in their

H6: All of the students internalized the heuristic well-enough to be able to write a list of that strategy's questions. No statistical difference was found among the experimental groups. In the next chapter, this finding will be elaborated on. Basically, the test for internalization is limited for it could not tell whether the student was now using the heuristic or merely remembering and applying the heuristic for this particular assignment.

H7: As far as quantitative differences among the four groups were concerned, they all favored the experimental groups. No statistically significant differences were noted among the three experimental groups; in fact, the CAI treatment actually made these groups more alike.

H8: The qualitative differences also favored the experimental groups in the areas of (1) factuality, surprise value, insightfulness, (2) comprehensiveness, (3) evidence of intellectual processing, and (4) overall impression. Among the experimental groups, they became more alike. Instead of differences, we found a heuristic convergence at work.

H9: None of the statistical procedures comparing the quality of the composition plans among the four groups was statistically significant. There was little carry-over to the "arrangement" phase in terms of the qualitative gains accumulated by the experimental groups in the treatment.

H10: No significant correlations were discovered, except for an intriguing negative correlation between ECT and posttest quantity of ideas.

# CHAPTER 4

## Conclusions, Recommendations, and Implications

Writers commonly have rituals for beginning which stimulate thinking, order memory, and encourage production. The more systematic these rites of invention are, the more efficient the inquiry will be in terms of the quantity and quality of ideas. At least, that assumption was crucial for this study, and, to a large extent, that assumption has remained valid. In order to simulate such a uniform, systematic inquiry, an invention instructional system was conceived, designed, and developed to be compatible with "state-of-the-art" computer-assisted instruction. Stimulating invention through computer-assisted instruction, however, introduced a number of new "felt difficulties"--some

rhetorical, some methodological, and some pedagogical. This chapter contains more by way of beginnings than conclusions, but such a position can be philosophically advantageous, for, as Edward W. Said writes in Beginnings: Intention and Method (1978), "A beginning, therefore, is a problem to be studied, as well as a position taken by any writer" (p. 13). In other words, there are still problems to find and problems to solve. Said's dichotomy for "beginnings"--problems to study and positions taken by writers--frames the major themes in this chapter: rhetorical problems in stimulating invention and rhetorical styles of writers in the invention stage; methodological problems evaluating heuristic strategies in operation and descriptive reactions to the method; and pedagogical problems in teaching invention by CAI and the consequent reactions students and teachers have toward CAI-prompted invention.

Before elaborating about these rhetorical, methodological, and pedagogical conclusions or recommending implications for further research, perhaps it would be wise to summarize the study thus far.

The impulse for this research was to combine the renewed interest in teaching the first rhetorical art, inventio--the systematic process of exploring a subject in order to discover new insights and persuasive arguments, or recover ideas, facts, and opinions from memory--with the developing technology of instructional computing.

The primary developmental findings were that CAI which encouraged both growth in the number and the sophistication of ideas could be programmed, that questioning dialogues could help students articulate, refine, and preserve their ideas and moreover, that such questioning dialogues could ignore content in favor of perspective and still help students begin writing; and finally, that theories of creativity based on intersecting content and perspective were programmable today and were certain to be even more programmable in the future.

More specifically, the continuing development of generative CAI--systems which can interact responsively and responsibly in what Loraine T. Sinnott (1976) calls "less predictable modes of CAI, like problem solving or computer simulations" (p. 1)--is inevitable. Although these invention programs incorporated a limited semantic understanding, they followed a current developmental

trend for programs to emulate the verbal behavior of intelligent, personal, inquisitive human tutors. The success and perhaps innovation of these programs is that they represent the first attempt to have an "open" instructional system--i.e., a computer-based package which does not have an associated body of content from which to draw appropriate answers. In this regard, the programs differ from Goldberg's (1973) logic teaching, Wittig's (1977) DIALOGUE modules, the Brown and Burton (1975) SOPHIE tutoring in electronic troubleshooting, and the Collins and Warnock (1974) GEO-SCHOLAR inquiries about South American geography.

The first of two important research findings was that such a systematic inquiry using either Aristotle's twenty-eight enthymeme topoi, Kenneth Burke's dramatistic pentad, or the tagmemic matrix of Richard Young, Alton Becker, and Kenneth Pike made three experimental groups more alike with respect to the quantity and quality of their ideas. Additionally, these three experimental groups differed significantly from a control group with respect to the number of ideas generated, the insightfulness and factuality of the ideas, the comprehensiveness of those ideas, the surface-cued intellectual processing evident in the

sample writings, as well as the overall quality of the inquiry.

The second important finding was that computer-administered, posttest methodology represented a more stringent way for controlling and perhaps later replicating quasi-experimental research in rhetoric. The most beneficial consequence of this study may be the introduction of the computer as a way to increase the reliability and the validity of what researchers in the humanities and researchers in humanities education actually research. Admittedly, the fear and trembling Ellen Nold reported in 1975 still exists, but, if empirical research in rhetoric and English education is to gain any credibility, then the profession must have confidence in the researcher's methodology.

## Rhetorical Recommendations and Implications

First among the rhetorical recommendations, of course, is to continue empirical investigations regarding heuristic strategies. And not only those popular comprehensive systems which were compared in this research: the profession needs much more evidence that indeed teaching invention eventually helps writers write.

The next major dilemma in invention research is this one: how does a researcher empirically compare heuristic strategies when those strategies inherently tend to make all groups more alike? Only once in this research was there a significant difference among the three experimental groups--that difference concerning the elaboration rates or ease with which the members of the group continued answering a question. Here, the topoi method was the most likely to sustain an inquiry and the Burke method was the least likely to sustain the inquiry. What confounds this finding, however, is that the Burke pentad stimulated more "propositions" on an average.

The point, though, is this: as any heuristically guided inquiry proceeds from its original premises, the inquiry expands to comprehend more and more reality, more and more perspectives. This heuristic expansion resembles the proverbial pebble-in-the-pond. In terms of the three heuristic methods in this research, a Burke "act" quickly overlaps the dynamic, wave point of view, which in turn overlaps considerations of time--the fifth enthymeme topic. The ninth topic--logical division--assumes the field perspective and a classification mode, perhaps a classification by some criterion, e.g., "agencies."

Aristotle's incentives and deterrents are swift avenues for sorting out "static" features of purpose. If a creative, comprehensive inquiry happens, then heuristic-combining naturally occurs. With this osmotic tendency for one heuristic to converge and assimilate another heuristic perspective noted, some comments about the respective group performances can be cautiously introduced.

That the Aristotle treatment fared well throughout the study may be partially due to the nature of the research paper assignment. The research paper assignment given to the Burke class was this: "Your thesis will be that the persuasive techniques used in the coverage of your topic, both pro and con, are either ethical or unethical; the support for the assertion will come from your research on the aspect of a specific controversial issue." The persuasive aim was emphasized in the particular course from which the subjects were selected. Nevertheless, the insights, comprehensiveness, and intellectual processing evident in the Aristotle group's papers must be based upon more than the nature of the assignment.

The enthymeme as a basis for inquiry is amazingly strong for discovering the inherent dissonance in a subject. Composing the question pool for the topoi module was relatively easy because Aristotle had provided twenty-eight plus explicit predicates, predicates which immediately interact with a body of content.

Although the Aristotle heuristic often is criticized for not being portable--who can name all twenty-eight of the formal topics?--many cues or keywords were easily remembered by the students and easily recognized by the evaluators. The results of the internalization exercise were consequently revealing. Specifically, the students remembered many of the keywords: opposites, consequences, causes, effects, definitions, contradictions, connotations, special experiences, paradoxes, better ways, parts, wholes. . . . Also, the evaluators were able to recognize these enthymeme-based questions with less difficulty.

Having over twenty-eight predicates may also be a reason why the Aristotle treatment prompted the highest elaboration rate. Since the CAI presentation continually asked students to give more information, perhaps it was easier to extend their answers to the topics than it was to extend their answers to Burke's five essential perspectives or to the three categories of particle, wave, and field.

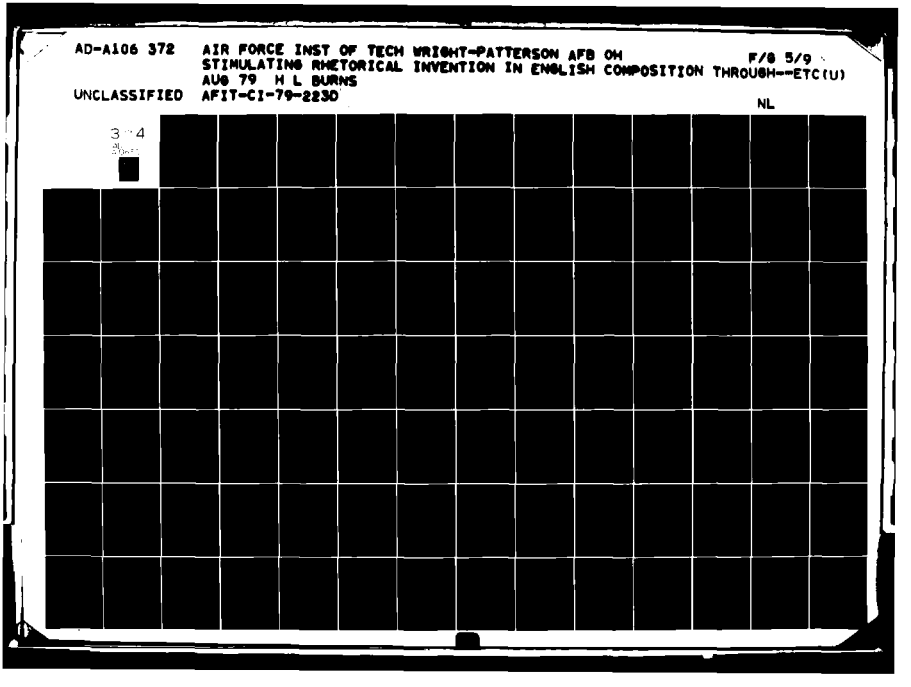
Implications derived from the empirical data of the Burke group's performance are two-edged. The trend showed excellent quantity increases though significantly less *elaboration and* respectively lower qualitative interaction. Why?

The godterm in Kenneth Burke's dramatistic scheme is "identification." Therefore, the first task of an inquirer using the Burke pentad is to identify the act, scene, agent, agency, and purpose. Any complete exploration, or as Burke writes, "any complete statement about motives will offer <u>some kind of</u> answers to these five questions. . . ." Dramatistically, a writer invents by identifying and later by exploring the ratios among the perspectives. The potential for interaction, in this research at least, was limited with this heuristic. Its quantitative gains may have been achieved because it is not as difficult to describe a scene, an action, a

person, a tool, or a reason as it is to describe the interactions among these variables. Also, "identification" answers tended to be longer first responses and, thirty-one percent of the time, did not stimulate further elaboration. Yet such a finding may be more the direct result of the CAI modules than a result of the heuristic itself. Not that the ratios are ignored, they are not; but the ratio questions are asked in the module only after the first five questions have been answered. Overall the post hoc analysis revealed more identification questions than legitimate "ratio" questions. Improving the Burke program means sacrificing "identification" and emphasizing the ratios and the dialectic. Such a change, however, would be likely to produce a decrease in the number of propositions a student writes. In sum, the vital interaction was delayed, and the overall quality of the Burke performances suffered. At least, the insights and the intellectual processing may have suffered as a result of the delayed presentation of the ratio questions.

What the internalization performance of the Burke heuristic illustrated was interesting and, again, revealing. The "5-W" cues helped the students write a few questions, but after those were asked, some students contaminated their questions and, therefore, puzzled the evaluators as to which of the three heuristics they were using in the exercise. These implications obviously need further testing. Nevertheless, this research strongly indicates that the sophistication of the Burke system is in the manipulation of the ratios and in the subsequent dialectic.

Frankly, the performances of the tagmemic experimental group were the most varied. The correlation statistics on individual quantitative gains between the pretest and the posttest were negative: -.401. Also, the correlation statistics on individual qualitative gains between the pretest and the posttest measures within this experimental group were negative: -.454 on factuality, -.[illegible] insightfulness; -.4.04 on [illegible] evidence of intellectual [illegible] overall quality. Simply stated, [illegible] and unanticipated amounts [illegible] pretest and the posttest [illegible] group. The data [illegible]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determine where in the sample this rank switching occurred.

The tagmemic group performance, like the other two heuristic treatments, far outdistanced the control group. The trends, as revealed in the multiple classification analyses, were that the tagmemic group generally improved in insightfulness, intellectual processing, and in overall quality among the three treatment groups; in comprehensiveness, they remained in their same relative positions. Young's and Odell's insistence regarding the intellectual processing in the tagmemic approach is well-founded according to the findings in this study. On the pretest for intellectual processing, the tagmemic performance, after the adjusted covariate deviation, showed this group was completely responsible for the negative deviation. Their improvement on the posttest was as large a "growth" by any one group in the entire study. Although they did not quite overtake the performance of the Aristotle group, they came close. What this performance verifies is how quickly the tagmemic heuristic encourages creative, intellectual interaction.

The practical internalization of the tagmemic heuristic may be more difficult than is commonly supposed, although this implication needs more research and analysis. Like the Burke heuristic, the particle-wave-field approach (admittedly not the complete heuristic) offers only a few "starting places." Consequently, the students had some difficulty creating their own questions from the perspectives of particle, wave, and field. After students asked what a subject is, how it changes, and how it fits into a larger system, some of them tended to leave these perspectives in favor of other questions, questions not as easily recognized as "tagmemically inspired." Because the language and method of tagmemic thinking seemed the most unfamiliar, the students may have needed more of an introduction. But the counterargument is simply that all the lectures and practice sessions were controlled among the groups to see how performances would differ.

During the past decade, a substantial amount of interest has focused on the process of invention. All of the research calls for more research, and this study will not be an exception. The basic rhetorical strategy in invention involves gathering ideas and arguments, memories and beliefs, facts and, even, distortions of

truth. A heuristic method's effectiveness, therefore, can be measured by determining how well it gathers. The next step, arrangement, involves another verbal calculus--a new set of procedures which offer a writer strategies for sorting and selecting the most appropriate ideas and arguments, memories and. . . . This study hoped to uncover which heuristic strategy best foreshadowed arrangement; it found no overwhelming evidence favoring one treatment over another. The composition plan exercise in this research failed to demonstrate any significant transition from the gathering of ideas to the arranging of those ideas. While the dilemma here may be partly pedagogical, the rhetorical dilemma remains: what invention strategies most help a writer gather ideas and foreshadow arrangement? What criteria determine the organizational effectiveness of a heuristic strategy?

Each of the three heuristics explored in this research has its own characteristic problems and areas of greatest effectiveness. As this study illustrated, a given subject can be explored in language appropriate to all three of these approaches. Recognizing the dangers of overgeneralizing from "trends" in this research, this initial comparative study nevertheless opens the door to further investigation. As Richard Young (1978) writes:

> There is no algorithm, no systematic decision-making procedure, that can dictate the choice of one theory rather than another. Informed choice will depend upon informed debate, and this requires that we be clear about our criteria for judgment, that we agree on the meaning of our terms, that we have evidence to support claims about the adequacy of one or another of the theories--the process is familiar to us all. If we are to carry it out responsibly, much research needs to be done. (p. 47)

## Methodological Recommendations and Implications

The justification of such research as this depends on the relevancy of the problem, the reasonableness of the hypotheses, and the purity of the methodology. The computer was able to contain a number of contaminates, but as the study progressed, some of the limitations became visible.

First, since something must happen in a control group, does not the use of a control group increase the probability of error? Precisely accounting for teacher variability and course variability under the current research practices for the protection and privacy of human subjects is difficult, for how can a "true" control baseline be achieved. Ironically, the control group was the most difficult to account for since there was no method of accurately knowing or describing what heuristic procedures they were using. A descriptive

study defining heuristic strategies of freshman composition students is sorely needed.

Analysis of covariance, while perhaps the best statistical measure available for analyzing differences among non-random groups, must be carefully scrutinized for the reliability of the dependent variables. What should be the covariable in further studies of invention? One appropriate design for a follow-up experiment would be to have the sample subjects take one or two cognitive ability tests, perhaps tests selected from the Kit of Reference Tests for Cognitive Factors (French, Ekstrom, and Price, 1963), and, using their cognitive scores as a covariable, describe the results.

Two other limitations should be mentioned. The study did not account for the typing skills within the experimental groups or for the writing speed of the control group. If anything, the lack of typing ability would have favored the control group's relative position. Also, the test for internalization is actually a test of the "mid"-term memory and a representation of a skill elicited by command; it is not a test of what heuristic strategy the student would now actually use to write. The control group was not asked to generate ten questions since they were not taught a specific heuristic. Still, it might have been a most

interesting challenge for the evaluators to sort out the exercises as well as an important collection of "natural" heuristic methods.

This much honesty betrays the rhetorician, though not the Platonic rhetorician. I am concerned with this matter of methodological soul. Remember Plato's contempt for some of his contemporaries in the Phaedrus: "Our contemporaries--you've heard of them--who write handbooks on rhetoric are crafty fellows that keep to themselves this matter of soul, though they know it perfectly well" (p. 63).

The strengths of the methodology concern the handling of the experimental groups, the data-gathering facilities for the posttest, the masked evaluation of the data, and the intensive statistical analysis. All of these strengths are vital to a disciplined empirical inquiry. What may be even more critical is that the practice treatments and posttest modules can be replicated, and that the trends noted here in the initial experiment may either be verified or not.

To summarize, pretest-posttest research designs with control groups are susceptible to contamination from their placebo treatment and from their compliance with federal regulations legitimately protecting human subjects. Using single treatments and posttests, controlling the topic, matching pairs by both cognitive style and verbal abilities, and evaluating both the posttest and the written theme would guarantee greater purity in empirically describing and evaluating invention.

## Pedagogical Recommendations and Implications

"The purpose of thinking," Edward deBono (1970) writes, "is not to be right but to be effective." He elaborates:

> Being effective does eventually involve being right but there is a very important difference between the two. Being right means being right all the time. Being effective means being right only at the end."

The ultimate aim, then, for teaching invention with systematic heuristic procedures is intellectual effectiveness. What must be grappled with pedagogically is (1) whether or not these CAI modules stimulate invention as well as (or better than) current

instruction in invention, or (2) whether they effectively supplement current invention instruction. A questionnaire of college English teachers at the 1977 Conference on College Composition and Communication found that relatively few class periods are exclusively devoted to the teaching of specific invention strategies. Therefore, stimulating invention in English composition through computer-assisted instruction is (1) possible, (2) quantitatively effective, (3) qualitatively effective, and (4) individualized. Stimulating ideas via CAI is not (1) madness, (2) terribly costly, (3) boring, or (4) a passing fad. This study contributes some evidence that three heuristic strategies via CAI are better than what little individualized invention actually occurs in the composition classroom, at least as far as quantity, comprehensiveness, intellectual processing, and overall quality of ideas are concerned. To stimulate invention effectively means that it must be a one-on-one affair. Classroom lectures and general heuristic discussions, this research indicates, do not reach the heart of the matter--the systematic use of a particular inquiry tool on students' individual topics. However, the study is inconclusive about whether or not such instruction actually helps writers write. The data collection stops

short of a complete evaluation of the final research papers. Still, some pedagogical matters may be discussed.

One of the dangers of stimulating invention is overstimulation. Although the ultimate finding was not significant, the performance on the composition plan under the category of "suitable arrangement" favored the control group. The phenomenon of "rhetorical overload" is often blamed for students' inability to write; they so worry about the ideas, the arrangement, and the style of the finished product all through the composing process that they burn themselves out. What prevents the memory from overloading during the invention stage? A sense of arrangement? Aim? Number of pages? Specificity of the subject? Student's motivation? All of these responses seem probable. Others quickly come to mind, but suffice it to say that, rhetorically, writers must account for the reality, the audience, the message, and their own perceptions. That first rhetorical task confronts them during the invention stage; it may be overwhelming for the inexperienced writer who has not yet discriminated the parts from the whole.

The design and development of computer-assisted systems in the rhetorical arena are, of course, limited by factors common to communication and educational settings. As far as the operational cost, these CAI units ran at an average cost of slightly over a dollar per student. The CAI modules are relatively large BASIC programs, averaging over 1100 lines. Although the memory requirements vary depending on the system, approximately 20K accommodates each program on the DEC-10 (KI processor). Certain fundamental problems of cost and size certainly must be considered, but perhaps, more importantly, the systems themselves must be expanded so that student responses to the instruction may grow. To date, a common argument is that CAI systems talk more to the student than the student talks to the system (Annett and Duke, 1970, p. 32). While this restriction does not necessarily impair certain types of learning, such computer domination would certainly hinder CAI-prompted invention. Those educators who conceive of developing creative inquiry modules for computer presentation undoubtedly will have to address this specific issue: what is the appropriate ratio of student to system interaction in the creative process. Obviously, such research is well beyond the scope of a single dissertation, for not only does the

nature of the creative process need more definition, but also man-machine communicacion must be more refined to permit an understanding of natural language processing.

Another important pedagogical issue which will have to be researched at length is how a teacher can select the most appropriate heuristic strategy for the student. There ought to be a way to describe the way a student learns or inquires, and the teacher ought to be able to recognize those strategies and strengthen them. In other words, a teacher can encourage a harmonious relationship between students' unique heuristic strategies and those heuristic strategies which are perhaps more insightful, more comprehensive, and more interactive. As one of the teachers in the experiment noted afterwards, "I think there may be some value in discovering just what kind of students we have. The programs could serve diagnostic functions as well."

Perhaps the most significant implication pedagogically is how to integrate CAI supplementary invention with the other activities in the composition course. Having computer terminals available, having teachers aware that some students need more help with gathering ideas, having reluctant students overcome their computer-inspired anxiety, having a "climate of acceptance" among the English faculty, and having one or

two technical advisors in the computation center are all prerequisites for success. Fortunately, these problems are being overcome. Public computer facilities are appearing in many university libraries; writing laboratories have had computer terminals installed. The rhetorical renaissance continues in English departments as more and more interest is shown in the teaching of composition. Students are less reluctant than many people think; the subjects tended to ask more of the CAI modules than was possible for the programs to respond to appropriately: "What do you know about territorial limits? What can you tell me about coal gasification? Tell me what the librarian knows about underwater living?" The "climate of acceptance" will improve as [illegible] teachers can pass some of their tedious "drill and practice" chores to the writing lab's computer, and [illegible] as professors learn the advantages which the computer can make to their professional work: text editing and formatting, statistical analyses, grade averaging, bibliographical searches, interactive composing, and, in fact, supplementing their teaching. Practically speaking, how much time can a freshman composition realistically give each student when that student is searching for ideas to write about? Thirty minutes a week? If a teacher taught four sections, that

could mean up to 750 hours a semester. The technical help is probably already there; their interest will not be difficult to raise.

Summary

A rhetorical renaissance has recently emerged within the teaching of English composition, but so has an electronic revolution. What this research illustrates above all else is that rhetorical invention and computer technology are indeed compatible; combining heuristic "modes" and computer "media" can well serve and gladly teach the inquisitive writer. Briefly, the CAI modules significantly stimulated both quantity and quality of ideas over a control treatment. The experimental groups, however, became more alike after the computer-administered treatment; consequently, further comparative studies of the Aristotelian topoi, the dramatistic pentad, and the tagmemic matrix may have difficulty achieving statistically significant differences among the groups. Nevertheless, while there were no significant differences among the three experimental groups, some heuristic "trends" may be worth further study. The pentad seemed the most fluent; the tagmemic, the most intellectually interactive; and the Aristotle, the most insightful and the most

comprehensive. Stimulating invention in English composition through computer-assisted instruction is an effective way to begin teaching the art of systematic inquiry and a most appropriate introduction to the richness of heuristic strategies in general. While less desirable than the philosophers' stone, computer-assisted invention can be provided.

Postscript

One student--his name was Joe--at the end of his thirty-minute session, shouted, "Boy, this computer really drained my brain; I can't remember where I parked my bicycle." Another student attacked the system's vulnerability--in responding to questions the modules never say "no"--by asking if premarital sex was okay. Another student came by with his research paper completed a month early, saying he was going to give it to his teacher that afternoon. Four students came back and asked if they could do some more exploring on papers they had to write for other classes. One of the teachers inquired about Coleridge's metaphysics for a paper in a graduate seminar. A good friend on the faculty just wanted to see what I was up to, and he took over forty-five minutes to find out--exploring the dimensions of the writing process of all things.

Another teacher commented that his impression changed from "bad to open-minded curiosity" and that he now was "tempted." If this research has only served to drain brains and tempt colleagues, then it has served its purpose well.

As Norman Cousins (1966) once wrote, "A genuine purpose may be served by turning loose the wonders of the creative imagination on the kinds of problems being put to electronic tubes and transistors." The technology Cousins refers to is now nearly two "generations" beyond the tubes and transistors stage; imagine now turing loose the wonders of the creative spirit on the micro-electronic revolution.

What is the future of CAI in the English curricula? Will it be found in the drill and practice instructional programs only? Walter Maner (1975) foresees the day when generative computer-assisted instruction (GCAI) will emerge as the more effective instrument in the supplementary instructional repertoires of humanists. He writes:

> According to some researchers, the future of ordinary CAI, with its canned questions and repertoire of canned answers, grows dimmer by the day. They would support the use of tedious frame-by-frame approach for only a few more years while educational technicians ready the more powerful generative and

> simulation techniques.
>
> It is not hard to see why. Once a GCAI program has been designed, it is capable of furnishing an inexhaustible supply of distinct problems (and solutions) for the student. (p. 117)

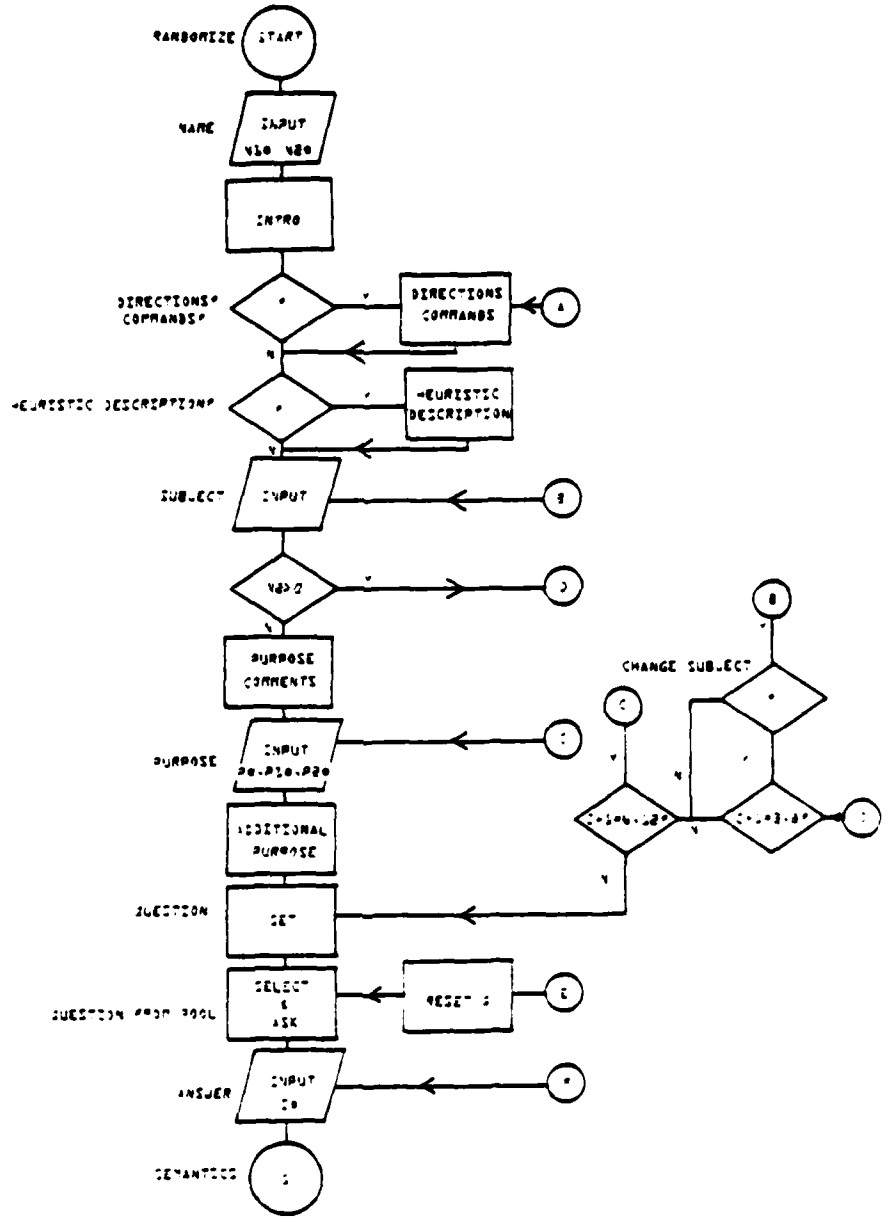
These perceptions are echoed by Dr. Seymour Papert (1978) of MIT:

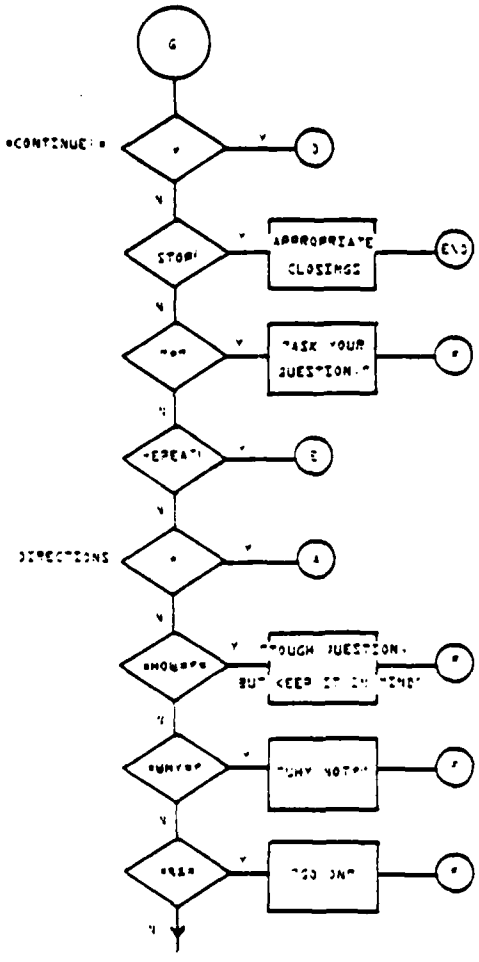
> My experiences suggest that the computer can be a cornerstone of a new learning society if our society embraces the fact that the computer offers us some radically new possibilities to truly becoming a learning society. We are at a turning point because social habits are pushing us into taking what would be revolutionary and making it banal by trying to assimilate computers into educational models that we developed in a pre-computer era.
>
> When we speak about scientific progress we speak of paradigm shifts--these are the stuff of which scientific revolutions are made. Our society needs a mandate to mobilize for such a paradigm shift in our way of looking at computers. Without it, our children will grow up in a computer culture, but one which has not been mobilized for educational revolution. (p. 32)

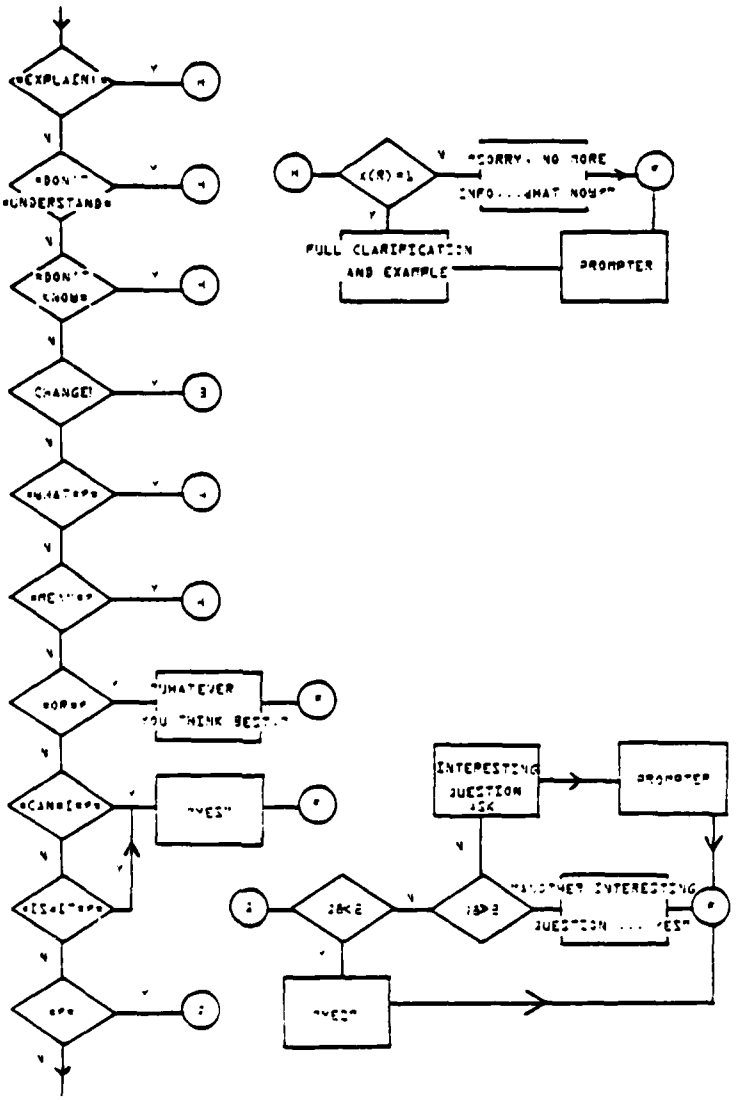
The CAI programs developed and evaluated in this research share the spirit of Maner's and Papert's remarks, for they anticipate the mobilization of an educational revolution in their stimulation of ideas outside a programmed content and in their sufficient, but admittedly limited, semantic capabilities.

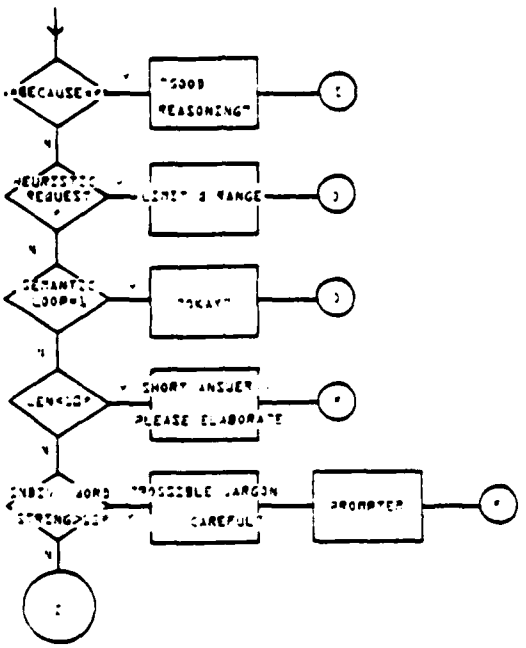
Moreover, research in rhetorical invention and in the entire composing process for that matter rests at the intersection of research in cognitive psychology, research in artificial intelligence, research in curriculum development, and research in educational psychology. Are not such matters well-known by sane people sufficiently interested in the problems of teaching composition? Again, if the humanities must suffer computer-assisted instruction, would not it be better for humanists to create the world they must suffer in?

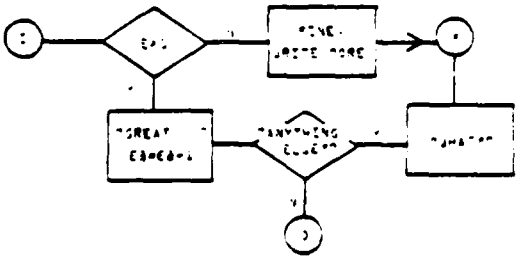
APPENDIX A: Instructional Design Flowchart


RANDOMIZE
START
NAME
INPUT
INTRO
DIRECTIONS?
COMMANDS?
DIRECTIONS
COMMANDS
HEURISTIC DESCRIPTION?
HEURISTIC
DESCRIPTION
SUBJECT
INPUT
PURPOSE
COMMENTS
PURPOSE
INPUT
ADDITIONAL
PURPOSE
QUESTION
SET
SELECT
&
ASK
RESET
ANSWER
INPUT
SEMANTICS
CHANGE SUBJECT


G
"CONTINUE"
Y
J
N
"STOP"
Y
APPROPRIATE
CLOSINGS
END
N
"?"
Y
"ASK YOUR
QUESTION."
F
N
"REPEAT"
Y
E
N
"DIRECTIONS"
Y
A
N
"ANSWERS"
Y
"ROUGH QUESTION."
N
"SURVEY"
Y
"WHY VOTE"
F
N
"YES"
Y
"GO ON"
G
N


"EXPLAIN"
"DON'T UNDERSTAND"
"DON'T KNOW"
"CHANGE"
"WHATEVER"
"CREATIVE"
"OR"
"CAN [ ]"
"IS [ ]"
"PROMPTER"
"YES"
"WHATEVER YOU THINK BEST"
"SORRY, NO MORE INFO...WHAT NOW?"
FULL CLARIFICATION AND EXAMPLE
PROMPTER
INTERESTING QUESTION ASK
PROMPTER
"YES"


"GOOD REASONING"
SHORT ANSWER
PLEASE ELABORATE
PROMPTER



# APPENDIX B: Listings

```
00010   REM   <<<   INVENTION PROGRAM:  ARISTOTLE'S TOPICS   >>>
00020   REM   <<<   AUTHOR:  HUGH BURNS   >>>
00021   REM   <<<   THIS PROGRAM MAY BE USED ONLY WITH THE AUTHOR'S PERM
ISSION.
00022   REM   USE WITHOUT DIRECT PERMISSION VIOLATES COPYRIGHT LAW.   >>
>
00030   RANDOMIZE
00040   DIM X(38)
00050   X(0)=0
00060   DIM Z(38)
00070   Z(0)=0
00080   E=L4=D=C=Q8=E3=0   'COUNTERS
00090   PRINT
00100   PRINT
00110   PRINT
00120   PRINT
00130   PRINT
00140   PRINT,"A COMPUTER-PROMPTED INVENTION PROGRAM:"
00150   PRINT,"-------------------------------------"
00160   PRINT
00170   PRINT,"           ARISTOTLE'S TOPICS"
00180   PRINT,"           ------------------"
00190   PRINT
00200   PRINT
00210   PRINT
00220   PRINT
00230   PRINT,"HELLO AND WELCOME!"
00240   PRINT
00250   PRINT "PLEASE TYPE IN YOUR FIRST NAME:  ";
00260   LINPUT N1$
00270   IF N1$="" THEN 260
00280   PRINT
00290   PRINT "NOW, "N1$", PLEASE TYPE IN YOUR LAST NAME:  ";
00300   LINPUT N2$
00310   IF N2$="" THEN 300
00312   IF N2$="TEST!" THEN 3330
00320   PRINT
00330   PRINT
00340   PRINT "WELL, "N1$" "N2$", I HOPE I CAN BE OF SOME ASSISTANCE"
00350   PRINT "TO YOU TODAY.  IF WE TAKE EACH OTHER SERIOUSLY, YOU'LL"
00360   PRINT "THINK ABOUT YOUR TOPIC AS YOU NEVER HAVE BEFORE."
00370   PRINT
00380   PRINT
00390   PRINT,"BEFORE WE BEGIN, "N1$",  THERE'S AN OLD"
00400   PRINT "SAYING ABOUT COMPUTER-ASSISTED INSTRUCTION,  IT GOES:"
00410   PRINT
00420   PRINT,""GARBAGE IN, GARBAGE OUT!""
00430   PRINT
00440   PRINT "IN OTHER WORDS, YOU AND I MUST WORK TOGETHER SO"
00450   PRINT "YOU CAN GET A GOOD START ON YOUR RESEARCH PAPER."
00460   PRINT
00470   PRINT
00480   PRINT
00490   PRINT,,"(PRESS 'RETURN' TO CONTINUE.)";
00500   LINPUT A$
00510   PRINT
00520   PRINT
00530   PRINT
00540   PRINT "WOULD YOU LIKE TO REVIEW THE DIRECTIONS AND THE COMMANDS?
"
```

```
30550   PRINT,"(YES OR NOT)"
30560   JS="YES"
30570   GOSUB 4880
30580   IF K1$1 THEN 600
30590   GOTO 1570
30600   REM    <<<   DIRECTIONS AND COMMANDS   >>>
30610   PRINT
30620   PRINT
30630   PRINT,"DIRECTIONS:"
30640   PRINT
30650   PRINT
30660   PRINT,"1.  WHEN YOU MAKE A TYPING ERROR, 'MISS', AND"
30670   PRINT,"WISH TO CORRECT IT, USE THE 'RUBOUT' OR '_A' KEY."
30680   PRINT,"THE 'SHIFT' MUST BE DEPRESSED WHEN YOU 'RUBOUT'."
30690   PRINT,"IT MAY LOOK A LITTLE FUNNY (LIKE WRITING BACKWARDS),"
30700   PRINT,"BUT DON'T WORRY; IT WORKS THAT WAY."
30710   PRINT
30720   PRINT
30730   PRINT,"2.  REMEMBER THAT I CAN ONLY READ ABOUT A LINE AND"
30740   PRINT,"A HALF OF INFORMATION AT ONE TIME -- ABOUT THIS MUCH!"
30750   PRINT
30760   PRINT"------------------------------------------------------------
-----------------------------------------"
30770   PRINT
30780   PRINT,"HIT 'RETURN' AT THAT POINT AND I'LL GENERALLY"
30790   PRINT,"LET YOU ADD MORE INFORMATION.  IF THAT DOES NOT WORK,"
30800   PRINT,"TYPE '&&' AND I'LL SAY 'GO ON, MISS'."
30810   PRINT
30820   PRINT
30830   PRINT,,"(PRESS 'RETURN' TO CONTINUE.)";
30840   LINPUT A$
30850   PRINT
30860   PRINT
30870   PRINT,"3.  AFTER YOU FINISH TYPING YOUR RESPONSE, YOU MUST PRESS
"
30880   PRINT,"THE 'RETURN' KEY.  WHEN YOU DO , I'LL READ YOUR"
30890   PRINT,"RESPONSE AND SAY SOMETHING BACK TO YOU."
30900   PRINT
30910   PRINT
30920   PRINT,"4.  THE MOST IMPORTANT OBJECTIVE OF THIS PROGRAM"
30930   PRINT,"IS TO GET YOU THINKING ABOUT YOUR TOPIC."
30940   PRINT
30950   PRINT,"IN ORDER TO ACHIEVE THIS OBJECTIVE,"
30960   PRINT,"YOU ARE GOING TO HAVE TO FORGET THAT I AM A MACHINE."
30970   PRINT
30980   PRINT,"PLEASE ASK QUESTIONS.  YOU'LL BE SURPRISED BY HOW MUCH"
30990   PRINT,"I KNOW (OR SO I HOPE!)  I'M NOT"
31000   PRINT,"GUARANTEEING THE TRUTH, BUT I'LL DO THE BEST I CAN."
31010   PRINT,"MY MEMORY IS STILL DEVELOPING."
31020   PRINT
31030   PRINT
31040   PRINT
31050   PRINT,,"(HIT 'RETURN' TO CONTINUE.)"
31060   PRINT
31070   PRINT
31080   LINPUT A$
31090   PRINT
31100   PRINT
31110   PRINT
31120   PRINT,"COMMANDS:"
```

```
01130   PRINT
01140   PRINT,"TYPE IN--->","I'LL DO THIS--->"
01150   PRINT,"----------","----------------"
01160   PRINT
01170   PRINT,"STOP:","I'LL STOP ASKING QUESTIONS AND CLOSE,"
01180   PRINT
01190   PRINT,"CONTINUE:","I'LL SKIP AHEAD TO THE NEXT QUESTION,"
01200   PRINT
01210   PRINT,"REPEAT:","I'LL REPEAT THE QUESTION,"
01220   PRINT
01230   PRINT,"DIRECTIONS:","I'LL SHOW YOU THESE DIRECTIONS AGAIN,"
01240   PRINT
01250   PRINT,"CHANGE:","I'LL LET YOU CHANGE OR NARROW YOUR SUBJECT,"
01260   PRINT
01270   PRINT,"?","I'LL LET YOU ASK A QUESTION,"
01280   PRINT
01290   PRINT,"EXPLAIN:","I'LL EXPLAIN THE QUESTION,"
01300   PRINT,,"(THIS ONE IS A LOT OF FUN, "N1$",)"
01310   PRINT
01320   PRINT,"&&","I'LL LET YOU CONTINUE WITH YOUR RESPONSE,"
01330   PRINT
01340   PRINT,,"(PRESS 'RETURN' TO CONTINUE,)";
01350   LINPUT A$
01360   PRINT
01370   PRINT
01380   PRINT
01390   PRINT
01400   PRINT,"TWO LAST THINGS!"
01410   PRINT
01420   PRINT,"***  THINK OF ME AS A PERSON WHO CAN ASK A LOT OF"
01430   PRINT,"INTERESTING, THOUGHT-PROVOKING, AND WILD QUESTIONS,"
01440   PRINT
01450   PRINT
01460   PRINT,"***  SCREAM FOR HELP IF I START ACTING REALLY CRAZY!!"
01470   PRINT
01480   PRINT
01490   IF D=1 THEN 1510
01500   GOTO 1570
01510   PRINT,"BACK TO THE QUESTIONS, "N1$"   --->   --->   --->"
01520   PRINT
01530   PRINT
01540   PRINT
01550   PRINT,,"BUT FIRST, IS THERE"
01560   GOTO 6050
01570   PRINT
01580   PRINT
01590   PRINT
01600   PRINT
01610   PRINT "WOULD YOU LIKE A BRIEF EXPLANATION OF HOW"
01620   PRINT "ARISTOTLE'S TOPICS HELP WRITERS WRITE?"
01630   PRINT,"(YES OR NO?)"
01640   J$="YES"
01650   GOSUB 4480
01660   IF K=1 THEN 1680
01670   GOTO 1930
01680   REM   <<<   DESCRIPTION OF ARISTOTLE'S TOPICS   >>>
01690   PRINT
01700   PRINT
01710   PRINT,"I'M GLAD YOU ASKED, "N1$",  BRIEFLY, THE TWENTY-EIGHT"
```

```
 1720   PRINT "ENTHYMEME TOPICS HELP A WRITER (OR A SPEAKER) DISCOVER"
 1730   PRINT "SPECIFIC ARGUMENTS ABOUT SUBJECTS."
 1740   PRINT
 1750   PRINT,"IN HIS 'RHETORIC', ARISTOTLE TELLS US THAT THE AIM OR GOA
L"
 1760   PRINT "OF RHETORIC IS TO PERSUADE AN AUDIENCE.  REMEMBER THAT TE
RM --"
 1770   PRINT "PERSUADE."
 1780   PRINT
 1790   PRINT,"ARISTOTLE BELIEVED THAT IF HIS STUDENTS IN THE"
 1800   PRINT "ACADEMY KNEW AND PRACTICED USING THE TOPICS, THEY WOULD B
ECOME"
 1810   PRINT "EFFECTIVE 'PERSUADERS.'"
 1820   PRINT
 1830   PRINT,"YOU'LL RECOGNIZE AMONG THE TOPICS:"
 1840   PRINT
 1850   PRINT,"1.  QUESTIONS OF DEFINITION;"
 1860   PRINT,"2.  QUESTIONS ABOUT CAUSES AND EFFECTS;"
 1870   PRINT,"3.  QUESTIONS REGARDING OPPOSITES AND ASSOCIATIONS;"
 1880   PRINT,"4.  QUESTIONS ABOUT CONSEQUENCES;"
 1890   PRINT,"5.  AND QUESTIONS ABOUT MATTERS OF FACT AND OPINION."
 1900   PRINT
 1910   PRINT,,"(HIT 'RETURN' TO CONTINUE.)"
 1920   LINPUT AS
 1930   REM    <<<   SUBJECT SEQUENCE   >>>
 1940   PRINT
 1950   PRINT
 1960   PRINT
 1970   PRINT
 1980   PRINT
 1990   PRINT
 2000   PRINT
 2010   PRINT
 2020   PRINT
 2030   PRINT
 2040   PRINT,"NOW I NEED TO FIND OUT WHAT YOU"
 2050   PRINT "ARE WRITING ABOUT, SO WOULD YOU PLEASE TYPE IN YOUR"
 2060   PRINT "SUBJECT.  I AM LOOKING FOR ONE TO THREE WORDS."
 2070   PRINT
 2080   PRINT
 2090   PRINT
 2100   PRINT
 2110   PRINT
 2120   PRINT
 2130   PRINT,!
 2140   LINPUT SS
 2150   IF SS=""THEN 2140
 2160   IF LEN(SS)<40 THEN 2280
 2170   PRINT
 2180   PRINT "THAT'S A MOUTHFUL, "N1$",  MAKE IT SHORTER, LIKE A TITLE.
"
 2190   PRINT,"HERE ARE A FEW EXAMPLES:"
 2200   PRINT
 2210   PRINT,"  **   THE ENERGY CRISIS"
 2220   PRINT,"  **   AUSTIN'S HISTORICAL GARDENS"
 2230   PRINT,"  **   THE BERMUDA TRIANGE"
 2240   PRINT
 2250   PRINT
 2260   PRINT,"YOUR TURN,  WHAT IS YOUR SUBJECT?"
 2270   GOTO 2120
```

```
 2280   IF N8>0 THEN 2300
 2290   GOTO 2360
 2300   PRINT
 2310   PRINT "YOUR REVISED SUBJECT IS "S$"."
 2320   PRINT
 2330   PRINT
 2340   PRINT
 2350   PRINT
 2360   PRINT
 2370   GOTO 2210
 2380   J=INT(3*RND+1)
 2390   ON J GOTO 2400,2440,2480
 2400   PRINT   'INFORMAL ACKNOWLEDGEMENT OF SUBJECT
 2410   PRINT "HOLY ELECTRONICS!  THAT'S WEIRD, I USED TO DATE A COMPUTE
R"
 2420   PRINT "INTERESTED IN "S$"."
 2430   GOTO 2520
 2440   PRINT
 2450   PRINT "HEY, THAT'S NEAT, "N1$"!  WE'LL HAVE A GOOD TIME THINKING
"
 2460   PRINT "ABOUT "S$"."
 2470   GOTO 2520
 2480   PRINT
 2490   PRINT S$", HMMMM!  WILL YOU BE AMAZED"
 2500   PRINT "BY THE RECENT SCHOLARSHIP.  BE SURE TO ASK THE LIBRARIAN"
 2510   PRINT "IN THE REFERENCE AREA."
 2520   REM   <<<   PURPOSE SEQUENCE   >>>
 2530   PRINT
 2540   PRINT
 2550   PRINT
 2560   PRINT
 2570   PRINT
 2580   PRINT,"A COMMENT ABOUT PURPOSE:"
 2590   PRINT
 2600   PRINT
 2610   PRINT
 2620   PRINT,"DURING THIS EXPLORATION PROCESS,"
 2630   PRINT,"YOU WILL BE ASKED TO CLARIFY THE PURPOSE OF"
 2640   PRINT,"YOUR PAPER ON "S$"."
 2650   PRINT
 2660   PRINT
 2670   PRINT,"SO NOW WOULD YOU BRIEFLY DESCRIBE WHAT THE PURPOSE"
 2680   PRINT,"OF YOUR PAPER BY COMPLETING"
 2690   PRINT,"THIS STATEMENT:  THE PURPOSE OF THIS PAPER IS TO, . . ."
 2691   PRINT,"(LIMIT:  ONE LINE)"
 2700   PRINT
 2710   PRINT
 2720   LINPUT P$
 2730   IF P$=""THEN 2720
 2740   PRINT
 2741   GOSUB 3321
 2750   PRINT
 2760   PRINT,"FINE, "N1$", YOU AND I WILL TALK AGAIN ABOUT YOUR"
 2770   PRINT,"PURPOSE."
 2780   PRINT
 2790   PRINT
 2800   GOTO 3330
 2810   PRINT   'PURPOSE SUBROUTINE AT C+1=8
 2820   PRINT
```

```
32030   PRINT,"BEFORE WE CONTINUE, "N1$", I WANT YOU"
32040   PRINT,"TO THINK ABOUT YOUR PURPOSE ONCE AGAIN,"
32050   PRINT
32060   PRINT,"YOU HAVE ALREADY TOLD ME THAT YOUR PURPOSE WAS"
32070   PRINT"TO "P$","
32080   PRINT
32090   PRINT
32900   PRINT,"NOW WOULD YOU COMPLETE THIS STATEMENT?"
32910   PRINT
32920   PRINT,"IF NOTHING ELSE, I WANT MY READER TO UNDERSTAND, . . ."
32921   PRINT,"(ONE LINE, PLEASE)"
32930   PRINT
32940   PRINT
32950   LINPUT P1$
32960   IF P1$="" THEN 2950
32970   PRINT
32971   GOSUB 3321
32980   PRINT,"OKAY, FINE.  KEEP YOUR PURPOSE IN MIND AS WE CONTINUE."
32990   PRINT
33000   PRINT
33010   PRINT
33020   PRINT,"HERE IS YOUR NEXT QUESTION -- NUMBER"C+1","
33030   PRINT
33040   PRINT
33050   GOTO 3530
33060   PRINT   "PURPOSE SUBROUTINE AT C+1812
33070   IF N$=0 THEN 3000
33080   PRINT
33090   PRINT,"LET'S PAUSE ONCE AGAIN TO CONSIDER YOUR INTENT,"
33100   PRINT
33110   PRINT,"YOUR GENERAL PURPOSE IS TO"
33120   PRINT P$
33130   PRINT
33140   PRINT,"ALSO, YOU WANT YOUR READER TO UNDERSTAND"
33150   PRINT P1$","
33160   PRINT
33170   PRINT
33180   PRINT,"IS THERE ANYTHING ELSE YOU WISH TO SAY ABOUT PURPOSE?"
33190   PRINT,,"(YES OR NO?)"
33200   J$="YES"
33210   GOSUB 4000
33220   IF K1=1 THEN 3200
33230   PRINT
33240   PRINT,"FINE, "N1$", ENOUGH ABOUT PURPOSE,"
33250   GOTO 3000
33260   PRINT
33270   PRINT,"GREAT, "N1$", WHAT WOULD YOU LIKE TO ADD?"
33271   PRINT,"(ONE LINE LIMIT IN EFFECT)"
33280   PRINT
33290   PRINT
33300   LINPUT P2$
33310   IF P2$=""THEN 3300
33311   GOSUB 3321
33320   GOTO 3230
33321   PRINT
33322   PRINT,"ANY MORE?"
33323   PRINT,"(IF SO, TYPE WHATEVER IT IS; IF NOT, TYPE 'NO'.)"
33324   PRINT
33325   LINPUT A$
33326   PRINT
```

```
3327   RETURN
3330   PRINT   "PAGING OPENING QUESTIONING SEQUENCE
3340   PRINT
3350   PRINT
3360   PRINT
3370   PRINT
3380   PRINT,"RELAX NOW, "N1$", AND ENJOY THIS BRAINSTORMING SESSION."
3390   PRINT
3400   PRINT
3410   PRINT
3420   PRINT
3430   PRINT
3440   PRINT
3450   PRINT
3460   PRINT
3470   PRINT
3480   PRINT
3490   PRINT
3500   PRINT
3510   PRINT
3520   REM   <<<   COUNTER/EXPLORATION CONTROLS   >>>
3530   C=C+1
3540   E=L+Q8+Q6+8
3550   IF C>30 THEN 1020
3560   IF C>5 THEN 3610'OPENS TOTAL POOL AFTER FIVE QUESTIONS
3570   Q=R=INT(10*RND+1)
3580   IF Z(Q)=1 THEN 3570
3590   Z(Q)=1
3600   GOTO 3740
3610   Q=R=INT(30*RND+1)
3620   IF Z(Q)=1 THEN 3610
3630   Z(Q)=1
3640   IF Q<11 THEN 3740
3650   IF Q<21 THEN 3680
3660   IF Q<31 THEN 3720
3670   IF Q<39 THEN 3720
3680   Q=Q-10
3690   GOTO 3750
3700   Q=Q-20
3710   GOTO 3760
3720   Q=Q-30
3730   GOTO 3770
3740   ON Q GOTO 3790,4090,4370,3870,3890,3920,4490,4600,4280,4230
3750   ON Q GOTO 4460,3810,4120,4150,4180,4210,4230,4250,4080,4310
3760   ON Q GOTO 4340,3840,3940,4430,4460,4490,4520,4550,4570,4600
3770   ON Q GOTO 4620,4650,4680,4710,4740,4770,3970,4840
3780   REM   <<<   QUESTION POOL FOR ARISTOTLE'S TOPICS   >>>
3790   PRINT "WHAT IS THE OPPOSITE OF "S$"?"
3800   GOTO 5050
3810   PRINT "TAKE EACH WORD OF "S$" INDIVIDUALLY."
3820   PRINT "WHAT DOES IT MEAN?  CONNOTATIONS?  DENOTATIONS?"
3830   GOTO 5050
3840   PRINT "WHAT IS THE MOST LIKELY PLACE FOR"
3850   PRINT S$" TO EXIST?"
3860   GOTO 5050
3870   PRINT "HOW DOES TIME AFFECT "S$"?"
3880   GOTO 5050
3890   PRINT "WHAT SPECIAL EXPERIENCES MADE YOU SELECT"
3900   PRINT S$" AS YOUR TOPIC?"
```

```
23910   GOTO 5050
23920   PRINT "DEFINE "$$"."
23930   GOTO 5050
23940   PRINT "FILL IN THE BLANK:  IF "$$","
23950   PRINT "THEN _____."
23960   GOTO 5050
23970   PRINT "FILL IN THE BLANK:  IF "$$
23980   PRINT "PLUS _____, THEN _____."
23990   GOTO 5050
24000   PRINT "DIVIDE "$$" INTO THREE"
24010   PRINT "SUB-TOPICS."
24020   GOTO 5050
24030   PRINT "WHAT HAS BEEN DECIDED ABOUT "$$
24040   PRINT "TO DATE."
24050   GOTO 5050
24060   PRINT "WHAT STILL MUST BE DECIDED ABOUT"
24070   PRINT $$"?  DESCRIBE."
24080   GOTO 5050
24090   PRINT "WHAT ARE THE GOOD CONSEQUENCES OF"
24100   PRINT $$"?"
24110   GOTO 5050
24120   PRINT "WHAT ARE THE BAD CONSEQUENCES OF"
24130   PRINT $$"?  DESCRIBE."
24140   GOTO 5050
24150   PRINT "WHO MIGHT BELIEVE THAT THE GOOD CONSEQUENCES OF"
24160   PRINT $$" ARE BAD?"
24170   GOTO 5050
24180   PRINT "WHO WOULD YOU CONSIDER AN AUTHORITY"
24190   PRINT "ON "$$"?"
24200   GOTO 5050
24210   PRINT "WHO GIVES (AND WHO RECEIVES) "$$"?"
24220   GOTO 5050
24230   PRINT "WHAT MAKES YOU SOMETHING OF AN AUTHORITY ON "$$"?"
24240   GOTO 5050
24250   PRINT "WHAT PARTS OF "$$" SHOULD BE"
24260   PRINT "DISCUSSED SEPARATELY?"
24270   GOTO 5050
24280   PRINT "DOES PUBLIC OPINION ABOUT "$$
24290   PRINT "DIFFER FROM PRIVATE OPINION?"
24300   GOTO 5050
24310   PRINT "DO ALL ASPECTS OF "$$" MAKE"
24320   PRINT "SENSE TO YOU?  DESCRIBE THOSE THAT DO NOT."
24330   GOTO 5050
24340   PRINT "HOW DOES THE GENERAL PUBLIC FEEL"
24350   PRINT "ABOUT "$$"?"
24360   GOTO 5050
24370   PRINT "WHAT COULD BE CONSIDERED A RESULT"
24380   PRINT "OF "$$"?"
24390   GOTO 5050
24400   PRINT "WHAT COULD BE CONSIDERED A CAUSE"
24410   PRINT "OF "$$"?"
24420   GOTO 5050
24430   PRINT "ARE THE RESULTS OF "$$" USUALLY"
24440   PRINT "THE SAME?  DESCRIBE."
24450   GOTO 5050
24460   PRINT "WHAT MOTIVATES PEOPLE TOWARD ON"
24470   PRINT "AGAINST "$$"?"
24480   GOTO 5050
24490   PRINT "WHAT WILL MAKE PEOPLE CHANGE THEIR MINDS ABOUT"
```

```
24500   PRINT SS"?"
24510   GOTO 5050
24520   PRINT "ARE THE CAUSES OF "SS" ALWAYS"
24530   PRINT "THE SAME?  DESCRIBE."
24540   GOTO 5050
24550   PRINT "WHAT'S INCREDIBLE ABOUT "SS"?"
24560   GOTO 5050
24570   PRINT "ARE THE CAUSES OF "SS" ALWAYS"
24580   PRINT "DIFFERENT?  EXPLAIN."
24590   GOTO 5050
24600   PRINT "WHAT CONTRADICTIONS EXIST IN "SS"?"
24610   GOTO 5050
24620   PRINT "WHAT FACTS ARE YOU UNLIKELY TO KNOW"
24630   PRINT "ABOUT "SS"?"
24640   GOTO 5050
24650   PRINT "ARE ALL THE FACTS ABOUT "SS" AS"
24660   PRINT "CLEAR AS YOU WOULD LIKE?  DESCRIBE THE AMBIGUITIES."
24670   GOTO 5050
24680   PRINT "WHAT IS A "BETTER COURSE" FOR"
24690   PRINT SS" TO TAKE?  RECOMMENDATIONS?"
24700   GOTO 5050
24710   PRINT "WHAT WOULD BE THE WORST THING THAT COULD HAPPEN TO"
24720   PRINT SS"?"
24730   GOTO 5050
24740   PRINT "WHAT WOULD BE THE BEST THING THAT COULD HAPPEN TO"
24750   PRINT SS"?"
24760   GOTO 5050
24770   PRINT "WHAT ARE SOME OF THE PREVIOUS MISTAKES ABOUT"
24780   PRINT SS"?"
24790   GOTO 5050
24800   PRINT "WHAT OBJECTS DO YOU ASSOCIATE"
24810   PRINT "WITH "SS"?  HOW MIGHT THEY"
24820   PRINT "BE INCLUDED IN YOUR THEME?"
24830   GOTO 5050
24840   PRINT "WHAT'S INCONSISTENT ABOUT "SS"?"
24850    PRINT "PLACES?  PEOPLE?  ACTIONS?  PURPOSES?"
24860   GOTO 5050
24870   REM   <<<   KEYWORD SUBROUTINE   >>>
24880   LINPUT IS
24890   IF IS=""THEN 4880
24900   W=1
24910   K1=1
24920   I=2
24930   L8=LEN(J$)
24940   V=INSTR(I,J$,"=")
24950   T1$=MID$(J$,I,V-I)
24960   V1=INSTR(W,I$,T1$)
24970   IF V1<>0 THEN 5000
24980   K1=0
24990   RETURN
25000   I=V+1
25010   W=V1+1
25020   IF V<L0 THEN 4940
25030   RETURN
25040   REM   <<<   SIGNAL REMARKS (SEMANTIC STARS) FOR BRANCHING   >>>
25050   PRINT
25060   PRINT
25070   J$="CONTINUE;="
25080   GOSUB 1000
25090   IF K1=1 THEN 4180
```

```
25092   IF IS="NO" THEN 6622
25100   JS="•STOP!•"
25110   GOSUB 4890
25120   IF K1=1 THEN 10323
25130   JS="•REPEAT!•"
25140   GOSUB 4890
25150   IF K1=1 THEN 7420
25160   IF IS="?" THEN 6750
25170   JS="•DIRECTIONS!•"
25180   GOSUB 4890
25190   D=1
25200   IF K1=1 THEN 600
25210   JS="•HOW•?•"
25220   GOSUB 4A90
25230   IF K1=1 THEN 6810
25240   JS="•WHY•?•"
25250   GOSUB 4890
25260   IF K1=1 THEN 6880
25270   JS="•&&•"
25280   GOSUB 4890
25290   IF K1=1 THEN 6720
25300   JS="•EXPLAIN!•"
25310   GOSUB 4890
25320   IF K1=1 THEN 7470
25330   JS="• DO•NOT •UNDERST•"
25340   GOSUB 4890
25350   IF K1=1 THEN 7470
25360   JS="• DO•NOT •KNOW•"
25370   GOSUB 4890
25380   IF K1=1 THEN 7470
25390   JS="•CHANGE!•"
25400   GOSUB 4890
25410   IF K1=1 THEN 6920
25420   JS="•WHAT•?•"
25430   GOSUB 4890
25440   IF K1=1 THEN 7470
25450   JS="•MEAN•?•"
25460   GOSUB 4890
25470   IF K1=1 THEN 7470
25480   JS="• OR •?•"
25490   GOSUB 4A90
25500   IF K1=1 THEN 7900
25510   JS="•CAN I •?•"
25520   GOSUB 4890
25530   IF K1=1 THEN 7040
25540   JS="•IS •IT •?•"
25550   GOSUB 4890
25560   IF K1=1 THEN 7040
25570   JS="•BECAUSE•"
25580   GOSUB 4890
25590   IF K1=1 THEN 7980
25600   JS="•?•"
25610   GOSUB 4890
25620   IF K1=1 THEN 7110
25630   IF L6=1 THEN 6160'COUNTER TO CONTINUE AUTOMATICALLY
25635   IF J6>0 THEN 5780    'PREVENTS SHORT RESPONSES AFTER && COMMAND
25640   IF LEN(IS)<10 THEN 7240
25650   A=LEN(IS)    'CHECKS LENGTH OF INDIVIDUAL WORDS IN STRING
25660   FOR K=1 TO A-1
25670   IF MID$(IS,K,1)=" " THEN 5710
```

```
25680   X=X+1
25690   IF X>15 THEN 5740
25700   GOTO 5720
25710   X=0
25720   NEXT K
25730   GOTO 5760
25740   X=3
25750   GOTO 6630
25760   X=0
25770   REM   <<<   EXPLORATION BRANCHING AND FEEDBACK   >>>
25780   PRINT
25790   PRINT
25800   F1=INT(4*RND+1)
25810   F2=INT(5*RND+1)
25820   E=E+1
25830   IF E>1 THEN 5930
25840   ON F1 GOTO 5850,5870,5890,5910
25850   PRINT "GOOD, "N1$", ADD TO YOUR RESPONSE NOW,"
25860   GOTO 5950
25870   PRINT "FINE, "N1$",  WRITE SOME MORE,"
25880   GOTO 5950
25890   PRINT "THAT'S THE IDEA, "N1$",  GIVE ME SOME MORE INFO NOW,"
25900   GOTO 5950
25910   PRINT "BY GEORGE, "N1$", GOOD ONE,  WRITE A LITTLE MORE PLEASE,"
25920   GOTO 5950
25930   ON F2 GOTO 5940,5960,5980,6000,6020
25940   PRINT "SUPER, "N1$"!"
25950   GOTO 6030
25960   PRINT "OUTSTANDING, "N1$"!"
25970   GOTO 6030
25980   PRINT "FANTASTIC, "N1$"!"
25990   GOTO 6030
26000   PRINT "TERRIFIC, "N1$"!"
26010   GOTO 6030
26020   PRINT "GREAT, "N1$"!"
26030   PRINT
26040   E3=E3+1   'E3=COUNTER FOR FULLY EXPLORED QUESTIONS
26050   PRINT,,"ANYTHING ELSE?"
26060   IF E3>2 THEN 6110
26070   PRINT,,"(YOU CAN ADD MORE INFO, ASK A"
26080   PRINT,,"QUESTION, OR GIVE A COMMAND --"
26090   PRINT,,"WHATEVER YOU WISH,)"
26100   PRINT
26110   J$="YE"
26120   GOSUB 4880
26130   IF K1=1 THEN 6760
26140   L=1
26150   GOTO 5100
26160   PRINT
26170   PRINT,"OKAY,"
26180   PRINT
26190   IF C=3 THEN 7290
26200   IF C=8 THEN 7290
26210   IF C=10 THEN 2810
26220   IF C=12 THEN 3060
26230   PRINT
26240   PRINT
26250   M=INT(10*RND+1)
26260   ON M GOTO 6270,6290,6310,6330,6350,6370,6390,6410,6430,6450
```

```
26270   PRINT "(SEE IF YOU CAN USE SOME MORE ACTION VERBS IN YOUR RESPON
SE.)"
26280   GOTO 6460
26290   PRINT "(REMEMBER NOT TO WORRY ABOUT SPELLING!!)"
26300   GOTO 6460
26310   PRINT "(I'LL EXPLAIN MORE IF YOU ASK ME ON THIS NEXT QUESTION.)"
26320   GOTO 6460
26330   PRINT "(AFTER I ASK THIS NEXT QUESTION, TYPE 'WHAT?' AND STAND B
ACK.)"
26340   GOTO 6460
26350   PRINT "(SEE IF YOU CAN USE THE WORD 'BECAUSE' IN YOUR NEXT ANSWE
R.)"
26360   GOTO 6460
26370   PRINT "(IF YOU DON'T UNDERSTAND, JUST SAY SO NEXT TIME.  I'LL HE
LP.)"
26380   GOTO 6460
26390   PRINT "(I REPEAT QUESTIONS IF YOU TYPE 'REPEAT!')"
26400   GOTO 6460
26410   PRINT "(IF YOU NEED MORE ROOM, TYPE '&&' AT THE END OF A LINE.)"
26420   GOTO 6460
26430   PRINT "(TRY USING SOME MORE VERBS FOR BETTER EXPLANATIONS.)"
26440   GOTO 6460
26450   PRINT "(TRY EXPLAINING A LITTLE MORE.  LESS PHRASES, MORE SENTEN
CES.)"
26460   PRINT
26470   PRINT
26480   PRINT
26490   PRINT
26500   CB=INT(5*RND+1)
26510   ON CB GOTO 6520,6540,6560,6580,6600
26520   PRINT "WE'RE MOVING RIGHT ALONG.  HERE IS QUESTION"C+1"."
26530   GOTO 6610
26540   PRINT "AND HERE COMES A REALLY INTERESTING QUESTION -- NUMBER"C+
1"."
26550   GOTO 6610
26560   PRINT "QUESTION"C+1"-- ONE OF MY ALL-TIME FAVORITES COMING UP."
26570   GOTO 6610
26580   PRINT "YOUR NEXT QUESTION IS NUMBER"C+1"."
26590   GOTO 6610
26600   PRINT "HERE IS QUESTION"C+1", "N1$"."
26610   PRINT
26620   GOTO 3530
26622   PRINT   'RESPONDS TO IS=NO AFTER INVENTION PROMPTER
26623   PRINT,"YOU COULD TELL ME 'WHY NOT', BUT YOU"
26624   PRINT "MAY JUST WANT TO CONTINUE.  IF SO, TYPE 'CONTINUE!"
26625   PRINT "(DON'T FORGET THE EXCLAMATION POINT!)"
26626   GOTO 5850
26630   PRINT   'RESPONSE TO 'GARBAGE' OR JARGON
26640   PRINT,"HEY, "N1$", WHAT KIND OF LANGUAGE IS THAT?"
26650   PRINT,"TRY AGAIN.  I JUST CAN'T UNDERSTAND WHAT YOU SAID?"
26660   PRINT
26670   PRINT,"(YOU MAY HAVE RUN SOME OF YOUR WORDS TOGETHER,"
26680   PRINT,"SO IF YOU CAN UNDERSTAND WHAT YOU MEAN, JUST"
26690   PRINT,"KEEP ON ANSWERING THIS QUESTION.  I'LL REPEAT"
26700   PRINT,"THE QUESTION IF YOU TYPE 'REPEAT!')"
26710   GOTO 5850
26720   PRINT   'ANSWERS THE COMMAND &&
26730   PRINT "GO ON, "N1$"."
26735   C=C-1
26740   GOTO 5850
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```
06750   PRINT   'ANSWERS THE SINGLE QUESTION MARK (I$="?")
06760   PRINT "GO AHEAD, "N1$", ASK.  I'LL DO THE BEST I CAN."
06770   GOTO 5050
06780   PRINT    'ANSWERS A "YE" TO ANYTHING ELSE?
06790   PRINT "WHAT?"
06800   GOTO 5050
06810   PRINT   'ANSWERS THE QUESTION "HOW"?"
06820   PRINT "I COULD SAY THAT THAT'S FOR ME TO KNOW AND FOR YOU TO FIN
D OUT."
06830   PRINT
06840   PRINT "SERIOUSLY, I CANNOT PRETEND TO KNOW 'HOW', BUT YOU"
06850   PRINT "SHOULD KEEP EXPLORING FOR AN ANSWER."
06860   PRINT
06870   GOTO 5050
06880   PRINT   'ANSWERS THE QUESTION "WHY"?"
06890   PRINT "WELL, WHY NOT?  REMEMBER WE ARE EXPLORING, BRAINSTORMING!
"
06900   PRINT
06910   GOTO 5050
06920   N8=N8+1   'ANSWERS THE "CHANGE;" COMMAND
06930   IF N8>1 THEN 6970
06940   PRINT
06950   PRINT "GOOD FOR YOU, "N1$".  NOT EVERY WRITER NARROWS OR"
06960   PRINT "CHANGES HIS OR HER TOPIC THIS EARLY IN THE INVENTION PROC
ESS."
06970   PRINT
06980   PRINT "PLEASE TYPE IN YOUR NEW SUBJECT:"
06990   GOTO 2120
07000   PRINT   'ANSWERS QUESTION " OR "?"
07010   PRINT "WHATEVER YOU THINK BEST, "N1$".  YOU DECIDE."
07020   PRINT
07030   GOTO 5050
07040   PRINT   'ANSWERS QUESTION "CAN I "?"
07050   PRINT "YES, OF COURSE."
07060   PRINT
07070   GOTO 5050
07080   PRINT   'RESPONDS TO SUBORDINATE "BECAUSE"
07090   PRINT,"I LIKE YOUR REASONING."
07100   GOTO 5000
07110   PRINT   'RESPONDS TO "?"
07120   J8=G8+1
07130   IF J8<2 THEN 7180
07140   IF J8>2 THEN 7710
07150   PRINT "ANOTHER INTERESTING QUESTION.  I'D SAY 'YES'."
07160   PRINT
07170   GOTO 9910
07180   PRINT "YES, THAT SEEMS OKAY."
07190   PRINT
07200   GOTO 9970
07210   PRINT "THIS QUESTION MAY BE BETTER ANSWERED"
07220   PRINT "DURING THE RESEARCH PHASE.  KEEP IT IN MIND."
07230   GOTO 9930
07240   PRINT   'RESPONDS TO SHORT ANSWERS
07250   PRINT,"AHHH, SHORT AND SWEET.  NOW TELL ME"
07260   PRINT,"WHY?  IN OTHER WORDS, ELABORATE A LITTLE."
07270   PRINT
07280   GOTO 5050
07290   PRINT   'AUTO NARROW/CHANGE LOOP
07300   PRINT
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 7310   PRINT "DO YOU WISH TO NARROW OR CHANGE YOUR SUBJECT?"
 7320   PRINT "(MAYBE REVISE THE WAY IT SOUNDS IN THESE QUESTIONS?)"
 7330   PRINT,"(YES OR NO?)"
 7340   J$="eYEe"
 7350   GOSUB 4660
 7360   IF K1=1 THEN 6920
 7370   PRINT
 7380   PRINT
 7390   PRINT
 7400   PRINT
 7410   GOTO 6210
 7420   PRINT   "REPRINTS QUESTION
 7430   IF Q=R THEN 3740
 7440   IF Q+10=R THEN 3750
 7450   IF Q+20=R THEN 3760
 7460   IF Q+30=R THEN 3770
 7470   REM   <<<   CLARIFICATION ARRAY AND EXAMPLE SEQUENCE   >>>
 7480   PRINT
 7490   IF X(R)=1 THEN 9990
 7500   X(R)=1
 7510   IF R<11 THEN 7610
 7520   IF R<21 THEN 7550
 7530   IF R<31 THEN 7570
 7540   IF R<39 THEN 7590
 7550   R1=R1-10
 7560   GOTO 7620
 7570   R1=R1-20
 7580   GOTO 7630
 7590   R1=R1-30
 7600   GOTO 7642
 7610   ON R1 GOTO 7650,8320,8900,7830,7900,7960,8990,9770,8700,8190
 7620   ON R1 GOTO 8260,7750,8410,8480,8530,8570,8620,8670,8120,8780
 7630   ON R1 GOTO 8840,7890,8000,9070,9130,9160,9230,9280,9310,9370
 7640   ON R1 GOTO 9440,9520,9560,9630,9670,9720,9850,9830
 7650   PRINT "SOMETIMES A GOOD WAY TO DESCRIBE SOMETHING IS BY TELLING"
 7660   PRINT "WHAT IT IS NOT.  THERE MAY OR MAY NOT BE A DIRECT"
 7670   PRINT "OPPOSITE OF "$$", BUT"
 7680   PRINT "SEE IF YOU CAN THINK OF ONE."
 7690   PRINT
 7700   PRINT "FOR EXAMPLE, IF I WERE WRITING A PAPER ON SOLAR"
 7710   IF 38=4 THEN 9990
 7720   PRINT "ENERGY, AN ANSWER TO THIS QUESTION MIGHT PRODUCE A"
 7730   PRINT "LIST OF EARTH'S NATURAL ENERGY RESOURCES."
 7740   GOTO 9940
 7750   PRINT "A 'CONNOTATION' IS AN ASSOCIATION; A 'DENOTATION' IS"
 7760   PRINT "A DICTIONARY MEANING.  THIS TACTIC OF THINKING ABOUT"
 7770   PRINT "THE INDIVIDUAL WORDS IN A TOPIC OFTEN BRINGS"
 7780   PRINT "A FRESH INSIGHT."
 7790   GOTO 9930
 7800   PRINT "WHERE SHOULD I GO TO SEE "$$"?"
 7810   PRINT "CAN I GO INSIDE?  CAN I GO OUTSIDE?  WHY OR WHY NOT?"
 7820   GOTO 9960
 7830   PRINT "ARISTOTLE THOUGHT ABOUT TIME AND CHANGE OFTEN.  DOES"
 7840   PRINT $$" CHANGE OVER TIME?"
 7850   PRINT
 7860   PRINT "FOR EXAMPLE, IF I WERE WRITING A PAPER ABOUT DIAMOND MINI
NG,"
 7870   PRINT "I MIGHT WANT TO RESEARCH HOW TECHNOLOGY HAS CHANGED THE"
 7880   PRINT "MINING PROCESS."
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27490   GOTO 9980
27500   PRINT "IF YOU HAVE A GOOD ANSWER HERE, YOU WILL PROBABLY WRITE"
27510   PRINT "A DECENT PAPER.  BY 'SPECIAL', I MEAN 'UNIQUE',"
27520   PRINT "'INTERESTING', OR 'IMPORTANT'.  THESE EXPERIENCES DO NOT"
27530   PRINT "NECESSARILY HAVE TO BE YOURS; YOU COULD PRETEND TO BE A"
27540   PRINT "REPORTER."
27550   GOTO 9930
27560   PRINT "YOU MIGHT SPEND ALL DAY ON THIS QUESTION, BUT I AM"
27570   PRINT "AFTER A SHORT DEFINITION,  IN LESS THAN TWENTY WORDS,"
27580   PRINT "WHAT IS "$$"?"
27590   GOTO 9960
28000   PRINT "THIS IS A TYPE OF INDUCTION, "N1$".  I AM NOT TRYING"
28010   PRINT "TO BE TRICKY.  IN OTHER WORDS, IF YOUR TOPIC EXISTS,"
28020   PRINT "THEN OTHER THINGS--FEELINGS, ACTIONS, ETC.--ALSO EXIST,"
28030   PRINT "TRY MAKING A CONNECTION OR TWO."
28040   GOTO 9980
28050   PRINT "THIS QUESTION ASKS YOU TO CREATE A COMPLICATED"
28060   PRINT "INDUCTION.  THINK OF IT IN MATHEMATICAL TERMS:"
28070   PRINT
28080   PRINT,"IF 2 + ? THEN ?"
28090   PRINT
28100   PRINT "THERE ARE MANY ANSWERS (2+2=4, 2+90=92,....),"
28110   GOTO 9930
28120   PRINT "I LIKE ASKING THIS QUESTION BECAUSE IT MAY HELP YOU ORGAN
IZE"
28130   PRINT "YOUR PAPER.  WHAT ARE THREE OF THE MAJOR PARTS THAT CREAT
E"
28140   PRINT "THE WHOLE OF "$$"?"
28150   PRINT
28160   PRINT "YOU MIGHT WANT TO WRITE SOMETHING HERE ABOUT HOW THESE"
28170   PRINT "PARTS ARE RELATED."
28180   GOTO 9960
28190   PRINT "DECISIONS HAVE BEEN MADE ABOUT "$$"."
28200   PRINT "WHAT WERE THEY ABOUT?  WHO MADE THEM?"
28210   PRINT
28220   PRINT "FOR EXAMPLE, IF I WERE WRITING A PAPER ABOUT INFLATION,"
28230   PRINT "I WOULD WANT TO WRITE A PARAGRAPH OR TWO ABOUT THE"
28240   PRINT "GOVERNMENT'S LEGISLATION TO DATE."
28250   GOTO 9900
28260   PRINT "WHAT DECISIONS WILL HAVE TO BE MADE IN THE FUTURE"
28270   PRINT "CONCERNING "$$"."
28280   PRINT
28290   PRINT "FILL IN THE BLANKS:  CONCERNING "$$","
28300   PRINT "WE MUST DECIDE WHETHER OR NOT TO DO _____.
____."
28310   GOTO 9930
28320   PRINT "WHAT GOOD WILL COME ABOUT FROM MANKIND'S CONCERN ABOUT"
28330   PRINT $$"?"
28340   PRINT
28350   PRINT"FOR EXAMPLE, IF I WERE WRITING A PAPER ABOUT COLLEGE"
28360   PRINT "ACADEMICS, SOME OF THE GOOD CONSEQUENCES MAY BE A BETTER"
28370   PRINT "JOB IN THE FUTURE, A FULLER UNDERSTANDING"
28380   PRINT "ABOUT OUR WORLD, AND AN APPRECIATION FOR GOOD STUDY HABIT
S."
28390   PRINT "(STOP THE SNICKERING AND GET ON WITH AN ANSWER,)"
28400   GOTO 9960
28410   PRINT "WHAT BAD WILL COME ABOUT FROM MANKIND'S CONCERN ABOUT"
28420   PRINT $$"?"
28430   PRINT
```

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28440    PRINT "IN OTHER WORDS, WHAT WAS, IS, AND WILL BE THE 'BAD NEWS'"
28450    PRINT "OF THIS TOPIC.  IF YOU CANNOT THINK OF ANYTHING BAD, THEN
"
28460    PRINT "WHY NOT?"
28470    GOTO 9900
28480    PRINT "HERE, "N1$", WE ARE SEARCHING FOR THE PEOPLE WHO"
28490    PRINT "HAVE COUNTER-ARGUMENTS.  LAWYERS ARE ALWAYS INTERESTED"
28500    PRINT "IN THIS PARTICULAR QUESTION.  MOST ISSUES WE WRITE ABOUT"
28510    PRINT "ARE NOT THAT CLEAR-CUT, NOT THAT 'BLACK AND WHITE.'"
28520    GOTO 9930
28530    PRINT "BY 'AUTHORITY', I MEAN A SO-CALLED EXPERT."
28540    PRINT "AS YOU WRITE THE PAPER, YOU MAY QUOTE THESE PEOPLE."
28550    PRINT "GENERALLY, THEIR OPINIONS ARE RESPECTED--IF NOT BELIEVED.
"
28560    GOTO 9960
28570    PRINT "I AM OFTEN SURPRISED BY THE CREATIVE ANSWERS TO THIS"
28580    PRINT "QUESTION.  THERE IS USUALLY AN INSIGHT IN UNDERSTANDING"
28590    PRINT "THESE ROLES.  BY 'GIVES', I MEAN 'IS RESPONSIBLE FOR'."
28600    PRINT "BY 'RECEIVES', I MEAN 'ACCEPTING THE CONSEQUENCES OF'."
28610    GOTO 9960
28620    PRINT "YOU PROBABLY DON'T THINK OF YOURSELF AS AN AUTHORITY."
28630    PRINT "SO PRETEND THAT YOU ARE.  WHAT CREDENTIALS DO YOU THINK A
N"
28640    PRINT "AUTHORITY ON "S$" SHOULD HAVE?"
28650    PRINT "EDUCATION?  POWER?  WEALTH?  COURAGE?  HUMILITY?"
28660    GOTO 9900
28670    PRINT "BEFORE SOMEONE CAN UNDERSTAND "S$","
28680    PRINT "WHAT MATTERS MUST BE UNDERSTOOD BY THEMSELVES."
28690    GOTO 9930
28700    PRINT "BY 'PUBLIC OPINION', I MEAN THE POPULAR POINT OF VIEW."
28710    PRINT "BY 'PRIVATE OPINION', I MEAN THE WAY PEOPLE ACTUALLY BEHA
VE."
28720    PRINT "SOMETIMES, SUCH IRONIC DIFFERENCES HIGHLIGHT THE OLD ADAG
E!"
28730    PRINT "'DO WHAT I SAY, NOT WHAT I DO!'"
28740    PRINT
28750    PRINT "FOR EXAMPLE, MANY FREE AND LIBERAL THINKERS MAY BE MORE"
28760    PRINT "CONSERVATIVE IN MAKING POLITICAL DECISIONS."
28770    GOTO 9960
28780    PRINT "THIS QUESTION IS INTENDED TO FIND OUT WHAT YOU DO NOT"
28790    PRINT "KNOW ABOUT "S$"."
28800    PRINT
28810    PRINT "SO, MAKE A LIST OF THOSE THINGS THAT ARE UNCLEAR -- THE"
28820    PRINT "BEST WAY TO NEW INSIGHTS."
28830    GOTO 9900
28840    PRINT "WHAT ARE THE MOST POPULAR OPINIONS REGARDING"
28850    PRINT S$"?"
28860    PRINT
28870    PRINT "IF THERE WERE AN ELECTION ABOUT THIS TOPIC SOMEHOW,"
28880    PRINT "HOW WOULD THE VOTERS RESPOND?  PRO?  CON?  WHY?"
28890    GOTO 9930
28900    PRINT "THIS QUESTION IS ABOUT CAUSES AND EFFECTS, BUT YOUR ANSWE
R"
28910    PRINT "SHOULD JUST MENTION THE EFFECTS, THE RESULTS, THE"
28920    PRINT "OUTCOMES OF "S$"."
28930    PRINT
28940    PRINT "FOR EXAMPLE, IF I WERE WRITING A PAPER ABOUT EXERCISE,"
28950    PRINT "I WOULD WRITE ABOUT A STRONGER HEART, A NEW FOUND"
28960    PRINT "ALERTNESS, AND ANOTHER WAY TO SPEND MONEY (JOGGING SHOES,
"
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28970   PRINT "TENNIS RACKETS, BICYCLES, WEIGHTS, ETC.)"
28980   GOTO 9960
28990   PRINT "THIS QUESTION IS ABOUT CAUSES AND EFFECTS, BUT YOUR ANSWE
R"
29000   PRINT "SHOULD JUST MENTION THE CAUSES, THE REASONS,"
29010   PRINT "THE 'WHYS' REGARDING "$$"."
29020   PRINT
29030   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT HUMAN RIGHTS PROGRAM
S,"
29040   PRINT "I WOULD WRITE SOMETHING ABOUT THE"
29050   PRINT "OUTRAGES OF RACISM OUR WORLD HAS WITNESSED."
29060   GOTO 9900
29070   PRINT "BY 'RESULTS', I MEAN THE 'EFFECTS',  YOU MAY HAVE TO DIG"
29080   PRINT "UP A LITTLE HISTORY TO ANSWER THIS QUESTION, OR YOU MAY"
29090   PRINT "HAVE TO PREDICT THE FUTURE.  IN OTHER WORDS, CAN THE"
29100   PRINT "FINAL OUTCOMES OF THIS TOPIC BE PREDICTED OVER AND OVER"
29110   PRINT "AGAIN?"
29120   GOTO 9930
29130   PRINT "SIMPLY, WHAT MAKES PEOPLE FEEL THE WAY THEY DO?"
29140   PRINT "MORAL COMMITMENT?  PLEASURE?  FEAR?  PEER PRESSURE?  ETC.
"
29150   GOTO 9960
29160   PRINT "WHAT WOULD IT TAKE FOR MOST PEOPLE TO CHANGE THEIR MINDS"
29170   PRINT "ABOUT "$$"?"
29180   PRINT
29190   PRINT "MOST OF THE ANSWERS TO THIS QUESTION HAVE SOMETHING TO DO
"
29200   PRINT "WITH A PERSON'S DIRECT INVOLVEMENT WITH A SUBJECT LIKE"
29210   PRINT "YOURS, "$$"."
29220   GOTO 9900
29230   PRINT "ARE THE ROOTS OF "$$", FIGURATIVELY"
29240   PRINT "SPEAKING, ALWAYS THE SAME?  LOOKING AT THIS MATTER"
29250   PRINT "ANOTHER WAY:  COULD YOU DESCRIBE DIFFERENT EARLY"
29260   PRINT "SYMPTOMS?  OR IS THERE JUST ONE SYMPTOM?"
29270   GOTO 9930
29280   PRINT "BY 'INCREDIBLE', I MEAN 'UNBELIEVABLE', 'AMAZING',"
29290   PRINT "'BEYOND HUMAN UNDERSTANDING', 'STRANGER THAN FICTION'."
29300   GOTO 9960
29310   PRINT "WHAT ARE SOME OF THE DIFFERENT EXPLANATIONS FOR THE"
29320   PRINT "EXISTENCE OF "$$"?"
29330   PRINT
29340   PRINT "IF THERE ARE NONE, WHY?  IS THERE"
29350   PRINT "REALLY THAT MUCH AGREEMENT??"
29360   GOTO 9900
29370   PRINT "BY 'CONTRADICTIONS', I MEAN 'THOSE MATTERS WHICH DO NOT"
29380   PRINT "BELONG TOGETHER' OR 'KINDS OF IRONY'."
29390   PRINT
29400   PRINT "IN OTHER WORDS, WHAT SHOULDN'T BE THERE, BUT IS?"
29410   PRINT "OR (YOU GUESSED IT), WHAT SHOULD BE A PART OF"
29420   PRINT $$", BUT IS NOT."
29430   GOTO 9930
29440   PRINT "I BET YOU ARE SAYING TO YOURSELF, 'HOW SHOULD I KNOW?'"
29450   PRINT
29460   PRINT "WELL, IF YOU ARE GOING TO WRITE A CONVINCING PAPER ABOUT"
29470   PRINT $$", YOU MUST"
29480   PRINT "FIND OUT AS EARLY AS POSSIBLE THOSE AREAS WHICH NEED TO"
29490   PRINT "BE RESEARCHED.  RIGHT NOW, I'M ASKING YOU TO PREDICT"
29500   PRINT "WHERE YOU CAN FIND SOME MORE FACTS."
29510   GOTO 9960
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29520   PRINT "WHAT PROBLEMS DO YOU HAVE UNDERSTANDING"
29530   PRINT $$" YOURSELF?  BY 'AMBIGUITIES', I"
29540   PRINT "MEAN THOSE MIXED FEELINGS YOU MAY HAVE ABOUT THIS TOPIC."
29550   GOTO 9900
29560   PRINT "BY 'BETTER COURSE', I MEAN FOR YOU TO SUGGEST A BETTER"
29570   PRINT "SOLUTION TO ANY PROBLEMS ASSOCIATED WITH"
29580   PRINT $$","
29590   PRINT
29600   PRINT "IF YOU EXPECT PEOPLE TO BE CONVINCED BY YOUR ARGUMENT,"
29610   PRINT "YOU MUST OFFER THEM A SOUND SOLUTION."
29620   GOTO 9930
29630   PRINT "IF PEOPLE WERE NO LONGER CONCERNED ABOUT"
29640   PRINT $$", WOULD THAT BE"
29650   PRINT "THE WORST THING THAT COULD HAPPEN?  WHY OR WHY NOT?"
29660   GOTO 9960
29670   PRINT "IF EVERYONE IN THE WORLD WAS AS CONCERNED ABOUT"
29680   PRINT $$" AS YOU ARE,"
29690   PRINT "WOULD THAT BE THE BEST THING THAT COULD HAPPEN?"
29700   PRINT "WHY OR WHY NOT?"
29710   GOTO 9900
29720   PRINT "SIMPLY, WHAT WAS BEEN WRONG WITH THE WAY"
29730   PRINT $$" WAS BEEN HANDLED."
29740   PRINT "MAYBE 'MISTAKE' IS TOO HARSH A TERM; 'MISTREATMENT' MAY"
29750   PRINT "BE BETTER FOR THIS TOPIC."
29760   GOTO 9900
29770   PRINT "IF I SAY 'BLACK', YOU SAY 'WHITE',"
29780   PRINT "IF I SAY 'HEADACHE', YOU SAY 'ASPIRIN',"
29790   PRINT
29800   PRINT "NOW, "N1$", IF I SAY "$$","
29810   PRINT "WHAT DO YOU SAY?"
29820   GOTO 9930
29830   PRINT "BY 'INCONSISTENT', I MEAN TO SUGGEST THOSE MATTERS"
29840   PRINT "WHICH SEEM 'OUT OF PLACE.'"
29850   PRINT
29860   PRINT "'INCONSISTENT' MAY ALSO SUGGEST THAT SOME THINGS ABOUT"
29870   PRINT $$" CHANGE MORE OFTEN"
29880   PRINT "THAN OTHER THINGS,  WHAT MIGHT THEY BE?"
29890   GOTO 9960
29900   PRINT    'PROMPTERS AFTER CLARIFICATION
29910   PRINT,"TRY ANSWERING THIS QUESTION NOW,"
29920   GOTO 5050
29930   PRINT
29940   PRINT,"WHAT ARE YOU THINKING NOW, "N1$"?"
29950   GOTO 5050
29960   PRINT
29970   PRINT,"YOUR TURN, "N1$","
29980   GOTO 5050
29990   PRINT    'SECOND RESPONSE AFTER CLARIFICATION REQUEST
10000   PRINT "THAT'S ABOUT ALL I CAN ADD AT THE MOMENT.  SORRY!"
10010   GOTO 9930
10020   REM   <<<   CLOSING SEQUENCES   >>>
10030   IF C<3 THEN 10200
10040   IF C<7 THEN 10290
10050   PRINT
10060   PRINT
10070   PRINT,"YOU EXPLORED"E3"QUESTIONS OUT OF THE"C"I ASKED,"
10080   PRINT,"THAT'S"(E3/C)*100"PERCENT."
10090   PRINT
10100   PRINT,"LET ME REMIND YOU THAT YOU ARE STILL IN THE FIRST STAGES"
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10110   PRINT,"OF THE CREATIVE PROCESS.  THESE IDEAS MUST SIMMER NO~."
10120   PRINT
10130   PRINT,"ALSO, I HOPE YOU CAN CREATE SOME OF YOUR OWN 'TOPIC'"
10140   PRINT,"QUESTIONS.  I WON'T ALWAYS BE AROUND TO HELP!!!"
10150   PRINT
10160   PRINT,,"HOPE YOUR PAPER IS TERRIFIC!"
10170   PRINT
10180   PRINT,,"GOOD BYE & GOOD LUCK;"
10190   STOP
10200   PRINT
10210   PRINT
10220   PRINT,"~HY, "N1$", YOU ARE IN A HURRY TODAY."
10230   PRINT
10240   PRINT,"YOU ~ILL NEED TO SPEND MORE TIME THINKING ABOUT"
10250   PRINT,S$"."
10260   PRINT
10270   PRINT,"SORRY I COULD NOT HELP YOU MORE,  BYE."
10280   STOP
10290   PRINT
10300   PRINT
10310   PRINT,"YOU ARE DEFINITELY A DEEP THINKER, "N1$"."
10320   PRINT
10330   PRINT,"YOU ~ERE ASKED"C"QUESTIONS AND FULLY EXPLORED"
10340   PRINT,E3"OF THEM."
10350   PRINT
10360   PRINT,"PLEASE COME BACK AGAIN ~HEN YOU CAN STAY LONGER."
10370   PRINT
10380   PRINT,,"GOOD-BYE."
10390   END
```

```
10010   REM   <<<   INVENTION PROGRAM:  BURKE'S DRAMATISTIC PENTAD   >>>
10020   REM   <<<   AUTHOR:  HUGH BURNS   >>>
10021   REM   <<<   THIS PROGRAM MAY BE USED ONLY WITH THE AUTHOR'S PERM
ISSION,
10022   REM   USE WITHOUT DIRECT PERMISSION VIOLATES COPYRIGHT LAW,   >>
>

10030   RANDOMIZE
10040   DIM Z(50)
10050   Z(0)=4
10060   DIM X(50)
10070   X(R)=0
10080   E=C=0=Q8=E3=L4=N8=S8=A8=G8=V8=P8=0   'COUNTERS
10090   PRINT
10100   PRINT
10110   PRINT
10120   PRINT
10130   PRINT
10140   PRINT,"A COMPUTER-ASSISTED INVENTION PROGRAM:"
10150   PRINT,"--------------------------------------"
10160   PRINT
10170   PRINT,"      BURKE'S DRAMATISTIC PENTAD"
10180   PRINT,"      -------------------------"
10190   PRINT
10200   PRINT
10210   PRINT
10220   PRINT
10230   PRINT,"GREETINGS!  WELCOME TO CAI-PROMPTED INVENTION,"
10240   PRINT
10250   PRINT "PLEASE TYPE IN YOUR FIRST NAME:  ";
10260   LINPUT N1$
10270   IF N1$="" THEN 260
10280   PRINT
10290   PRINT "NOW, "N1$", PLEASE TYPE IN YOUR LAST NAME:  ";
10300   LINPUT N2$
10310   IF N2$="" THEN 300
10312   IF N2$="TEST!" THEN 3590
10320   PRINT
10330   PRINT "THANK YOU, "N1$" "N2$",  I HOPE I CAN BE OF SOME"
10340   PRINT "ASSISTANCE TO YOU TODAY.  IF WE TAKE EACH OTHER SERIOUSLY
,"
10350   PRINT "I KNOW YOU'LL THINK ABOUT YOUR TOPIC AS YOU NEVER HAVE BE
FORE,"
10360   PRINT
10370   PRINT,"BEFORE WE BEGIN, "N1$", THERE'S AN OLD"
10380   PRINT "SAYING ABOUT COMPUTER-ASSISTED INSTRUCTION.  IT GOES:"
10390   PRINT
10400   PRINT,"'GARBAGE IN, GARBAGE OUT!'"
10410   PRINT
10420   PRINT "IN OTHER WORDS, YOU AND I HAVE GOT TO WORK TOGETHER SO"
10430   PRINT "YOU CAN GET A GOOD START ON YOUR RESEARCH PAPER,"
10440   PRINT
10450   PRINT
10460   PRINT
10470   PRINT
10480   PRINT,"(PRESS 'RETURN' TO CONTINUE.)"
10490   PRINT
10500   LINPUT A$
10510   PRINT
10520   PRINT
```

```
30530   PRINT
30540   PRINT "WOULD YOU LIKE TO REVIEW THE DIRECTIONS AND COMMANDS?"
30550   PRINT,"(YES OR NO?)"
30560   INPUT A$
30570   GOSUB 6590
30580   IF K1=1 THEN 600
30590   GOTO 1670
30600   REM    <<<   DIRECTIONS   >>>
30610   PRINT
30620   PRINT
30630   PRINT,"DIRECTIONS:"
30640   PRINT
30650   PRINT
30660   PRINT,"1.  WHEN YOU MAKE A TYPING ERROR, "WIS", AND"
30670   PRINT,"WISH TO CORRECT IT, USE THE 'RUBOUT' OR 'RUB'."
30680   PRINT,"THE 'SHIFT' MUST BE DEPRESSED WHEN YOU 'RUBOUT'."
30690   PRINT,"IT MAY LOOK A LITTLE FUNNY (LIKE WRITING BACKWARDS),"
30700   PRINT,"BUT DON'T WORRY; IT WORKS THAT WAY."
30710   PRINT
30720   PRINT,"     (NOTE:  SPELLING IS NOT CRUCIAL TO INVENTION.)"
30730   PRINT
30740   PRINT
30750   PRINT,"2.  REMEMBER THAT I CAN ONLY READ ABOUT A LINE AND"
30760   PRINT,"A HALF OF INFORMATION AT ONE TIME -- ABOUT THIS MUCH:"
30770   PRINT
30780   PRINT "-------------------------------------------------------
-----------------------------------------"
30790   PRINT
30800   PRINT,"HIT 'RETURN' AT THAT POINT AND I'LL GENERALLY"
30810   PRINT,"LET YOU ADD MORE INFORMATION.  IF THAT DOES NOT WORK,"
30820   PRINT,"TYPE '&&' AND I'LL SAY 'GO ON, "WIS".""
30830   PRINT
30840   PRINT,,"(PRESS 'RETURN' TO CONTINUE.)"
30850   LINPUT A$
30860   PRINT
30870   PRINT
30880   PRINT
30890   PRINT,"3.  AFTER YOU FINISH TYPING YOUR RESPONSE, YOU MUST PRESS
"
30900   PRINT,"THE 'RETURN' KEY."
30910   PRINT
30920   PRINT
30930   PRINT
30940   PRINT,"4.  THE MOST IMPORTANT OBJECTIVE OF THIS PROGRAM"
30950   PRINT,"IS TO GET YOU THINKING ABOUT YOUR TOPIC."
30960   PRINT
30970   PRINT,"IN ORDER TO ACHIEVE THIS OBJECTIVE,"
30980   PRINT,"YOU SHOULD FORGET THAT I AM A MACHINE."
30990   PRINT
31000   PRINT,"PLEASE ASK QUESTIONS.  I'M NOT GUARANTEEING CONTENT"
31010   PRINT,"-ORIENTED RESPONSES, OR EVEN THE TRUTH, BUT I'LL DO"
31020   PRINT,"THE BEST I CAN."
31030   PRINT
31040   PRINT
31050   PRINT
31060   PRINT,,"(PRESS 'RETURN' TO CONTINUE.)"
31070   PRINT
31080   PRINT
31490   LINPUT A$
```

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01100   PRINT
01110   PRINT
01120   PRINT
01130   PRINT
01140   PRINT "COMMANDS:","TYPE IN-->","I'LL DO THIS-->"
01150   PRINT,"----------","---------------"
01160   PRINT
01170   PRINT,"STOP!","I'LL STOP ASKING QUESTIONS AND CLOSE."
01180   PRINT
01190   PRINT,"CONTINUE!","I'LL SKIP AHEAD TO THE NEXT QUESTION."
01200   PRINT
01210   PRINT,"REPEAT!","I'LL REPEAT THE QUESTION."
01220   PRINT
01230   PRINT,"DIRECTIONS!","I'LL SHOW YOU THESE DIRECTIONS."
01240   PRINT
01250   PRINT,"CHANGE!","I'LL LET YOU CHANGE YOUR SUBJECT."
01260   PRINT
01270   PRINT,"?","I'LL LET YOU ASK A QUESTION."
01280   PRINT
01290   PRINT,"EXPLAIN!","I'LL EXPLAIN THE QUESTION."
01300   PRINT
01310   PRINT,"SCENE!","I'LL ASK YOU A 'SCENE' QUESTION."
01320   PRINT,,"ALSO, I'LL LET YOU ASK FOR 'ACT',"
01330   PRINT,,"'AGENT', 'AGENCY', AND 'PURPOSE',"
01340   PRINT
01350   PRINT,"&&","I'LL LET YOU CONTINUE WITH YOUR RESPONSE."
01360   PRINT
01370   PRINT,,"(PRESS 'RETURN' TO CONTINUE.)";
01380   LINPUT A$
01390   PRINT
01400   PRINT
01410   PRINT
01420   PRINT
01430   PRINT
01440   PRINT,"TWO LAST THINGS:"
01450   PRINT
01460   PRINT,"1.  THINK OF ME AS A PERSON WHO CAN ASK A LOT OF GOOD"
01470   PRINT,"QUESTIONS."
01480   PRINT
01490   PRINT,"2.  SCREAM FOR HELP IF I START ACTING REALLY CRAZY!!"
01500   PRINT
01510   PRINT
01520   PRINT
01530   PRINT
01540   PRINT
01550   PRINT
01560   PRINT
01570   PRINT
01580   PRINT
01590   IF J=1 THEN 1610
01600   GOTO  1720
01610   PRINT,"BACK TO THE QUESTIONS, "N1$"   --->   --->   --->"
01620   PRINT
01630   PRINT
01640   PRINT
01650   PRINT,,"BUT FIRST, IS THERE"
01660   GOTO 7910
01670   PRINT
01680   PRINT
01690   PRINT
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01700   PRINT "WOULD YOU LIKE TO REVIEW KENNETH BURKE'S PENTAD?"
01710   PRINT,"(YES OR NO?)"
01720   J$="YES"
01730   GOSUB 6590
01740   IF K1=1 THEN 1760
01750   GOTO 2020
01760   REM   <<<   PENTAD DESCRIPTION   >>>
01770   PRINT
01780   PRINT
01790   PRINT,"BRIEFLY, KENNETH BURKE'S DRAMATISTIC PENTAD"
01800   PRINT "ENCOURAGES A WRITER TO THINK ABOUT A SUBJECT FROM FIVE"
01810   PRINT "PERSPECTIVES."
01820   PRINT
01830   PRINT,"1.  SCENE","WHERE AND WHEN SOMETHING HAPPENS."
01840   PRINT
01850   PRINT,"2.  ACT","WHAT HAPPENS."
01860   PRINT
01870   PRINT,"3.  AGENT","WHO CAUSES WHAT HAPPENS TO HAPPEN."
01880   PRINT
01890   PRINT,"4.  AGENCY","BY WHAT MEANS DOES SOMETHING HAPPEN."
01900   PRINT
01910   PRINT,"5.  PURPOSE","WHY SOMETHING HAPPENS."
01920   PRINT
01930   PRINT "BURKE ALSO ENCOURAGES WRITERS TO SEE THE RELATIONSHIPS"
01940   PRINT "AMONG THESE PERSPECTIVES.  HE CALLS THESE RELATIONSHIPS,"
01950   PRINT "THE RATIOS."
01960   PRINT
01970   PRINT
01980   PRINT
01990   PRINT
02000   PRINT,,"(HIT 'RETURN' TO CONTINUE)"
02010   LINPUT A$
02020   REM   <<<   SUBJECT SEQUENCE   >>>
02030   PRINT
02040   PRINT
02050   PRINT
02060   PRINT
02070   PRINT
02080   PRINT
02090   PRINT
02100   PRINT
02110   PRINT
02120   PRINT
02130   PRINT,"NOW I NEED TO FIND OUT WHAT YOU"
02140   PRINT "ARE WRITING ABOUT, SO WOULD YOU PLEASE TYPE IN YOUR"
02150   PRINT "SUBJECT.  I AM LOOKING FOR ONE TO THREE WORDS."
02160   PRINT
02170   PRINT
02180   PRINT
02190   PRINT
02200   PRINT
02210   PRINT
02220   PRINT,!
02230   LINPUT S$
02240   IF S$="" THEN 2220
02250   IF LEN(S$)<40 THEN 2280
02260   PRINT
02270   PRINT "THAT'S A MOUTHFUL, "N1$".  MAKE IT SHORTER--LIKE A TITLE.
02280   PRINT,"HERE ARE A FEW EXAMPLES:"
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02290   PRINT
02300   PRINT
02310   PRINT,"     *  HUMAN RIGHTS"
02320   PRINT,"     *  INFLATION"
02330   PRINT,"     *  GLASS BLOWING IN MEXICO"
02340   PRINT
02350   PRINT
02360   PRINT,"YOUR TURN.  WHAT IS YOUR SUBJECT?"
02370   PRINT
02380   PRINT
02390   GOTO 2220
02400   IF NA$=0 THEN 2420
02410   GOTO 2513
02420   PRINT
02430   PRINT "YOUR REVISED SUBJECT IS "$$"."
02440   PRINT
02450   PRINT
02460   PRINT
02470   PRINT
02480   PRINT
02490   PRINT
02500   GOTO 8090
02510   J=INT(3*RND(1))
02520   ON J GOTO 2530,2570,2610
02530   PRINT   "INFORMAL ACKNOWLEDGEMENT OF SUBJECT"
02540   PRINT "REALLY!  WHAT A COINCIDENCE--I ONCE READ A"
02550   PRINT "BOOK ABOUT "$$"."
02560   GOTO 2650
02570   PRINT
02580   PRINT "HEY, THAT'S NEAT, "N1$"!  WE'LL ENJOY EXPLORING"
02590   PRINT $$"."
02600   GOTO 2650
02610   PRINT
02620   PRINT "BE SURE TO ASK THE REFERENCE LIBRARIAN ABOUT THE RECENT"
02630   PRINT "RESEARCH ON "$$".  YOU'LL BE"
02640   PRINT "WELL-REWARDED."
02650   PRINT
02660   PRINT,,"(HIT 'RETURN' TO CONTINUE.)"
02670   LINPUT A$
02680   REM   <<<   PURPOSE SEQUENCE   >>>
02690   PRINT
02700   PRINT
02710   PRINT
02720   PRINT
02730   PRINT,"A COMMENT ABOUT YOUR PURPOSE!"
02740   PRINT
02750   PRINT
02760   PRINT
02770   PRINT,"DURING THIS EXPLORATION PROCESS,"
02780   PRINT,"YOU WILL BE ASKED TO CLARIFY THE PURPOSE OF"
02790   PRINT,"YOUR PAPER ON "$$"."
02800   PRINT
02810   PRINT
02820   PRINT,"SO HOW WOULD YOU BRIEFLY DESCRIBE THE PURPOSE"
02830   PRINT,"OF YOUR PAPER BY COMPLETING THIS STATEMENT?"
02840   PRINT
02850   PRINT "THE PURPOSE OF MY PAPER IS TO. . . ."
02851   PRINT,"(ONE LINE LIMIT, PLEASE!)"
02860   PRINT
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 2870   PRINT
 2880   PRINT
 2890   PRINT
 2900   PRINT
 2910   PRINT
 2920   PRINT
 2930   LINPUT P$
 2940   IF P$="" THEN 2930
 2950   PRINT
 2951   GOSUB 3581
 2960   PRINT
 2970   PRINT,"FINE, "N1$", YOU AND I WILL TALK AGAIN ABOUT YOUR"
 2980   PRINT,"PURPOSE."
 2990   PRINT
 3000   PRINT
 3010   GOTO 3590
 3020   PRINT   "PURPOSE SEQUENCE AT C=1=6
 3030   PRINT
 3040   PRINT,"BEFORE WE CONTINUE, "N1$", I WANT YOU"
 3050   PRINT,"TO THINK ABOUT YOUR PURPOSE ONCE AGAIN."
 3060   PRINT
 3070   PRINT "YOU HAVE ALREADY TOLD ME THAT YOUR PURPOSE WAS"
 3080   PRINT "TO "P$"."
 3090   PRINT
 3100   PRINT
 3110   PRINT,"NOW HOW WOULD YOU COMPLETE THIS STATEMENT?"
 3120   PRINT
 3130   PRINT,"IF NOTHING ELSE, I WANT MY READER TO UNDERSTAND. . . ."
 3131   PRINT,"(LIMIT: ONE LINE)"
 3140   PRINT
 3150   PRINT
 3160   LINPUT P1$
 3170   IF P1$="" THEN 3160
 3180   PRINT
 3181   GOSUB 3581
 3190   PRINT "OKAY, GOOD.  KEEP PURPOSE IN MIND AS WE CONTINUE."
 3200   IF S9=1 THEN 4220
 3210   IF A9=1 THEN 4360
 3220   IF G9=1 THEN 4510
 3230   IF Y9=1 THEN 4660
 3240   IF P9=1 THEN 4810
 3250   PRINT
 3260   PRINT
 3270   PRINT
 3280   PRINT,"HERE IS YOUR NEXT QUESTION -- NUMBER"C=1"."
 3290   PRINT
 3300   IF C>5 THEN 3020
 3310   Z(3)=Z(4)=Z(5)=Z(6)=Z(7)=Z(8)=Z(9)=Z(10)=0   'RESET POOL
 3320   X(3)=X(4)=X(5)=X(6)=X(7)=X(8)=X(9)=X(10)=0   'RESET CLARIFICATIO
N
 3330   GOTO 3020
 3340   PRINT   "PURPOSE SEQUENCE AT C=1=12
 3350   IF N8>0 THEN 3280
 3360   PRINT
 3370   PRINT,"LET'S PAUSE ONCE AGAIN TO CONSIDER YOUR INTENT."
 3380   PRINT
 3390   PRINT,"YOUR GENERAL PURPOSE IS TO"
 3400   PRINT P$"."
 3410   PRINT
 3420   PRINT,"ALSO, YOU WANT YOUR READER TO UNDERSTAND"
```

```
03430   PRINT P1$","
03440   PRINT
03450   PRINT "IS THERE ANYTHING ELSE YOU WISH TO SAY ABOUT YOUR PURPOSE
?"
03460   PRINT,"(YES OR NO?)"
03470   J$="YE"
03480   GOSUB 6590
03490   IF K1=1 THEN 3530
03500   PRINT
03510   PRINT,"FINE, "N1$", ENOUGH ABOUT YOUR PURPOSE."
03520   GOTO 3200
03530   PRINT
03540   PRINT,"GREAT, "N1$", WHAT WOULD YOU LIKE TO ADD?"
03541   PRINT,"(ONE LINE LIMIT IN EFFECT)"
03550   PRINT
03560   LINPUT P2$
03570   IF P2$="" THEN 3560
03571   GOSUB 3581
03580   GOTO 3180
03581   PRINT
03582   PRINT,"ANY MONEY"
03583   PRINT,"(IF SO, TYPE WHATEVER IT IS; IF NOT, TYPE 'NO',)"
03584   PRINT
03585   LINPUT A$
03586   PRINT
03587   RETURN
03590   PRINT   'PAGING QUESTION SEQUENCE
03600   PRINT
03610   PRINT
03620   PRINT
03630   PRINT
03640   PRINT
03650   PRINT
03660   PRINT
03670   PRINT
03680   PRINT
03690   PRINT
03700   PRINT,"RELAX NOW, "N1$", AND ENJOY THIS EXPLORATION OF"
03710   PRINT,S3$,"."
03720   PRINT
03730   PRINT
03740   PRINT
03750   PRINT
03760   PRINT
03770   PRINT
03780   PRINT
03790   PRINT
03800   PRINT
03810   REM   <<<   COUNTER/EXPLORATION CONTROLS   >>>
03820   C=C+1
03830   E=L+Q8+Q6+S9+A9+G9+Y9+P9+8
03840   IF C>50 THEN 12440'POOL EXHAUSTED--AUTO-CLOSE
03850   IF C>5 THEN 4200'OPENS TOTAL POOL
03860   Z=0+A1=INT(10+RND+1)   'RESTRICTS POOL FOR FULL CLARIFICATION
03870   IF Z(Z)=1 THEN 3860
03880   Z(Z)=1
03890   ON Z GOTO 3900,3900,3920,3920,3940,3940,3960,3960,3980,3980
03900   S8=S8+1
03910   GOTO 4050
```

```
 3920   A8=A8+1
 3930   GOTO 4960
 3940   G8=G8+1
 3950   GOTO 4970
 3960   Y8=Y8+1
 3970   GOTO 4980
 3980   P8=P8+1
 3990   GOTO 4990
 4000   Q=R=R1=INT(5W*RND+1)
 4010   IF Z(Q)=1 THEN 4000
 4020   Z(Q)=1
 4030   IF Q<11 THEN 3900'SCENE (S)
 4040   IF Q<21 THEN 4000'ACT (A)
 4050   IF Q<31 THEN 4100'AGENT (G)
 4060   IF Q<41 THEN 4120'AGENCY (Y)
 4070   IF Q<51 THEN 4140'PURPOSE (P)
 4080   Q=Q-10
 4090   GOTO 3920
 4100   Q=Q-20
 4110   GOTO 3940
 4120   Q=Q-30
 4130   GOTO 3960
 4140   Q=Q-40
 4150   GOTO 3980
 4160   REM   <<<   PENTAD SUBJECT-CONTROLLED BRANCHING   >>>
 4170   S9=1    'REMEMBERS SCENE REQUEST IF ROUTED
 4180   C=C+1
 4190   IF C=6 THEN 3020
 4200   IF C=12 THEN 3340
 4210   IF C>50 THEN 12040
 4220   IF S8>9 THEN 4910
 4230   A9=G9=Y9=P9=E=L4=Q8=Q6=0
 4240   Q=R=R1=INT(10*RND+1)
 4250   IF Z(Q)=1 THEN 4240
 4260   Z(Q)=1
 4270   PRINT
 4280   PRINT "HERE IS QUESTION";C;"FROM THE 'SCENE' PERSPECTIVE:"
 4290   PRINT
 4300   GOTO 3980
 4310   A9=1    'REMEMBERS ACT REQUEST IF ROUTED
 4320   C=C+1
 4330   IF C=6 THEN 3020
 4340   IF C=12 THEN 3340
 4350   IF C>50 THEN 12040
 4360   IF A8>9 THEN 4910
 4370   S9=G9=Y9=P9=E=L4=Q8=Q6=0
 4380   Q=R=R1=INT(20*RND+1)
 4390   IF Z<11 THEN 4380
 4400   IF Z(Q)=1 THEN 4380
 4410   Z(Q)=1
 4420   PRINT
 4430   PRINT "HERE IS QUESTION";C;"FROM THE 'ACT' PERSPECTIVE:"
 4440   PRINT
 4450   GOTO 4980
 4460   G9=1    'REMEMBERS AGENT REQUEST IF ROUTED
 4470   C=C+1
 4480   IF C=6 THEN 3020
 4490   IF C=12 THEN 3340
 4500   IF C>50 THEN 12040
```

```
24510   IF Q8>0 THEN 4910
24520   S9=A9=Y9=P9=E=L4=Q8=Q6=0
24530   J=R=R1=INT(30*RND+1)
24540   IF J<21 THEN 4530
24550   IF Z(J)=1 THEN 4530
24560   Z(J)=1
24570   PRINT
24580   PRINT "HERE IS QUESTION";C;"FROM THE 'AGENT' PERSPECTIVE:"
24590   PRINT
24600   GOTO 4100
24610   Y9=1    'REMEMBERS AGENCY REQUEST IF ROUTED
24620   C=C+1
24630   IF C=6 THEN 3020
24640   IF C=12 THEN 3340
24650   IF C>50 THEN 12640
24660   IF Y8>0 THEN 4910
24670   S9=A9=G9=P9=E=L4=Q8=Q6=0
24680   J=R=R1=INT(40*RND+1)
24690   IF J<31 THEN 4600
24700   IF Z(J)=1 THEN 4600
24710   Z(J)=1
24720   PRINT
24730   PRINT "HERE IS QUESTION";C;"FROM THE 'AGENCY' PERSPECTIVE!"
24740   PRINT
24750   GOTO 4120
24760   P9=1    'REMEMBERS PURPOSE REQUEST IF ROUTED
24770   C=C+1
24780   IF C=6 THEN 3020
24790   IF C=12 THEN 3340
24800   IF C>50 THEN 12640
24810   IF P8>0 THEN 4910
24820   S9=A9=Y9=G9=E=L4=Q8=Q6=0
24830   J=R=R1=INT(50*RND+1)
24840   IF J<41 THEN 4830
24850   IF Z(J)=1 THEN 4830
24860   Z(J)=1
24870   PRINT
24880   PRINT "HERE IS QUESTION";C;"FROM THE 'PURPOSE' PERSPECTIVE:"
24890   PRINT
24900   GOTO 4140
24910   PRINT   'PARTICULAR POOL EXHAUSTED
24920   PRINT "SORRY, "N1$",  NO MORE QUESTIONS LEFT HERE,  WHAT NOW?"
24930   L=1
24940   GOTO 6760
24950   ON J GOTO 5020,5040,5070,5100,5130,5160,5190,5220,5250,5280
24960   ON J GOTO 5320,5340,5360,5400,5440,5460,5480,5510,5540,5570
24970   ON J GOTO 5610,5640,5670,5710,5740,5780,5820,5850,5880,5910
24980   ON J GOTO 5950,5990,6020,6050,6080,6110,6140,6180,6220,6240
24990   ON J GOTO 6280,6300,6320,6350,6380,6410,6440,6470,6500,6540
25000   REM   <<<   QUESTION POOL FOR BURKE'S PENTAD   >>>
25010   REM   <<<   SCENE QUESTIONS   >>>
25020   PRINT "WHERE DOES "S$" OCCUR?  DESCRIBE."
25030   GOTO 6750
25040   PRINT "WHAT IS THE SETTING FOR "S$"?"
25050   PRINT "DESCRIBE."
25060   GOTO 6750
25070   PRINT "WHAT IS THE BACKGROUND FOR "S$"?"
25080   PRINT "EXPLAIN."
25090   GOTO 6750
```

```
25100   PRINT "WHAT PARTICULARS OF THE SETTING INFLUENCE"
25110   PRINT $$"?  DESCRIBE,"
25120   GOTO 6750
25130   PRINT "IS THE SETTING AROUND "$$" UNIQUE?"
25140   PRINT "WHAT MAKES IT SO?"
25150   GOTO 6750
25160   PRINT "DOES THE SETTING FOR "$$" REMIND YOU"
25170   PRINT "OF SOMETHING IN YOUR OWN EXPERIENCE?  WHY OR WHY NOT?"
25180   GOTO 6750
25190   PRINT "IS THE SETTING OF "$$" GOOD, BAD,"
25200   PRINT "OR INDIFFERENT?  EXPLAIN,"
25210   GOTO 6750
25220   PRINT "ARE SOME IMPORTANT ASPECTS OF THE SETTING OF"
25230   PRINT $$" IGNORED BY PEOPLE?  WHY OR WHY NOT?"
25240   GOTO 6750
25250   PRINT "WHAT WOULD BE THE IDEAL SETTING FOR"
25260   PRINT $$"?  DESCRIBE,"
25270   GOTO 6750
25280   PRINT "WHAT IMPRESSES PEOPLE ABOUT THE SETTING FOR"
25290   PRINT $$"?  DESCRIBE,"
25300   GOTO 6750
25310   REM   <<<   ACT QUESTIONS   >>>
25320   PRINT "WHAT HAPPENS IN "$$"?  DESCRIBE,"
25330   GOTO 6750
25340   PRINT "WHAT CAUSES "$$"?  EXPLAIN,"
25350   GOTO 6750
25360   PRINT "DESCRIBE OR LIST WHAT OTHERS MAY NOT KNOW"
25370   PRINT "ABOUT "$$","
25380   Z(13)=1
25390   GOTO 6750
25400   PRINT "DESCRIBE SOCIETY'S ATTITUDE TOWARD"
25410   PRINT $$","
25420   Z(14)=1
25430   GOTO 6750
25440   PRINT "HOW IS "$$" LIKE A RAINBOW, "N1$"?"
25450   GOTO 6750
25460   PRINT "WHAT ARE THE CONSEQUENCES OF "$$"?"
25470   GOTO 6750
25480   PRINT "WHAT AUTHORITIES KNOW ABOUT "$$"?"
25490   PRINT "ARE THEY RELIABLE?"
25500   GOTO 6750
25510   PRINT "HOW SHOULD PEOPLE BEHAVE OR ACT TODAY CONSIDERING"
25520   PRINT $$"?"
25530   GOTO 6750
25540   PRINT "DESCRIBE THE INHERENT CRISIS IN "$$"?"
25550   PRINT "IN OTHER WORDS, WHAT IS THE MAIN PROBLEM?"
25560   GOTO 6750
25570   PRINT "DESCRIBE HOW "$$" IS A CUSTOM OR"
25580   PRINT "A HABIT OF THINKING,"
25590   GOTO 6750
25600   REM   <<<   AGENT QUESTIONS   >>>
25610   PRINT "WHO IS INVOLVED WITH "$$"?"
25620   PRINT "HOW INVOLVED?  EXPLAIN,"
25630   GOTO 6750
25640   PRINT "HOW ARE PEOPLE CONSCIOUSLY OR UNCONSCIOUSLY INVOLVED"
25650   PRINT "WITH "$$"?"
25660   GOTO 6750
25670   PRINT "DESCRIBE THE FEELINGS OF THOSE PEOPLE WHO ARE INVOLVED"
25680   PRINT "WITH "$$",  WHAT"
25690   PRINT "SENSIBILITIES DO THEY SHARE?"
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25700   GOTO 6750
25710   PRINT "WHAT AUDIENCE WOULD MOST APPRECIATE KNOWING MORE"
25720   PRINT "ABOUT "SS"?"
25730   GOTO 6750
25740   PRINT "WHO ESPECIALLY THINKS ABOUT "SS"?"
25750   PRINT "WHY?  EXPLAIN."
25760   Z(25)=1
25770   GOTO 6750
25780   PRINT "WHO ESPECIALLY CARES ABOUT "SS"?"
25790   PRINT "EXPLAIN THEIR REASONS."
25800   Z(26)=1
25810   GOTO 6750
25820   PRINT "ARE THE PEOPLE INVOLVED WITH "SS
25830   PRINT "FOR CHANGE OR NOT?  EXPLAIN."
25840   GOTO 6750
25850   PRINT "WHAT ATTITUDES DO PEOPLE HAVE TOWARD"
25860   PRINT SS"?  EXPLAIN."
25870   GOTO 6750
25880   PRINT "DO THE PEOPLE INVOLVED WITH "SS""
25890   PRINT "AGREE?  EXPLAIN ANY SIGNIFICANT DIFFERENCES."
25900   GOTO 6750
25910   PRINT "MAKE A SHORT LIST OF POINTS OF VIEW ABOUT"
25920   PRINT SS",  PRO?  CON?  INDIFFERENT?  IGNORANT?"
25930   GOTO 6750
25940   REM   <<<   AGENCY QUESTIONS   >>>
25950   PRINT "DESCRIBE THE PROCESSES USED IN "SS"."
25960   PRINT "YOU MAY WANT ME TO EXPLAIN,  IF SO, TYPE 'EXPLAIN!'"
25970   PRINT "(REMEMBER THE EXCLAMATION POINT!!!)"
25980   GOTO 6750
25990   PRINT "COMPLETE:  IF THE ENDS OF "SS
26000   PRINT "ARE _____, THE MEANS ARE _____."
26010   GOTO 6750
26020   PRINT "HOW IS "SS" LIKE MERCURY
26030   PRINT "IN A THERMOMETER?  EXPLAIN."
26040   GOTO 6750
26050   PRINT "WHAT PROPS OR DEVICES ARE USED IN"
26060   PRINT SS"?  DESCRIBE."
26070   GOTO 6750
26080   PRINT "WHAT PSYCHOLOGICAL OR HISTORICAL CAUSES HELP"
26090   PRINT "CREATE "SS"?  HOW SO?"
26100   GOTO 6750
26110   PRINT "WHAT ECONOMIC OR POLITICAL CAUSES HELP CREATE"
26120   PRINT SS"?  DESCRIBE."
26130   GOTO 6750
26140   PRINT "WHAT CULTURAL OR SOCIOLOGICAL CAUSES HELP"
26150   PRINT "CREATE "SS"?  ELABORATE."
26160   Z(37)=1
26170   GOTO 6750
26180   PRINT "HOW CAN EDUCATION BE AN IMPORTANT TOOL IN"
26190   PRINT SS"?  EXPLAIN."
26200   Z(38)=1
26210   GOTO 6750
26220   PRINT "HOW DOES MONEY AFFECT "SS"?"
26230   GOTO 6750
26240   PRINT "WHAT TOOLS, WEAPONS, INSTRUMENTS DO YOU NEED TO CHANGE"
26250   PRINT "ATTITUDES ABOUT "SS"?  DESCRIBE."
26260   GOTO 6750
26270   REM   <<<   PURPOSE QUESTIONS   >>>
26280   PRINT "WHAT PURPOSES DOES "SS" HAVE?"
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26290   GOTO 6750
26300   PRINT "WHAT IS THE ULTIMATE GOAL OF "S$"?"
26310   GOTO 6750
26320   PRINT "HOW HAVE THE PURPOSES OF "S$" BEEN"
26330   PRINT "CHANGED?  DESCRIBE."
26340   GOTO 6750
26350   PRINT "DOES EVERYONE AGREE THAT "S$" HAS"
26360   PRINT "THE SAME PURPOSE?  EXPLAIN ANY DIFFERENCES."
26370   GOTO 6750
26380   PRINT "WHAT PREDICTIONS CAN YOU MAKE ABOUT"
26390   PRINT S$"?  ELABORATE."
26400   GOTO 6750
26410   PRINT "HOW IS THE PURPOSE OF "S$
26420   PRINT "LIKE A BEGINNING.  I'LL EXPLAIN IF YOU TYPE 'EXPLAIN;'"
26430   GOTO 6750
26440   PRINT "HOW IS THE PURPOSE OF "S$" PART"
26450   PRINT "OF A LARGER PURPOSE?  DESCRIBE THIS LARGER PURPOSE."
26460   GOTO 6750
26470   PRINT "WHAT REASONS CAN YOU LIST FOR THE EXISTENCE"
26480   PRINT "OF "S$"?"
26490   GOTO 6750
26500   PRINT "WHAT SOLUTIONS COULD YOU RECOMMEND FOR ANY PROBLEMS"
26510   PRINT "CAUSED BY "S$"?"
26520   Z(49)=1
26530   GOTO 6750
26540   PRINT "WHAT'S SO SIGNIFICANT ABOUT "S$"?"
26550   PRINT "IN OTHER WORDS, 'SO WHAT?'"
26560   Z(50)=1
26570   GOTO 6750
26580   REM   <<<   KEYWORD SUBROUTINE   >>>
26590   LINPUT I$
26600   IF I$="" THEN 6590
26610   W=1
26620   K1=1
26630   I=2
26640   L3=LEN(J$)
26650   Y=INSTR(I,J$," ")
26660   T1$=MID$(J$,I,Y-I)
26670   Y1=INSTR(W,I$,T1$)
26680   IF Y1<>0 THEN 6710
26690   K1=0
26700   RETURN
26710   I=Y+1
26720   W=Y1+1
26730   IF Y<L3 THEN 6650
26740   RETURN
26750   REM   <<<   SIGNAL REMARKS & SEMANTIC STAGS FOR BRANCHING   >>>
26760   PRINT
26770   PRINT
26780   J$=" CONTINUE; "
26790   GOSUB 6590
26800   IF K1=1 THEN 8040
26802   IF I$="NO" THEN 8482
26810   J$=" STOP; "
26820   GOSUB 6600
26830   IF K1=1 THEN 12040
26840   IF I$="?" THEN 8620
26850   J$=" REPEAT; "
26860   GOSUB 6600
```

```
26870   IF K1=1 THEN 9220
26880   J$="*DIRECTIONS!*"
26890   GOSUB 6620
26900   D=1
26910   IF K1=1 THEN 680
26920   J$="*HOW*?*"
26930   GOSUB 6600
26940   IF K1=1 THEN 8660
26950   J$="*WHY*?*"
26960   GOSUB 6600
26970   IF K1=1 THEN 8750
26980   J$="*AS*"
26990   GOSUB 6600
27000   IF K1=1 THEN 8590
27010   J$="*EXPLAIN!*"
27020   GOSUB 6600
27030   IF K1=1 THEN 9360
27040   J$="* DO*N*T *UNDERST*"
27050   GOSUB 6600
27060   IF K1=1 THEN 9360
27070   J$="* DO*N*T *KNOW *"
27080   GOSUB 6600
27090   IF K1=1 THEN 9360
27100   J$="*CHANGE!*"
27110   GOSUB 6600
27120   IF K1=1 THEN 8790
27130   J$="*WHAT*?*"
27140   GOSUB 6600
27150   IF K1=1 THEN 9360
27160   J$="*MEAN*?*"
27170   GOSUB 6600
27180   IF K1=1 THEN 9360
27190   J$="* OR *?*"
27200   GOSUB 6600
27210   IF K1=1 THEN 8880
27220   J$="*CAN I *?*"
27230   GOSUB 6600
27240   IF K1=1 THEN 8920
27250   J$="*IS* IT *?*"
27260   GOSUB 6600
27270   IF K1=1 THEN 8920
27280   J$="*BECAUSE*"
27290   GOSUB 6600
27300   IF K1=1 THEN 8960
27310   J$="*SCENE!*"
27320   GOSUB 6600
27330   IF K1=1 THEN 4170
27340   J$="*ACT!*"
27350   GOSUB 6600
27360   IF K1=1 THEN 4310
27370   J$="*AGENT!*"
27380   GOSUB 6600
27390   IF K1=1 THEN 4460
27400   J$="*AGENCY!*"
27410   GOSUB 6600
27420   IF K1=1 THEN 4610
27430   J$="*PURPOSE!*"
27440   GOSUB 6600
27450   IF K1=1 THEN 4760
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 7460   J$="*?*"
 7470   GOSUB 6600
 7480   IF K1=1 THEN 8990
 7490   IF L4=1 THEN 8020
 7495   IF Q6>0 THEN 7640   'PREVENTS SHORT RESPONSE TO && COMMAND
 7500   IF LEN(I$)<10 THEN 9090
 7510   A=LEN(I$)   'CHECKS LENGTH OF INDIVIDUAL WORDS
 7520   FOR X=1 TO A-1
 7530   IF MID$(I$,X,1)=" " THEN 7570
 7540   X=X+1
 7550   IF X>15 THEN 7600
 7560   GOTO 7580
 7570   X=0
 7580   NEXT X
 7590   GOTO 7620
 7600   X=0
 7610   GOTO 8490
 7620   X=0
 7630   REM   <<<   EXPLORATION BRANCHING AND FEEDBACK   >>>
 7640   PRINT
 7650   PRINT
 7660   F1=INT(4*RND+1)
 7670   F2=INT(5*RND+1)
 7680   E=E+1
 7690   IF E>1 THEN 7790
 7700   ON F1 GOTO 7710,7730,7750,7770
 7710   PRINT "GOOD, "N1$",  ADD TO YOUR RESPONSE NOW,"
 7720   GOTO 6760
 7730   PRINT "FINE, "N1$",  WRITE SOME MORE,"
 7740   GOTO 6760
 7750   PRINT "THAT'S THE IDEA, "N1$",  GIVE ME SOME MORE INFO NOW,"
 7760   GOTO 6760
 7770   PRINT "BY GEORGE, "N1$", GOOD ONE,  WRITE A LITTLE MORE PLEASE."
 7780   GOTO 6760
 7790   ON F2 GOTO 7800,7820,7840,7860,7880
 7800   PRINT "SUPER, "N1$"!"
 7810   GOTO 7890
 7820   PRINT "OUTSTANDING, "N1$"!"
 7830   GOTO 7890
 7840   PRINT "FANTASTIC, "N1$"!"
 7850   GOTO 7890
 7860   PRINT "TERRIFIC, "N1$"!"
 7870   GOTO 7890
 7880   PRINT "GREAT, "N1$"!"
 7890   PRINT
 7900   E3=E3+1   'E3=COUNTER FOR EXPLORED QUESTIONS
 7910   PRINT,,"ANYTHING ELSE?"
 7920   IF E3>2 THEN 7970
 7930   PRINT,,"(YOU CAN ADD MORE INFO, ASK A"
 7940   PRINT,,"QUESTION, OR GIVE A COMMAND --"
 7950   PRINT,,"WHATEVER YOU WISH.)"
 7960   PRINT
 7970   J$="*YE*"
 7980   GOSUB 6590
 7990   IF K1=1 THEN 8650
 8000   L4=1
 8010   GOTO 6810
 8020   PRINT
 8030   PRINT,"OKAY."
 8031   S9=A9=G9=Y9=P9=0   'PREVENTS REPEATED PURPOSE SET, AFTER HEURIST
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IC CHOICE
28040   PRINT
28050   IF C+1=3 THEN 9140
28060   IF C+1=8 THEN 9140
28070   IF C+1=6 THEN 3020
28080   IF C+1=12 THEN 3340
28090   PRINT
28100   PRINT
28110   M8=INT(10*RND+1)
28120   ON M8 GOTO 8130,8150,8170,8190,8210,8230,8250,8270,8290,8310
28130   PRINT "(USE GOOD, STRONG, ACTION VERBS WHEN YOU CAN.)"
28140   GOTO 8320
28150   PRINT "(SEE IF YOU CAN USE THE WORD 'BECAUSE' IN YOUR NEXT ANSWE
R.)"
28160   GOTO 8320
28170   PRINT "(I'LL EXPLAIN A QUESTION IF YOU TYPE 'EXPLAIN!')"
28180   GOTO 8320
28190   PRINT "(THE MORE SENTENCES YOU USE THE BETTER SESSION WE'LL HAVE
.)"
28200   GOTO 8320
28210   PRINT "(IF YOU DON'T UNDERSTAND A QUESTION, JUST SAY SO.  I'LL H
ELP.)"
28220   GOTO 8320
28230   PRINT "(AFTER THE NEXT QUESTION, TYPE 'WHAT?' AND I'LL DO MY THI
NG!)"
28240   GOTO 8320
28250   PRINT "(REASONS ARE IMPORTANT TOO -- THE MORE, THE BETTER.)"
28260   GOTO 8320
28270   PRINT "(HEY, I'M ENJOYING THIS.  YOU'RE QUITE BRIGHT!)"
28280   GOTO 8320
28290   PRINT "(REMEMBER COMMANDS NEED EXCLAMATION MARKS!!  LIKE 'REPEAT
!'....)"
28300   GOTO 8320
28310   PRINT "(I'LL TRY TO ANSWER YOUR QUESTIONS.  DON'T FORGET.)"
28320   PRINT
28330   PRINT
28340   PRINT
28350   PRINT
28360   C8=INT(5*RND+1)
28370   ON C8 GOTO 8380,8400,8420,8440,8460
28380   PRINT "WE'RE MOVING RIGHT ALONG.  HERE IS QUESTION"C+1"."
28390   GOTO 8470
28400   PRINT "AND HERE COMES A REALLY INTERESTING QUESTION--NUMBER"C+1"
."
28410   GOTO 8470
28420   PRINT "QUESTION"C+1"--ONE OF MY ALL-TIME FAVORITES COMING UP."
28430   GOTO 8470
28440   PRINT "HERE IS QUESTION"C+1", "NIS"."
28450   GOTO 8470
28460   PRINT "LET'S SEE, HOW ABOUT QUESTION"C+1"NEXT.  HERE YOU ARE."
28470   PRINT
28480   GOTO 3820
28482   PRINT   'RESPONDS TO IS=NO, AFTER INVENTION PROMPTER
28483   PRINT,"YOU COULD TELL ME 'WHY NOT', BUT YOU"
28484   PRINT "MAY JUST WISH TO CONTINUE.  IF SO, TYPE 'CONTINUE!'"
28485   PRINT "(DON'T FORGET THE EXCLAMATION POINT!!)"
28486   GOTO 4760
28490   PRINT   'RESPONSE TO 'GARBAGE' OR JARGON
28500   PRINT,"HEY, "NIS", WHAT LANGUAGE!!!!!!"
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 8513   PRINT,"TRY IT AGAIN,  I CANNOT UNDERSTAND WHAT YOU'RE SAYING."
 8520   PRINT
 8530   PRINT,"(YOU MAY HAVE RUN SOME WORDS TOGETHER.  IF SO,"
 8540   PRINT,"JUST CONTINUE EXPLORING.  I'LL REPEAT THIS"
 8550   PRINT,"QUESTION IF YOU TYPE 'REPEAT!'  I'LL GO ON IF YOU"
 8560   PRINT,"TYPE 'CONTINUE!'  IF YOU HAVE MORE TO WRITE HERE, GO"
 8570   PRINT,"AHEAD.)"
 8580   GOTO 6760
 8590   PRINT   'ANSWERS THE COMMAND *&*
 8600   PRINT "GO ON, "N1$","
 8605   Q8=Q8+1
 8610   GOTO 6760
 8620   PRINT   'ANSWERS THE SINGLE QUESTION MARK (I$="?")
 8630   PRINT "GO AHEAD, "N1$", ASK,  I'LL DO THE BEST I CAN,"
 8640   GOTO 6760
 8650   PRINT   'ANSWERS A *YE* TO ANYTHING ELSE?
 8660   PRINT "WHAT?"
 8670   GOTO 6760
 8680   PRINT   'ANSWERS THE QUESTION *HOW*?*
 8690   PRINT "I COULD SAY THAT THAT'S FOR ME TO KNOW AND FOR YOU TO FIN
D OUT,"
 8700   PRINT
 8710   PRINT "SERIOUSLY, I CANNOT PRETEND TO KNOW 'HOW', BUT YOU"
 8720   PRINT "SHOULD KEEP EXPLORING FOR AN ANSWER,"
 8730   PRINT
 8740   GOTO 6760
 8750   PRINT   'ANSWERS THE QUESTION *WHY*?*
 8760   PRINT "WELL, WHY NOT?  REMEMBER WE ARE EXPLORING, BRAINSTORMING!
"
 8770   PRINT
 8780   GOTO 6760
 8790   N8=N8+1   'ANSWERS *CHANGE!* COMMAND
 8800   S9=A9=G9=Y9=P9=0
 8810   IF N8>1 THEN 8850
 8820   PRINT
 8830   PRINT "GOOD FOR YOU, "N1$",  NOT EVERY WRITER NARROWS OR"
 8840   PRINT "CHANGES HIS OR HER TOPIC THIS EARLY IN THE INVENTION PROC
ESS,"
 8850   PRINT
 8860   PRINT "PLEASE TYPE IN YOUR NEW SUBJECT:"
 8870   GOTO 2160
 8880   PRINT   'ANSWERS STATEMENT * OR *?*
 8890   PRINT "WHATEVER YOU THINK BEST, "N1$",  YOU DECIDE,"
 8900   PRINT
 8910   GOTO 6760
 8920   PRINT   'ANSWERS QUESTION *CAN I*?*
 8930   PRINT "YES, OF COURSE,"
 8940   PRINT
 8950   GOTO 6760
 8960   PRINT   'RESPONDS TO SUBORDINATE *BECAUSE*
 8970   PRINT,"I LIKE YOUR REASONING,"
 8980   GOTO 7660
 8990   PRINT   'RESPONDS TO *?*
 9000   J8=Q8+1
 9010   IF J8<2 THEN 9060
 9020   IF J8>2 THEN 10530
 9030   PRINT "ANOTHER INTERESTING QUESTION,  I'D SAY 'YES'."
 9040   PRINT
 9050   GOTO 12590
 9060   PRINT "YES, THAT SEEMS OKAY,"
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89870   PRINT
89880   GOTO 12590
89890   PRINT   "RESPONDS TO SHORT ANSWERS
89100   PRINT,"AHHH, SHORT AND SWEET,  NOW TELL ME"
89110   PRINT "WHY?  IN OTHER WORDS, ELABORATE A LITTLE."
89120   PRINT
89130   GOTO 6760
89140   PRINT   "AUTO NARROW/CHANGE LOOP
89150   PRINT "DO YOU WISH TO CHANGE OR NARROW YOUR SUBJECT?"
89160   PRINT,"(YES OR NO?)"
89170   J$="YES"
89180   GOSUB 6590
89190   IF K1=1 THEN 8790
89200   PRINT
89210   GOTO 8360
89220   PRINT   "RESPONDS TO "REPEAT!"
89230   IF Z=R THEN 9270
89240   IF S9=1 THEN 4950'REPRINT SELECTED SCENE QUESTION
89250   IF C<6 THEN 3890'REPRINT ONE OF FIRST RANDOM FIVE QUESTIONS
89260   GOTO 4950'REPRINT RANDOM SCENE QUESTION
89270   IF A9=1 THEN 4960
89280   IF G9=1 THEN 4970
89290   IF Y9=1 THEN 4980
89300   IF P9=1 THEN 4990
89310   IF Z=10=R THEN 4960
89320   IF Z=20=R THEN 4970
89330   IF Z=30=R THEN 4980
89340   IF Z=40=R THEN 4990
89350   REM   <<<   CLARIFICATION ARRAY AND EXAMPLE SEQUENCE   >>>
89360   PRINT
89370   IF X(R)=1 THEN 12610
89380   X(R)=1
89390   IF C>5 THEN 9500
89400   IF S9=1 THEN 9500
89410   IF A9=1 THEN 9510
89420   IF G9=1 THEN 9520
89430   IF Y9=1 THEN 9530
89440   IF P9=1 THEN 9540
89450   IF R<3 THEN 9630
89460   IF R<5 THEN 9640
89470   IF R<7 THEN 9650
89480   IF R<9 THEN 9660
89490   IF R<11 THEN 9670
89500   IF R<11 THEN 9630
89510   IF R<21 THEN 9550
89520   IF R<31 THEN 9570
89530   IF R<41 THEN 9590
89540   IF R<51 THEN 9610
89550   R1=R1-10
89560   GOTO 9640
89570   R1=R1-20
89580   GOTO 9650
89590   R1=R1-30
89600   GOTO 9660
89610   R1=R1-40
89620   GOTO 9670
89630   ON R1 GOTO 9680,9750,9840,9870,9910,9940,9980,10020,10070,10110
89640   ON R1 GOTO 10150,10190,10230,10330,10410,10460,10510,10570,10620
,10670
89650   ON R1 GOTO 10710,10750,10810,10850,10920,11010,11110,11160,11200
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,11250
29460   ON #1 GOTO 11300,11350,11390,11450,11500,11570,11650,11790,11940
,11940
29670   ON #1 GOTO 12000,12060,12080,12120,12160,12220,12270,12300,12340
,12450
29680   PRINT "THIS SCENE QUESTION SHOULD HELP YOU VISUALIZE SPECIFIC"
29690   PRINT "SETTINGS FOR "$$"."
29720   PRINT
29710   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT HUMAN RIGHTS,"
29720   PRINT "I MIGHT WISH TO MENTION THE VARIOUS COUNTRIES"
29730   PRINT "WHERE HUMAN RIGHTS IS A SIGNIFICANT ISSUE."
29740   GOTO 12520
29750   PRINT "I'M THINKING ABOUT SPECIFIC LOCATIONS FOR"
29760   PRINT $$".  THESE LOCATIONS MAY BE"
29770   PRINT "PHYSICAL OR MENTAL, NATURAL OR UNNATURAL."
29780   PRINT
29790   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT THE ARMS"
29800   PRINT "RACE, IT WOULD BE INTERESTING TO CONSIDER THE DIPLOMATIC"
29810   PRINT "LOCATIONS, THE STRATEGIC MILITARY LOCATIONS,"
29820   PRINT "OR EVEN THE HISTORICAL LOCATIONS,"
29830   GOTO 12550
29840   PRINT "BY 'BACKGROUND', I MEAN THOSE DETAILS, CIRCUMSTANCES,"
29850   PRINT "ACTIVITIES, OR SPACE SURROUNDING "$$","
29860   GOTO 12580
29870   PRINT "SOMETIMES A SPECIFIC FEATURE OF THE SETTING HAS"
29880   PRINT "NONE IMPORTANCE--THAT IS, IT SEEMS TO STAND OUT."
29890   PRINT "IS THIS TRUE FOR "$$"?  EXPLAIN."
29900   GOTO 12520
29910   PRINT "'UNIQUE' MEANS 'ONE OF A KIND', 'SPECIAL'.  IF YOUR TOPIC
*
29920   PRINT "DOES NOT SEEM UNIQUE, THEN DESCRIBE HOW IT CONFORMS."
29930   GOTO 12550
29940   PRINT "WHEN WRITING A PAPER, DON'T NEGLECT TO EXPLORE YOUR OWN"
29950   PRINT "EXPERIENCES.  YOU MAY DISCOVER SOMETHING INTERESTING"
29960   PRINT "ENOUGH FOR YOUR INTRODUCTION.  ANY MEMORIES, "HIS"?"
29970   GOTO 12580
29980   PRINT "SETTINGS ARE USUALLY INDIFFERENT FOR MOST SUBJECTS, BUT"
29990   PRINT "SOMETIMES THE 'PLACES' OF "$$
10000   PRINT "SEEM UNUSUALLY APPROPRIATE.  WHY IS THAT?"
10010   GOTO 12520
10020   PRINT "WHAT PARTICULARS OF "$$" ARE THOUGHT"
10030   PRINT "TO BE LESS IMPORTANT.  DO YOU AGREE?  OFTEN AN ANSWER"
10040   PRINT "TO THIS QUESTION CAN PRODUCE A VERY PERSUASIVE THESIS."
10050   PRINT "FOR MANY PEOPLE MAY BE OVERLOOKING SOMETHING SIGNIFICANT.
*
10060   GOTO 12550
10070   PRINT "SOMETIME THE CONDITIONS OR THE SETTINGS FOR THE ACTIONS"
10080   PRINT "OF A SUBJECT COULD BE IMPROVED.  IS THIS THE CASE"
10090   PRINT "WITH "$$"?  WHY OR WHY NOT?"
10100   GOTO 12580
10110   PRINT "IS THERE ANYTHING ABOUT THE SETTING OR SURROUNDINGS OF"
10120   PRINT $$" THAT DELIGHTS, MOTIVATES,"
10130   PRINT "PUZZLES, PERSUADES, OR INFLUENCES SOMEONE IN ANY WAY?"
10140   GOTO 12520
10150   PRINT "AN IMPORTANT QUESTION, FOR IF YOU KNOW WHAT HAPPENS"
10160   PRINT "IN AND AROUND "$$", YOU'LL"
10170   PRINT "PROBABLY HAVE A LOT TO SAY."
10180   GOTO 12550
10190   PRINT "WHAT FORCES HELP CREATE "$$"?"
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12200   PRINT "THIS IS NOT A SIMPLE MATTER--I KNOW THAT--BUT THERE ARE"
12210   PRINT "MANY INSIGHTS IN A CAREFUL EXPLORATION OF CAUSES."
12220   GOTO 12580
12230   PRINT "NEW INFORMATION OR INFORMATION WITH 'SURPRISE VALUE' CAN"
12240   PRINT "MAKE YOUR PAPER INTERESTING.  SO THEN NAME SOMETHING"
12250   PRINT "NEW OR SURPRISING ABOUT "$$"."
12260   PRINT
12270   PRINT "FOR EXAMPLE, IF I WERE WRITING A PAPER ABOUT UFO'S,"
12280   PRINT "I WOULD TRY TO FIND OR REMEMBER AN INTERESTING STORY"
12290   PRINT "ABOUT THE UFO EXPERIENCE.  YOU KNOW, SOMETHING"
12300   PRINT "LIKE A SPECIFIC PERSON'S TRIP TO VENUS."
12310   X(13)=1
12320   GOTO 12520
12330   PRINT "BY 'SOCIETY'S ATTITUDE' I MEAN WHAT DO"
12340   PRINT "PEOPLE IN GENERAL THINK ABOUT "$$"."
12350   PRINT
12360   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT A CONTROVERSIAL"
12370   PRINT "TOPIC (SAY 'ABORTION'), I WOULD WANT TO WRITE SOMETHING"
12380   PRINT "ABOUT PEOPLE'S VARIED VIEWPOINTS."
12390   X(14)=1
12400   GOTO 12550
12410   PRINT "ANALOGIES ARE OFTEN FRUITFUL WAYS TO THINK ABOUT A TOPIC.
"
12420   PRINT "A RAINBOW CAN BE A SYMBOL OF HOPE, A SHORT-LIVED PHENOMEN
ON,"
12430   PRINT "OR SOMETHING WHICH DEMONSTRATES A RANGE OF COLORS.  IS"
12440   PRINT $$" LIKE A RAINBOW?"
12450   GOTO 12580
12460   PRINT "AN IMPORTANT CONSIDERATION WHEN WRITING ABOUT THE ACTIONS
 OF"
12470   PRINT "A SUBJECT IS CLEARLY RECOGNIZING THE CONSEQUENCES OF SUCH
"
12480   PRINT "ACTIONS.  IN OTHER WORDS, WHAT HAPPENS AFTER OR AS A"
12490   PRINT "RESULT OF "$$"?"
12500   GOTO 12520
12510   PRINT "THERE ARE TWO PARTS TO THIS QUESTION.  FIRST, WHO ARE THE
"
12520   PRINT "EXPERTS?  SECOND, ARE THESE EXPERTS (SO-CALLED) TRUSTWORT
HY?"
12530   IF 2864 THEN 12610
12540   PRINT "THIS IS THE KIND OF INFORMATION THAT CAN BE DISCOVERED"
12550   PRINT "DURING THE RESEARCH PHASE.  KEEP THIS QUESTION IN MIND,"
12560   GOTO 12550
12570   PRINT "OFTEN A SUBJECT CAN OR SHOULD AFFECT HUMAN BEHAVIOR.  THI
S"
12580   PRINT "QUESTION ASKS WHAT SHOULD BE DO.  SHOULD WE FIGHT?"
12590   PRINT "SHOULD WE CHANGE?  SHOULD WE BE QUIET ABOUT IT?  SHOULD"
12600   PRINT "WE TAKE STEPS TO UNDERSTAND?"
12610   GOTO 12580
12620   PRINT "ANOTHER WAY TO SAY 'INHERENT CRISIS' IS 'BASIC PROBLEM' O
R"
12630   PRINT "'GENERAL DILEMMA'.  YOU CAN BEGIN BY DISCOVERING THE TWO"
12640   PRINT "OR MORE PARTS OF "$$" WHICH"
12650   PRINT "CREATE THE PROBLEM.  THIS ANSWER IS IMPORTANT!"
12660   GOTO 12520
12670   PRINT "BY 'CUSTOM OR HABIT OF THINKING', I MEAN FOR"
12680   PRINT "YOU TO EXPLORE THOSE MATTERS WHICH TEND TO KEEP"
12690   PRINT $$" FROM CHANGING."
12700   GOTO 12550
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12710   PRINT "BASICALLY, "N1$", I WANT YOU TO NAME A FEW PEOPLE"
12720   PRINT "WHO CARE ABOUT "S$".  THEN I WANT"
12730   PRINT "YOU TO WRITE A FEW WORDS ABOUT THEIR INTEREST."
12740   GOTO 12580
12750   PRINT "THIS IS AN INTERESTING QUESTION SINCE MANY PEOPLE CAN"
12760   PRINT "BE UNAWARE OF HOW "S$" AFFECTS"
12770   PRINT "THEM.  MAYBE ANOTHER WAY TO PHRASE THIS QUESTION WOULD"
12780   PRINT "BE:  ARE PEOPLE ACTIVELY OR PASSIVELY INVOLVED WITH"
12790   PRINT S$"?"
12800   GOTO 12520
12810   PRINT "HOW DO PEOPLE FEEL ABOUT "S$"?"
12820   PRINT "DISTRESSED?  HURT?  HAPPY?  AFRAID?  STRONG?  INDIFFERENT?"
12830   PRINT "PUZZLED?  AMAZED?  FRIGHTENED?  ENCOURAGED?  ETC."
12840   GOTO 12550
12850   PRINT "WHAT GROUP OF PEOPLE ARE MOST LIKELY TO READ ABOUT"
12860   PRINT S$" IN A NEWSPAPER?"
12870   PRINT
12880   PRINT "HERE'S ANOTHER WAY TO LOOK AT IT:  IF YOU WERE NOT"
12890   PRINT "WRITING THIS PAPER FOR CLASS, WHO WOULD YOU"
12900   PRINT "BE WRITING IT FOR?  (NO ONE DOES NOT COUNT!!)"
12910   GOTO 12580
12920   PRINT "WHO ARE THE THINKERS?  WHY ARE THEY THINKING ABOUT"
12930   PRINT S$"?  ARE THEY"
12940   PRINT "TAKING ACTION?  EXPLAIN WHY OR WHY NOT."
12950   PRINT
12960   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT THE DISCOTHEQUE"
12970   PRINT "FAD, I MIGHT WANT TO EXPLORE WHAT THOSE IN THE"
12980   PRINT "NIGHTCLUB BUSINESS THINK ABOUT THE "FEVER"."
12990   X(25)=1
13000   GOTO 12520
13010   PRINT "THIS IS THE FAMILIAR "WHO CARES" QUESTION, BUT HERE THE"
13020   PRINT "ANSWER HAS TO BE SOMEONE,  IF YOU CAN, EXPLAIN WHY"
13030   PRINT "THESE PEOPLE CARE,  WHAT IS AT STAKE FOR THEM?"
13040   PRINT
13050   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT ENERGY RESOURCES,"
13060   PRINT "I WOULD SAY THAT THE PRESIDENT CARES BECAUSE AMERICA'S"
13070   PRINT "NATURAL RESOURCES ARE DIMINISHING, ETC.  I MIGHT WANT"
13080   PRINT "TO FOLLOW THIS MATTER UP BY READING HIS ENERGY PROPOSALS.
"
13090   X(26)=1
13100   GOTO 12550
13110   PRINT "TO CHANGE OR NOT TO CHANGE, THAT IS THE QUESTION."
13120   PRINT
13130   PRINT "DESCRIBE THE PEOPLE AND THEIR RELATIVE POSITIONS REGARDIN
G"
13140   PRINT "CHANGE AND "S$"."
13150   GOTO 12540
13160   PRINT "NOT ALL PEOPLE SHARE THE SAME OPINIONS ABOUT"
13170   PRINT S$".  MENTION THE DIFFERENCES"
13180   PRINT "OR SHADES OF DIFFERENCES WITH REGARD TO ATTITUDE."
13190   GOTO 12520
13200   PRINT "THIS QUESTION HAS MORE TO DO WITH THE FACTS SURROUNDING"
13210   PRINT S$" THAN THE ATTITUDES."
13220   PRINT "ARE THE FACTS OF THE MATTER AGREED UPON"
13230   PRINT "AMONG ALL PARTIES?"
13240   GOTO 12550
13250   PRINT "A GOOD ANSWER TO THIS QUESTION CAN TRULY HELP YOU ORGANIZ
E"
13260   PRINT "YOUR PAPER.  TRY TO BALANCE THE LIST BY MENTIONING"
13270   PRINT "THE OPPOSITE PERSPECTIVE AS WELL.  INCLUDE"
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11280   PRINT "A PERSON'S NAME WITH EACH POINT OF VIEW IF YOU CAN."
11290   GOTO 12580
11300   PRINT "'PROCESSES' IS A CURIOUS WAY TO PUT IT, I SUPPOSE."
11310   PRINT "I WOULD LIKE YOU TO DESCRIBE HOW YOUR SUBJECT,"
11320   PRINT $$; "WORKS.  WHAT INSTRUMENTS,"
11330   PRINT "TOOLS, OR METHODS COME TO MIND?"
11340   GOTO 12520
11350   PRINT "YOU HAVE TO THINK ABOUT TWO THINGS HERE: THE FINAL"
11360   PRINT "PRODUCT OF "$$" AND HOW"
11370   PRINT "THIS PRODUCT CAME ABOUT.  THINK ABOUT IT, "N1$"."
11380   GOTO 12550
11390   PRINT "THIS ANALOGY IS ONE OF MANY I COULD HAVE ASKED YOU."
11400   PRINT "ONE WAY TO LOOK AT IT WOULD BE TO DESCRIBE HOW"
11410   PRINT $$" REACTS TO AND"
11420   PRINT "MEASURES ITS SURROUNDINGS.  YOU CAN PROBABLY THINK"
11430   PRINT "OF ANOTHER INTERPRETATION AS WELL."
11440   GOTO 12580
11450   PRINT "UNDERSTANDING THE WORKINGS OF "$$
11460   PRINT "WILL HELP YOU WRITE.  BY 'PROPS' I"
11470   PRINT "MEAN INSTRUMENTS ASSOCIATED WITH YOUR SUBJECT.  I SUSPECT
"
11480   PRINT "THIS SAME DEFINITION HOLDS FOR 'DEVICES'."
11490   GOTO 12520
11500   PRINT "THIS IS A TOUGH QUESTION, AND YOU MAY WANT TO DO"
11510   PRINT "SOME RESEARCH ABOUT IT.  ESSENTIALLY, YOU SHOULD"
11520   PRINT "BE AWARE OF CAUSE/EFFECT RELATIONSHIPS.  BY 'PSYCHOLOGICA
L'"
11530   PRINT "I MEAN THOSE THINGS WHICH GO ON INSIDE"
11540   PRINT "THE HEAD.  BY 'HISTORICAL' I MEAN THOSE EVENTS AND"
11550   PRINT "CIRCUMSTANCES WHICH SHAPED YOUR TOPIC."
11560   GOTO 12550
11570   PRINT "THIS IS A HUGE QUESTION, AND YOU WILL NOT HAVE TIME TO"
11580   PRINT "EXPLORE IT FULLY HERE TODAY.  ESSENTIALLY, YOU SHOULD"
11590   PRINT "BE AWARE OF THE CAUSE/EFFECT RELATIONSHIPS.  BY 'ECONOMIC
'"
11600   PRINT "I MEAN THOSE MONEY MATTERS WHICH HAVE INFLUENCED YOUR"
11610   PRINT "TOPIC.  BY 'POLITICAL' I MEAN THOSE DECISIONS OF"
11620   PRINT "THE PEOPLE, BY THE PEOPLE, AND FOR THE PEOPLE WHICH"
11630   PRINT "HAVE AFFECTED "$$"."
11640   GOTO 12580
11650   PRINT "THIS IS ABOUT THE MOST DIFFICULT QUESTION IN THIS"
11660   PRINT "SEQUENCE, AND OBVIOUSLY YOU WILL NOT HAVE TIME TO ANSWER"
11670   PRINT "IT AT GREAT LENGTH.  MAINLY, "N1$", I WANT YOU TO BE"
11680   PRINT "AWARE OF THE CAUSE/EFFECT RELATIONSHIPS.  BY 'CULTURAL'"
11690   PRINT "I MEAN THOSE DEEP BELIEFS AND AUTOMATIC BEHAVIORS OF A"
11700   PRINT "NATION OR COMMUNITY OF PEOPLE WHICH AFFECT"
11710   PRINT $$".  BY 'SOCIOLOGICAL' I MEAN"
11720   PRINT "THOSE SPECIFIC NEEDS OF A PARTICULAR GROUP OF PEOPLE."
11730   PRINT
11740   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT SPACE EXPLORATION,"
11750   PRINT "I MIGHT ADDRESS THE NEED FOR MAN TO EXPLORE AND DISCOVER,
"
11760   PRINT "OR I MIGHT CONSIDER HOW SPACE IS OUR MODERN FRONTIER."
11770   X(37)=1
11780   GOTO 12520
11790   PRINT "WHAT DO WE NEED TO LEARN ABOUT "$$"?"
11800   PRINT "HOW ARE WE GOING TO BE TAUGHT?  WHO IS GOING TO TEACH US?
"
11810   PRINT
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11820   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT INFLATION, I WOULD"
11830   PRINT "WRITE THAT WE NEED TO LEARN HOW DANGEROUS"
11840   PRINT "INFLATION COULD BE.  I WOULD ADD THAT WE ARE NOT LEARNING
"
11850   PRINT "RAPIDLY, AND CONSEQUENTLY ONLY A SEVERE RECESSION WILL"
11860   PRINT "TEACH US ANYTHING IMPORTANT.  FINALLY, I WOULD LOCATE"
11870   PRINT "SOME MORE SPECIFIC INFORMATION AT THE LIBRARY."
11880   X(38)=1
11890   GOTO 12550
11900   PRINT "IS MONEY THE ROOT OF ALL EVIL OR THE ONLY HOPE FOR"
11910   PRINT $$"?  IF I GAVE YOU $1,000,000,"
11920   PRINT "HOW WOULD IT AFFECT THE SITUATION?  FOR BETTER OR FOR WOR
SE?"
11930   GOTO 12580
11940   PRINT "ONE OF THE MAJOR 'AGENCY' CONCERNS IS TO STATE"
11950   PRINT "AND DESCRIBE WHATEVER DEVICE/METHOD WILL SIGNIFICANTLY"
11960   PRINT "CHANGE A PERSON'S ATTITUDE ABOUT A SUBJECT.  OBVIOUSLY,"
11970   PRINT "A WELL-PUT ANSWER MAY TELL YOU HOW TO WRITE PERSUASIVELY"
11980   PRINT "ABOUT "$$"."
11990   GOTO 12520
12000   PRINT "THE WORDING MAY SOUND AWKWARD IN THIS QUESTION,"
12010   PRINT "LET'S TRY A SIMPLE ASSOCIATION GAME!"
12020   PRINT,"IF I SAY "$$
12030   PRINT,"AND IF I SAY 'PURPOSE'"
12040   PRINT "WHAT DO YOU THINK ABOUT?  DESCRIBE OR EXPLAIN,"
12050   GOTO 12550
12060   PRINT "I MEAN WHAT WOULD BE THE LAST ACHIEVEMENT?"
12070   GOTO 12580
12080   PRINT "SOMETIMES, "N1$", PURPOSES OR GOALS CHANGE.  HAS"
12090   PRINT "THIS HAPPENED WITH "$$"?"
12100   PRINT "WHY OR WHY NOT?"
12110   GOTO 12520
12120   PRINT "WHEN THERE IS A DISAGREEMENT ABOUT THE FINAL PURPOSE"
12130   PRINT "OF A PARTICULAR ACTION, USUALLY NOT EVERYONE AGREES"
12140   PRINT "ABOUT THE ULTIMATE PURPOSE,  IF THERE ARE DIFFERENCES"
12150   PRINT "ABOUT WHAT SHOULD HAPPEN, DESCRIBE THEM,"
12160   PRINT "CERTAINLY, "$$" IS SUCH A TOPIC,"
12170   GOTO 12550
12180   PRINT "HAVE SOME FUN WITH THIS QUESTION.  PRETEND YOU ARE"
12190   PRINT "A FORTUNE-TELLER; WHAT DO YOU PREDICT?  WHAT SAY"
12200   PRINT "YOU, GREAT PROPHET OF "N2$"?"
12210   GOTO 12580
12220   PRINT "EVERYONE AT SOME TIME HAS FELT THAT THE END OF ONE THING"
12230   PRINT "IS JUST THE BEGINNING OF ANOTHER.  CERTAINLY, THIS OUT"
12240   PRINT "FEELING IS TRUE OF "$$","
12250   PRINT "DO YOU AGREE WITH ME?  WHY OR WHY NOT?"
12260   GOTO 12520
12270   PRINT "WHAT'S THE BIG PICTURE, "N1$"?  HOW DOES"
12280   PRINT $$" FIT INTO THE OVERALL SCHEME?"
12290   GOTO 12550
12300   PRINT "WHY DOES "$$" DEMAND OUR"
12310   PRINT "ATTENTION IN THIS DAY AND AGE.  WHAT REASONS CAN YOU"
12320   PRINT "GIVE FOR THE IMPORTANCE OF YOUR TOPIC?"
12330   GOTO 12580
12340   PRINT "I WAS HOPING YOU WOULD ASK.  NEW SOLUTIONS POSE NEW"
12350   PRINT "PROBLEMS--YOU CAN COUNT ON IT!  NOW THINK ABOUT HOW"
12360   PRINT "KNOWING MORE ABOUT "$$
12370   PRINT "MAY CREATE MORE PROBLEMS.  DO YOU AGREE WITH ME?"
12380   PRINT "WHY OR WHY NOT?"
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12390   PRINT
12400   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT POLITICAL CORRUPTION
,"
12410   PRINT "I MIGHT DEVELOP THE IDEA THAT CORRECTING POLITICAL"
12420   PRINT "CORRUPTION MEANS SOLVING MANY LAW ENFORCEMENT PROBLEMS,"
12430   X(69)=1
12440   GOTO 12520
12450   PRINT "WHY IS "SS" SO IMPORTANT?"
12460   PRINT
12470   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT YOUR TOPIC,"
12480   PRINT SS$, THIS WOULD BE THE"
12490   PRINT "FIRST QUESTION I WOULD WANT TO ANSWER,"
12500   X(50)=1
12510   GOTO 12550
12520   PRINT     'PROMPTERS AFTER CLARIFICATION
12530   PRINT,"TRY ANSWERING THIS QUESTION NOW,"
12540   GOTO 6760
12550   PRINT
12560   PRINT,"WHAT ARE YOU THINKING NOW, "N1$"?"
12570   GOTO 6760
12580   PRINT
12590   PRINT,"YOUR TURN, "N1$","
12600   GOTO 6760
12610   PRINT     'SECOND RESPONSE AFTER CLARIFICATION REQUEST
12620   PRINT "THAT'S ABOUT ALL I CAN ADD AT THE MOMENT,  SORRY!"
12630   GOTO 12550
12640   REM    <<<   CLOSING SEQUENCES    >>>
12650   IF C<3 THEN 12660
12660   IF C<7 THEN 12950
12670   PRINT
12680   PRINT
12690   PRINT,"YOU EXPLORED"E3"QUESTIONS IN THESE FEW MINUTES,"
12700   PRINT,"BUT YOU ARE NOT FINISHED INVENTING YET,"
12710   PRINT
12720   PRINT,"YOU ARE STILL IN THE FIRST STAGES"
12730   PRINT,"OF THE CREATIVE PROCESS,  THE IDEAS YOU HAVE COME"
12740   PRINT,"UP WITH, "N1$", NOW NEED TO SIMMER FOR A LITTLE"
12750   PRINT,"TIME,"
12760   PRINT
12770   PRINT,"I HOPE THAT YOU CAN NOW 'GENERATE' YOUR OWN QUESTIONS"
12780   PRINT,"FROM BURKE'S FIVE PERSPECTIVES.  DON'T NEGLECT THE"
12790   PRINT,"RATIOS AS YOU WRITE YOUR PAPER,"
12800   PRINT
12810   PRINT,"I HOPE YOUR PAPER ON "SS
12820   PRINT,"IS TERRIFIC,"
12830   PRINT
12840   PRINT,,"GOOD BYE, "N1$","
12850   STOP
12860   PRINT
12870   PRINT
12880   PRINT,"HMM, "N1$", YOU ARE IN A HURRY TODAY,"
12890   PRINT
12900   PRINT,"YOU WILL NEED TO SPEND MORE TIME THINKING ABOUT"
12910   PRINT,SS$,"
12920   PRINT
12930   PRINT,"SORRY I COULD NOT HELP YOU MORE,  BYE,"
12940   STOP
12950   PRINT
12960   PRINT
12970   PRINT,"YOU ARE DEFINITELY A DEEP THINKER, "N1$","
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12980   PRINT
12990   PRINT,"YOU WERE ASKED"C"QUESTIONS AND FULLY EXPLORED"
13000   PRINT,E3"OF THEM."
13010   PRINT
13020   PRINT,"PLEASE COME BACK WHEN YOU CAN STAY LONGER."
13030   PRINT
13040   PRINT,,"GOOD BYE."
13050   END
```

```
00010   REM   <<<   INVENTION PROGRAM:  TAGMEMIC MATRIX   >>>
00020   REM   <<<   AUTHOR:  HUGH BURNS   >>>
00030   REM   <<<   THIS PROGRAM MAY BE USED ONLY WITH AUTHOR'S PERMISSI
ON.
00040   REM   USE WITHOUT DIRECT PERMISSION VIOLATES COPYRIGHT LAW.   >>
>
00050   RANDOMIZE
00060   DIM Z(59)
00070   Z(0)=0
00080   DIM X(59)
00090   X(0)=0
00100   P8=0:F8=E=L4=0:C=Q8=E3=0   'COUNTERS
00110   PRINT
00120   PRINT
00130   PRINT
00140   PRINT
00150   PRINT
00160   PRINT,"A COMPUTER-ASSISTED INVENTION PROGRAM:"
00170   PRINT,"--------------------------------------"
00180   PRINT
00190   PRINT,"          THE TAGMEMIC MATRIX"
00200   PRINT,"          -------------------"
00210   PRINT
00220   PRINT
00230   PRINT
00240   PRINT
00250   PRINT,"HI!  WELCOME TO CAI-PROMPTED EXPLORATION,"
00260   PRINT
00270   PRINT "PLEASE TYPE IN YOUR FIRST NAME:  ";
00280   LINPUT N1$
00290   IF N1$="" THEN 280
00300   PRINT
00310   PRINT "NOW, "N1$", PLEASE TYPE IN YOUR LAST NAME:  ";
00320   LINPUT N2$
00330   IF N2$="" THEN 320
00340   IF N2$="TEST!" THEN 3850
00350   PRINT
00360   PRINT "THANK YOU, "N1$" "N2$",  I HOPE I CAN BE OF SOME"
00370   PRINT "ASSISTANCE TO YOU TODAY.  IF WE TAKE EACH OTHER SERIOUSLY
."
00380   PRINT "I KNOW YOU'LL THINK ABOUT YOUR TOPIC AS YOU NEVER HAVE BEFO
RE."
00390   PRINT
00400   PRINT
00410   PRINT,"BEFORE WE BEGIN, "N1$",  THERE'S AN OLD"
00420   PRINT "SAYING ABOUT COMPUTER-ASSISTED INSTRUCTION.  IT GOES:"
00430   PRINT
00440   PRINT,,"GARBAGE IN, GARBAGE OUT!""
00450   PRINT
00460   PRINT "IN OTHER WORDS, YOU AND I MUST COOPERATE SO THAT"
00470   PRINT "YOU CAN GET A GOOD START ON YOUR RESEARCH PAPER."
00480   PRINT
00490   PRINT
00500   PRINT
00510   PRINT,,"(PRESS 'RETURN' TO CONTINUE.)";
00520   LINPUT A$
00530   PRINT
00540   PRINT
00550   PRINT
00560   PRINT "WOULD YOU LIKE TO REVIEW THE DIRECTIONS AND THE COMMANDS?
```

```
19970   PRINT,"(YES OR NO)"
19980   INPUT A$
19990   GOSUB 6870
20000   IF A1=1 THEN 620
20010   GOTO 1740
20020   REM   <<<   DIRECTIONS AND COMMANDS   >>>
20030   PRINT
20040   PRINT
20050   PRINT,"DIRECTIONS:"
20060   PRINT
20070   PRINT
20080   PRINT,"1.  WHEN YOU MAKE A TYPING ERROR, "N1$", AND"
20090   PRINT,"WISH TO CORRECT IT, USE THE 'RUBOUT' OR 'RUB' KEY."
20100   PRINT,"THE 'SHIFT' MUST BE DEPRESSED WHEN YOU 'RUBOUT'."
20110   PRINT,"IT MAY LOOK A LITTLE FUNNY (LIKE WRITING BACKWARDS),"
20120   PRINT,"BUT DON'T WORRY! IT WORKS THAT WAY."
20130   PRINT
20140   PRINT,"     (NOTE: SPELLING IS NOT CRUCIAL TO INVENTION.)"
20150   PRINT
20160   PRINT
20170   PRINT,"2.  REMEMBER THAT I CAN ONLY READ ABOUT A LINE AND"
20180   PRINT,"A HALF OF INFORMATION AT ONE TIME -- ABOUT THIS MUCH:"
20190   PRINT
20200   PRINT"-------------------------------------------------------
--------------------------------------"
20810   PRINT
20820   PRINT,"HIT 'RETURN' AT THAT POINT AND I'LL GENERALLY"
20830   PRINT,"ASK YOU TO CONTINUE.  IF THAT DOES NOT WORK, TYPE"
20840   PRINT,"'&' AND I'LL SAY 'GO ON, "N1$","
20850   PRINT
20860   PRINT,,"(HIT 'RETURN' TO CONTINUE.)"
20870   LINPUT A$
20880   PRINT
20890   PRINT
20900   PRINT,"3.  AFTER YOU FINISH TYPING YOUR RESPONSE, YOU MUST PRESS
"
20910   PRINT,"THE 'RETURN' KEY.  WHEN YOU DO, I'LL READ YOUR"
20920   PRINT,"RESPONSE AND SAY SOMETHING BACK TO YOU."
20930   PRINT
20940   PRINT
20950   PRINT,"4.  THE MOST IMPORTANT OBJECTIVE OF THIS PROGRAM"
20960   PRINT,"IS TO GET YOU THINKING ABOUT YOUR TOPIC."
20970   PRINT
20980   PRINT,"IN ORDER TO ACHIEVE THIS OBJECTIVE, YOU MUST FORGET"
20990   PRINT,"THAT I AM A MACHINE."
21000   PRINT
21010   PRINT,"PLEASE ASK QUESTIONS.  YOU'LL BE SURPRISED BY HOW MUCH"
21020   PRINT,"I KNOW (OR SO I HOPE!)   I'M NOT GUARANTEEING THE TRUTH,"
21030   PRINT,"BUT I'LL DO THE VERY BEST I CAN.  MY MEMORY IS STILL"
21040   PRINT,"DEVELOPING."
21050   PRINT
21060   PRINT
21070   PRINT
21080   PRINT
21090   PRINT,,"(PRESS 'RETURN' TO CONTINUE.)"
21100   PRINT
21110   PRINT
21120   LINPUT A$
21130   PRINT
```

```
01140   PRINT
01150   PRINT
01160   PRINT
01170   PRINT "COMMANDS:","TYPE IN-->","I'LL DO THIS-->"
01180   PRINT,"----------","---------------"
01190   PRINT
01200   PRINT,"STOP:","I'LL STOP ASKING QUESTIONS AND CLOSE."
01210   PRINT
01220   PRINT,"CONTINUE:","I'LL SKIP AHEAD TO THE NEXT QUESTION."
01230   PRINT
01240   PRINT,"REPEAT:","I'LL REPEAT THE QUESTION."
01250   PRINT
01260   PRINT,"DIRECTIONS:","I'LL SHOW YOU THESE DIRECTIONS AGAIN."
01270   PRINT
01280   PRINT,"CHANGE:","I'LL LET YOU CHANGE OR NARROW YOUR SUBJECT."
01290   PRINT
01300   PRINT,"?","I'LL LET YOU ASK A QUESTION."
01310   PRINT
01320   PRINT,"EXPLAIN:","I'LL EXPLAIN THE QUESTION."
01330   PRINT
01340   PRINT,"PARTICLE:","I'LL LET YOU SELECT THE NEXT TAGMEMIC"
01350   PRINT,,"QUESTION'S PERSPECTIVE.  YOU CAN ALSO TYPE"
01360   PRINT,,"'WAVE:' OR 'FIELD:'"
01370   PRINT
01380   PRINT,"&&","I'LL LET YOU CONTINUE WITH YOUR RESPONSE."
01390   PRINT
01400   PRINT,,"(PRESS 'RETURN' TO CONTINUE.)";
01410   LINPUT A$
01420   PRINT
01430   PRINT
01440   PRINT
01450   PRINT
01460   PRINT
01470   PRINT,"TWO LAST THINGS:"
01480   PRINT
01490   PRINT
01500   PRINT,"***   THINK OF ME AS A PERSON WHO CAN ASK A LOT OF"
01510   PRINT,"INTERESTING, THOUGHT-PROVOKING, AND WILD QUESTIONS."
01520   PRINT
01530   PRINT
01540   PRINT,"***   SCREAM FOR HELP IF I START ACTING REALLY CRAZY!!"
01550   PRINT,"      (PARTICULARLY, IF I DON'T SEEM TO BE ANSWERING YOU.
)"
01560   PRINT
01570   PRINT
01580   PRINT
01590   PRINT,,"(PRESS 'RETURN' TO GO ON.)"
01600   PRINT
01610   PRINT
01620   PRINT
01630   PRINT
01640   PRINT
01650   PRINT
01660   LINPUT A$
01670   IF O=1 THEN 1690
01680   GOTO 1760
01690   PRINT
01700   PRINT,"BACK TO THE QUESTIONS, "N1$"   --->   --->   --->"
01710   PRINT
```

```
01720   PRINT
01730   PRINT
01740   PRINT,,"BUT FIRST IS THERE"
01750   GOTO 8150
01760   PRINT
01770   PRINT
01780   PRINT
01790   PRINT
01800   PRINT
01810   PRINT "DO YOU WISH TO SEE A SHORT DESCRIPTION OF THE TAGMEMIC MA
TRIX?"
01820   PRINT,"(YES OR NO?)"
01830   J$="YES"
01840   GOSUB 6870
01850   IF K1=1 THEN 1870
01860   GOTO 2140
01870   REM   <<<   DESCRIPTION OF TAGMEMIC MATRIX   >>>
01880   PRINT
01890   PRINT
01900   PRINT
01910   PRINT,"THE TAGMEMIC MATRIX HEURISTIC:"
01920   PRINT
01930   PRINT
01940   PRINT,"BRIEFLY, THE TAGMEMIC MATRIX ENCOURAGES A WRITER TO"
01950   PRINT "THINK ABOUT A TOPIC FROM NINE PERSPECTIVES,"
01960   PRINT
01970   PRINT,"FOR THIS PROGRAM, HOWEVER, I HAVE SIMPLIFIED THIS A"
01980   PRINT "BIT.  THIS PROGRAM WILL ASK YOU QUESTIONS FROM ONLY THREE
"
01990   PRINT "PERSPECTIVES, WHICH YOU WILL RECALL FROM OUR CLASS DISCUS
SION,"
02000   PRINT
02010   PRINT,"1.  PARTICLE -- VIEWING A SUBJECT IN ITSELF (STATIC);"
02020   PRINT
02030   PRINT,"2.  WAVE -- VIEWING A SUBJECT AS IT CHANGES (DYNAMIC); AN
D"
02040   PRINT
02050   PRINT,"3.  FIELD -- VIEWING A SUBJECT'S RELATIONSHIP TO OTHER"
02060   PRINT,,"SUBJECTS (IN A SYSTEM)."
02070   PRINT
02080   PRINT,,"(HIT 'RETURN' TO CONTINUE.)"
02090   PRINT
02100   PRINT
02110   PRINT
02120   PRINT
02130   LINPUT A$
02140   REM   <<<   SUBJECT SEQUENCE   >>>
02150   PRINT
02160   PRINT
02170   PRINT
02180   PRINT
02190   PRINT
02200   PRINT
02210   PRINT
02220   PRINT
02230   PRINT
02240   PRINT
02250   PRINT
02260   PRINT
02270   PRINT,"NOW I MUST ASK YOU WHAT YOU ARE WRITING"
```

```
02280   PRINT "ABOUT.  SO WOULD YOU PLEASE TYPE IN YOUR SUBJECT."
02290   PRINT "(I AM LOOKING FOR ONE TO THREE WORDS, MAYBE FOUR.)"
02300   PRINT
02310   PRINT
02320   PRINT
02330   PRINT
02340   PRINT
02350   PRINT
02360   PRINT
02370   PRINT
02380   PRINT
02390   PRINT,!
02400   LINPUT $$
02410   IF $$="" THEN 2400
02420   IF LEN($$)<35 THEN 2550
02430   PRINT
02440   PRINT "THAT'S A MOUTHFUL, "N1$".  MAKE IT SHORTER, LIKE A TITLE.
*
02450   PRINT
02460   PRINT,"HERE ARE THREE EXAMPLES:"
02470   PRINT
02480   PRINT,"  **  RELIGIOUS CULTS"
02490   PRINT,"  **  LASER BEAMS"
02500   PRINT,"  **  THE NAVAHO CULTURE TODAY"
02510   PRINT
02520   PRINT
02530   PRINT,"YOUR TURN,  WHAT IS YOUR SUBJECT?"
02540   GOTO 2320
02550   IF Y8>0 THEN 2570
02560   GOTO 2650
02570   PRINT
02580   PRINT "YOUR REVISED SUBJECT IS "$$"."
02590   PRINT
02600   PRINT
02610   PRINT
02620   PRINT
02630   PRINT
02640   GOTO 8340
02650   PRINT
02660   PRINT
02670   J=INT(3*RND+1)
02680   ON J GOTO 2690,2720,2750
02690   PRINT "REALLY!  THAT'S FUNNY, I USED TO DATE A COMPUTER INTERES'
ED IN"
02700   PRINT $$"."
02710   GOTO 2760
02720   PRINT "HEY, THAT'S COOL, "N1$"!  WE'LL HAVE A GOOD TIME"
02730   PRINT "BRAINSTORMING "$$"."
02740   GOTO 2780
02750   PRINT $$", HMMMMMM!  YOU'LL BE SURPRISED"
02760   PRINT "BY THE RECENT SCHOLARSHIP ON THIS TOPIC.  ASK THE"
02770   PRINT "LIBRARIAN IN THE REFERENCE AREA."
02780   PRINT
02790   PRINT,,"(HIT 'RETURN' TO CONTINUE.)"
02800   LINPUT A$
02810   REM   <<<   PURPOSE SEQUENCE   >>>
02820   PRINT
02830   PRINT
02840   PRINT
02850   PRINT
```

```
02860   PRINT,"A COMMENT ABOUT YOUR PURPOSE:"
02870   PRINT
02880   PRINT
02890   PRINT
02900   PRINT,"WRITING WITHOUT A PURPOSE OR AIM, "N1$", IS"
02910   PRINT "QUITE FRANKLY A WASTE OF TIME.  DOING SO GENERATES VERBAL
"
02920   PRINT "FOG, DESTROYS WRITING EFFICIENCY, AND DEFEATS THE ESSENCE
"
02930   PRINT "OF COMMUNICATION,"
02940   PRINT
02950   PRINT,"THEREFORE, THROUGHOUT THIS EXPLORATION PROCESS,"
02960   PRINT "YOU WILL BE ASKED TO WRITE ABOUT THE PURPOSE OF YOUR PAPE
R"
02970   PRINT "ON "S$","
02980   PRINT
02990   PRINT,"SO NOW WOULD YOU BRIEFLY DESCRIBE THE"
03000   PRINT "PURPOSE OF YOUR PAPER BY COMPLETING THIS STATEMENT:"
03010   PRINT,"(ONE LINE LIMIT, PLEASE)"
03020   PRINT
03030   PRINT "THE PURPOSE OF MY PAPER IS TO, . . ."
03040   PRINT
03050   PRINT
03060   PRINT
03070   LINPUT P$
03080   IF P$="" THEN 3070
03090   PRINT
03100   GOSUB 3780
03110   PRINT
03120   PRINT "FINE, "N1$", YOU AND I WILL TALK AGAIN ABOUT YOUR"
03130   PRINT "PURPOSE."
03140   PRINT
03150   PRINT
03160   GOTO 3850
03170   PRINT   "PURPOSE SEQUENCE AT C+1=6
03180   PRINT
03190   PRINT,"BEFORE WE CONTINUE, "N1$", I WANT YOU"
03200   PRINT,"TO THINK ABOUT YOUR PURPOSE ONCE AGAIN,"
03210   PRINT
03220   PRINT "      YOU HAVE ALREADY TOLD ME THAT YOUR PURPOSE WAS"
03230   PRINT "TO "P$"."
03240   PRINT
03250   PRINT
03260   PRINT "NOW HOW WOULD YOU COMPLETE THIS STATEMENT:"
03270   PRINT
03280   PRINT,"IF NOTHING ELSE, I WANT MY READER TO, . . ."
03290   PRINT,"(LIMIT:  ONE LINE)"
03300   PRINT
03310   PRINT
03320   LINPUT P1$
03330   IF P1$="" THEN 3320
03340   PRINT
03350   GOSUB 3780
03360   PRINT,"OKAY, GOOD.  LET'S KEEP YOUR PURPOSE IN MIND."
03370   REM   <<<   RESET POOL, POST-STRATIFICATION   >>>
03380   Z(4)=Z(5)=Z(6)=Z(7)=Z(8)=Z(9)=Z(10)=0
03390   X(4)=X(5)=X(6)=X(7)=X(8)=X(9)=X(10)=0
03400   IF P9=1 THEN 4610
03410   IF W9=1 THEN 4760
```

```
03420   IF F9=1 THEN 4920
03430   PRINT
03440   PRINT
03450   PRINT
03460   PRINT,"HERE IS YOUR NEXT QUESTION -- NUMBER"C+1","
03470   PRINT
03480   PRINT
03490   GOTO 4070
03500   PRINT    "PURPOSE SEQUENCE AT C+1=12
03510   IF N8>0 THEN 3400
03520   PRINT
03530   PRINT,"LET'S PAUSE ONCE AGAIN TO CONSIDER YOUR INTENT,"
03540   PRINT
03550   PRINT,"YOUR GENERAL PURPOSE IS TO"
03560   PRINT P$","
03570   PRINT
03580   PRINT,"ALSO, YOU WANT YOUR READER TO"
03590   PRINT P1$","
03600   PRINT
03610   PRINT "IS THERE ANYTHING ELSE YOU WISH TO SAY ABOUT YOUR PURPOSE
?"
03620   PRINT,"(YES OR NO?)"
03630   J$="YE"
03640   GOSUB 6870
03650   IF K1=1 THEN 3690
03660   PRINT
03670   PRINT,"FINE, "N1$", ENOUGH ABOUT YOUR PURPOSE,"
03680   GOTO 3400
03690   PRINT
03700   PRINT
03710   PRINT,"SUPER, "N1$", WHAT WOULD YOU LIKE TO ADD?"
03720   PRINT,"(AGAIN, ONE LINE LIMIT IN EFFECT)"
03730   PRINT
03740   LINPUT P2$
03750   IF P2$="" THEN 3740
03760   GOSUB 3780
03770   GOTO 3660
03780   PRINT
03790   PRINT,"ANY MORE?"
03800   PRINT,"(IF SO, TYPE WHATEVER IT IS; IF NOT, TYPE 'NO'.)"
03810   PRINT
03820   LINPUT A$
03830   PRINT
03840   RETURN
03850   PRINT    "PAGING FOR QUESTIONS
03860   PRINT
03870   PRINT
03880   PRINT
03890   PRINT
03900   PRINT
03910   PRINT "HERE WE GO.  RELAX AND ENJOY THE MIND-STRETCHING!"
03920   PRINT
03930   PRINT
03940   PRINT
03950   PRINT
03960   PRINT
03970   PRINT
03980   PRINT
03990   PRINT
```

```
34000   PRINT
34010   GOTO 4960
34020   PRINT,"BACK TO THE QUESTIONS, "N1$"   ---->   ---->   ---->"
34030   PRINT
34040   PRINT
34050   GOTO 8130
34060   REM   <<<   COUNTER/EXPLORATION CONTROLS   >>>
34070   C=C+1
34080   E=L4=Q8=Q6=P9=W9=F9=0
34090   IF C>59 THEN 12260
34100   IF C>5 THEN 4230
34110   Q=R=R1=INT(10*RND+1)
34120   IF Z(Q)=1 THEN 4110
34130   Z(Q)=1
34140   IF Q<4 THEN 4170
34150   IF Q<8 THEN 4190
34160   IF Q<11 THEN 4210
34170   P8=P8+1
34180   GOTO 4490
34190   W8=W8+1
34200   GOTO 4510
34210   F8=F8+1
34220   GOTO 4520
34230   Q=R=R1=INT(59*RND+1)
34240   IF Z(Q)=1 THEN 4230
34250   Z(Q)=1
34260   IF Q<24 THEN 4300
34270   IF Q<35 THEN 4350
34280   F8=F8+1
34290   GOTO 4360
34300   P8=P8+1
34310   GOTO 4330
34320   W8=W8+1
34330   IF Q<11 THEN 4490
34340   IF Q<21 THEN 4390
34350   IF Q<31 THEN 4410
34360   IF Q<41 THEN 4430
34370   IF Q<51 THEN 4450
34380   IF Q<61 THEN 4470
34390   Q=Q-10
34400   GOTO 4530
34410   Q=Q-20
34420   GOTO 4513
34430   Q=Q-30
34440   GOTO 4520
34450   Q=Q-40
34460   GOTO 4539
34470   Q=Q-50
34480   GOTO 4540
34490   ON Q GOTO 5490,5550,5580,5170,5190,5220,5250,5280,5310,5340
34500   ON Q GOTO 5370,5400,5430,5460,5490,5520,5120,5142,5612,5642
34510   ON Q GOTO 5670,5700,5720,5760,5840,5860,6010,5790,5822,5920
34520   ON Q GOTO 5980,5950,6050,6070,6110,6140,6170,6290,6360,6250
34530   ON Q GOTO 6190,6330,6220,6400,6430,6460,6480,6510,6540,6570
34540   ON Q GOTO 6590,6620,6650,6680,6710,6740,6770,6800,6830
34550   REM   <<<   P=F SUBJECT CONTROL-dRANCHING   >>>
34560   P8=P8+1
34570   P9=1
34580   C=C+1
34590   IF C<6 THEN 3170
```

```
34600   IF C=12 THEN 3500
34610   IF C>59 THEN 12263
34620   IF F8>23 THEN 5030
34630   PRINT
34640   W9=F9=E=L4=U8=Q6=0
34650   PRINT "HERE IS QUESTION"C"--A PARTICLE QUESTION."
34660   PRINT
34670   Q=R=R1=INT(23*RND+1)
34680   IF Z(Q)=1 THEN 4670
34690   Z(Q)=1
34700   GOTO 4330
34710   W8=W8+1
34720   W9=1
34730   C=C+1
34740   IF C=6 THEN 3170
34750   IF C=12 THEN 3500
34760   IF C>59 THEN 12263
34770   IF W8>11 THEN 5030
34780   PRINT
34790   P9=F9=E=L4=Q8=Q6=0
34800   PRINT "HERE IS QUESTION"C"--A WAVE QUESTION."
34810   PRINT
34820   Q=R=R1=INT(34*RND+1)
34830   IF Q<24 THEN 4820
34840   IF Z(Q)=1 THEN 4820
34850   Z(Q)=1
34860   GOTO 4350
34870   F8=F8+1
34880   F9=1
34890   C=C+1
34900   IF C=6 THEN 3170
34910   IF C=12 THEN 3500
34920   IF C>59 THEN 12240
34930   IF F8>25 THEN 5030
34940   PRINT
34950   P9=W9=E=L4=Q8=Q6=0
34960   PRINT "HERE IS QUESTION"C"--A FIELD QUESTION."
34970   PRINT
34980   Q=R=R1=INT(59*RND+1)
34990   IF Q<35 THEN 4980
35000   IF Z(Q)=1 THEN 4980
35010   Z(Q)=1
35020   GOTO 4360
35030   PRINT
35040   PRINT,"SORRY.  NO MORE QUESTIONS LEFT HERE.  WHAT NOW?"
35050   L4=1
35060   GOTO 7040
35070   REM   <<<   TAGMEMIC QUESTION POOL   >>>
35080   REM   <<<   'PARTICLE' POINT OF VIEW   >>>
35090   PRINT "DESCRIBE THE PHYSICAL CHARACTERISTICS OF"
35100   PRINT SS","
35110   GOTO 7040
35120   PRINT "HOW IS "SS" STATIC?"
35130   GOTO 7040
35140   PRINT "WHAT MAKES "SS", "SS"?"
35150   PRINT "DESCRIBE ITS ESSENTIAL CHARACTERISTICS."
35160   GOTO 7040
35170   PRINT "WHAT ELEMENTS DOES "SS" CONTAIN?  ELABORATE."
35180   GOTO 7040
```

```
05190   PRINT "IF I CONFINE "SS" IN A CIRCLE, WHAT DOES"
05200   PRINT "IT SUGGEST?  TAKE A DEEP BREATH AND THINK, "NIS"."
05210   GOTO 7040
05220   PRINT "IF I PLACE "SS" IN A MAZE, WHAT DOES IT"
05230   PRINT "SUGGEST?  TAKE YOUR TIME."
05240   GOTO 7040
05250   PRINT "IF I PLACE "SS" OUTSIDE A CIRCLE,"
05260   PRINT "WHAT DOES IT SUGGEST TO YOU?"
05270   GOTO 7040
05280   PRINT "DESCRIBE THE PHILOSOPHICAL CHARACTERISTICS OF"
05290   PRINT SS"."
05300   GOTO 7040
05310   PRINT "DESCRIBE THE SOCIOLOGICAL CHARACTERISTICS OF"
05320   PRINT SS"."
05330   GOTO 7040
05340   PRINT "DESCRIBE THE POLITICAL CHARACTERISTICS OF"
05350   PRINT SS"."
05360   GOTO 7040
05370   PRINT "DESCRIBE THE CULTURAL CHARACTERISTICS OF"
05380   PRINT SS"."
05390   GOTO 7040
05400   PRINT "DESCRIBE THE SPIRITUAL CHARACTERISTICS OF"
05410   PRINT SS"."
05420   GOTO 7040
05430   PRINT "DESCRIBE THE HISTORICAL CHARACTERISTICS OF"
05440   PRINT SS"."
05450   GOTO 7040
05460   PRINT "HOW IS "SS" ISOLATED FROM OTHER SIMILAR"
05470   PRINT "TOPICS?"
05480   GOTO 7040
05490   PRINT "WHAT FEATURES OF "SS" REMAIN THE SAME"
05500   PRINT "OVER TIME?"
05510   GOTO 7040
05520   PRINT "WHAT FEATURES OF "SS" DO NOT CHANGE OVER"
05530   PRINT "TIME?"
05540   GOTO 7040
05550   PRINT "WHAT IS THE MOST OUTSTANDING PHYSICAL FEATURE OF"
05560   PRINT SS"?"
05570   GOTO 7040
05580   PRINT "TAKE A MENTAL PHOTOGRAPH OF "SS",  DESCRIBE"
05590   PRINT "ONE IMPORTANT DETAIL."
05600   GOTO 7040
05610   PRINT "IMAGINE ENLARGING A PHOTOGRAPH OF "SS",  WHAT"
05620   PRINT "DETAIL OR FEATURE WOULD YOU BRING INTO FOCUS?  EXPLAIN."
05630   GOTO 7040
05640   PRINT "SEPARATE THE PROPERTIES OF "SS",  NOW LIST"
05650   PRINT "THEM."
05660   GOTO 7040
05670   PRINT "WHAT INSULATES "SS" FROM THE REST OF"
05680   PRINT "THE WORLD?"
05690   GOTO 7040
05700   PRINT "LIST THE STATIC GEOGRAPHIC FEATURES OF "SS"."
05710   GOTO 7040
05720   PRINT "LIST THE STATIC ECONOMIC CONSIDERATIONS OF"
05730   PRINT SS"."
05740   GOTO 7040
05750   REM   <<<   'WAVE' POINT OF VIEW   >>>
05760   PRINT "DESCRIBE HOW "SS" PHYSICALLY CHANGES."
05770   Z(24)=1
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25780   GOTO 7040
25790   PRINT "HOW LONG DOES IT TAKE FOR "SS" TO CHANGE?"
25800   PRINT "EXPLAIN YOUR REASONING."
25810   GOTO 7040
25820   PRINT "WHAT FACTORS CAUSE "SS" TO CHANGE?  ELABORATE."
25830   GOTO 7040
25840   PRINT "LIST ONE OR TWO OF "SS""S DYNAMIC"
25850   PRINT "CHARACTERISTICS."
25860   Z(25)=1
25870   GOTO 7040
25880   PRINT "HOW IS "SS" LIKE A PLANT?  DESCRIBE THE SEED,"
25890   PRINT "THE ROOTS, THE BLOOMS, THE BRANCHES, THE LEAVES, . . ."
25900   Z(26)=1
25910   GOTO 7040
25920   PRINT "HOW DOES "SS" GROW?  USE YOUR IMAGINATION,"
25930   PRINT N1$"!"
25940   GOTO 7040
25950   PRINT "HOW DOES "SS" CHANGE INTO SOMETHING ELSE,"
25960   PRINT "ELABORATE."
25970   GOTO 7040
25980   PRINT "HOW DOES "SS" INTERACT WITH FORCES AROUND"
25990   PRINT "ITSELF?"
26000   GOTO 7040
26010   PRINT "HOW COULD "SS" CHANGE SO THAT MORE PEOPLE"
26020   PRINT "WOULD BELIEVE, ACCEPT, OR UNDERSTAND?  EXPLAIN."
26030   Z(27)=1
26040   GOTO 7040
26050   PRINT "HOW IS "SS" LIKE A CHAIN REACTION?  DESCRIBE."
26060   GOTO 7040
26070   PRINT "HOW IS "SS" LIKE AN OCEAN TIDE?  REACH"
26080   PRINT "FOR IT, "N1$"!"
26090   GOTO 7040
26100   REM    <<<   'FIELD' PERSPECTIVE   >>>
26110   PRINT "ON THIS PLANET, HOW IS "SS" DISTRIBUTED?"
26120   PRINT "DESCRIBE."
26130   GOTO 7040
26140   PRINT "IS "SS" FOUND AMONG ALL PEOPLES, ALL NATIONS?"
26150   PRINT "WHY OR WHY NOT?"
26160   GOTO 7040
26170   PRINT "HOW IS THE MAJOR CONCERN OF "SS" LOCALIZED?"
26180   GOTO 7040
26190   PRINT "WHAT SYSTEM OF BELIEFS SURROUND "SS"?"
26200   PRINT "ELABORATE."
26210   GOTO 7040
26220   PRINT "VIEW "SS" AS AN ABSTRACT, MULTI-DIMENSIONAL"
26230   PRINT "SYSTEM.  WHAT DOES THIS PERSPECTIVE SUGGEST?"
26240   GOTO 7040
26250   PRINT "HOW ARE THE CHUNKS OR COMPONENTS OF "SS
26260   PRINT "ORGANIZED IN RELATION TO ONE ANOTHER?  DESCRIBE."
26270   Z(40)=1
26280   GOTO 7040
26290   PRINT "IS "SS" BEST ARRANGED BY SPACE, TIME, OR"
26300   PRINT "CLASS?"
26310   Z(38)=1
26320   GOTO 7040
26330   PRINT "WHAT ORGANIZATIONAL PRINCIPLE DO YOU SEE IN"
26340   PRINT SS$"."
26350   GOTO 7040
26360   PRINT "THINK OF "SS" AS AN ELECTRON.  WHAT IS THE"
26370   PRINT "NUCLEUS IDEA IT REVOLVES AROUND?  DESCRIBE."
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```
 6380   Z(39)=1
 6390   GOTO 7040
 6400   PRINT "COUNTER THIS ARGUMENT:  I SUGGEST THAT "$$" DOES"
 6410   PRINT "NOT EXIST.  WHAT DOES ITS EXISTENCE DEPEND UPON?"
 6420   GOTO 7040
 6430   PRINT "HOW IS "$$" ONLY A PIECE OF THE PUZZLE?"
 6440   PRINT "DESCRIBE."
 6450   GOTO 7040
 6460   PRINT "HOW IS "$$" LIKE A RECIPE?  EXPLAIN."
 6470   GOTO 7040
 6480   PRINT "HOW IS "$$" LIKE A PAGE IN A BLUEPRINT?"
 6490   PRINT "DESCRIBE."
 6500   GOTO 7040
 6510   PRINT "HOW IS "$$" LIKE THE HUMAN BLOOD SYSTEM?"
 6520   PRINT "EXPLAIN."
 6530   GOTO 7040
 6540   PRINT $$" HAS EXPLODED.  EVERYTHING IS FLYING AROUND."
 6550   PRINT "DESCRIBE WHAT YOU SEE."
 6560   GOTO 7040
 6570   PRINT "WHAT RULES HOLD "$$" TOGETHER?  EVERYTHING HAS RULES."
 6580   GOTO 7040
 6590   PRINT "IF YOU COULD CHANGE ANYTHING ABOUT "$$","
 6600   PRINT "WHAT WOULD IT BE?  EXPLAIN YOUR RATIONALE."
 6610   GOTO 7040
 6620   PRINT "IS "$$" PART OF A GOOD OR A BAD SYSTEM?"
 6630   PRINT "EXPLAIN."
 6640   GOTO 7040
 6650   PRINT "IS "$$" PART OF A STRONG OR WEAK SYSTEM?"
 6660   PRINT "ELABORATE."
 6670   GOTO 7040
 6680   PRINT $$" IS BECOMING INVISIBLE, AND AS IT"
 6690   PRINT "DISAPPEARS, YOU SEE THINGS YOU HAVE NEVER SEEN.  DESCRIBE.
*
 6720   GOTO 7040
 6710   PRINT $$" IS TIED ONTO A TUG OF WAR ROPE."
 6720   PRINT "DESCRIBE THE FORCES WHICH ARE PULLING AT EACH END."
 6730   GOTO 7040
 6740   PRINT $$" IS NOW A SERIES OF LAYERS.  GO DOWN"
 6750   PRINT "THROUGH THE STACK AND DESCRIBE WHAT YOU SEE."
 6760   GOTO 7040
 6770   PRINT "IMAGINE "$$" IS A FAMILY UNIT.  DESCRIBE THE"
 6780   PRINT "FATHER, THE MOTHER, THE GRANDPARENTS, ETC."
 6790   GOTO 7040
 6800   PRINT "DESCRIBE THE WINTER, SPRING, SUMMER, AND FALL OF"
 6810   PRINT $$".  THINK ABOUT IT, "NIS"."
 6820   GOTO 7040
 6830   PRINT "TO WHAT COMMUNITY DOES "$$" BELONG?"
 6840   PRINT "A COMMUNITY OF IDEAS."
 6850   GOTO 7040
 6860   REM   <<<   KEYWORD SUBROUTINE (SINGLE-LINE INPUTS)   >>>
 6870   LINPUT I$
 6880   IF I$="" THEN 6870
 6890   W=1
 6900   K1=1
 6910   I=2
 6920   L0=LEN(J$)
 6930   Y=INSTR(I,J$,"=")
 6940   T1$=MID$(J$,I,Y-I)
 6950   Y1=INSTR(W,I$,T1$)
 6960   IF Y1<>0 THEN 6990
```

```
 6970   K1=0
 6980   RETURN
 6990   I=Y+1
 7000   W=Y1+1
 7010   IF Y<L0 THEN 6930
 7020   RETURN
 7030   REM    <<<   SEMANTIC READING   >>>
 7040   PRINT
 7050   PRINT
 7060   J$="CONTINUE|"
 7070   GOSUB 6870
 7080   IF K1=1 THEN 8290
 7090   IF I$="NO" THEN 8720
 7100   J$="STOP|"
 7110   GOSUB 6880
 7120   IF K1=1 THEN 12260
 7130   IF I$="?" THEN 8890
 7140   J$="REPEAT|"
 7150   GOSUB 6880
 7160   IF K1=1 THEN 9540
 7170   J$="DIRECTIONS|"
 7180   GOSUB 6880
 7190   D=1
 7200   IF K1=1 THEN 620
 7210   J$="HOW?"
 7220   GOSUB 6880
 7230   IF K1=1 THEN 9080
 7240   J$="WHY?"
 7250   GOSUB 6880
 7260   IF K1=1 THEN 9150
 7270   J$="&"
 7280   GOSUB 6880
 7290   IF K1=1 THEN 8850
 7300   J$="EXPLAIN|"
 7310   GOSUB 6880
 7320   IF K1=1 THEN 9670
 7330   J$=" DON'T UNDERST"
 7340   GOSUB 6880
 7350   IF K1=1 THEN 9670
 7360   J$=" DON'T KNOW"
 7370   GOSUB 6880
 7380   IF K1=1 THEN 9670
 7390   J$="CHANGE|"
 7400   GOSUB 6880
 7410   IF K1=1 THEN 9650
 7420   J$="WHAT?"
 7430   GOSUB 6880
 7440   IF K1=1 THEN 9670
 7450   J$="MEAN?"
 7460   GOSUB 6880
 7470   IF K1=1 THEN 9670
 7480   J$=" OR "
 7490   GOSUB 6880
 7500   IF K1=1 THEN 9260
 7510   J$="CAN I "
 7520   GOSUB 6880
 7530   IF K1=1 THEN 9290
 7540   J$="IS IT "
 7550   GOSUB 6880
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```
 7560   IF K1=1 THEN 9290
 7570   JS="+?+"
 7580   GOSUB 6880
 7590   IF K1=1 THEN 8950
 7600   JS="+BECAUSE+"
 7610   GOSUB 6880
 7620   IF K1=1 THEN 9190
 7630   JS="+PARTICLE|+"
 7640   GOSUB 6880
 7650   IF K1=1 THEN 4560
 7660   JS="+WAVE|+"
 7670   GOSUB 6880
 7680   IF K1=1 THEN 4710
 7690   JS="+FIELD|+"
 7700   GOSUB 6880
 7710   IF K1=1 THEN 4870
 7720   IF L4=1 THEN 8260
 7730   IF Q6>0 THEN 7870'PERMITS SHORT ANS=ERS AFTER && COMMAND
 7740   IF LEN(I$)<10 THEN 9220
 7750   A=LEN(I$)    'CHECKS LENGTH OF INDIVIDUAL STRINGS/WORDS
 7760   FOR K=1 TO A-1
 7770   IF MID$(I$,K,1)=" " THEN 7810
 7780   X=X+1
 7790   IF X>15 THEN 7840'GARBAGE OR JARGON RESPONSE
 7800   GOTO 7820
 7810   X=0
 7820   NEXT K
 7830   GOTO 7860
 7840   X=0
 7850   GOTO 8770
 7860   X=0
 7870   REM   <<<   EXPLORATION BRANCHING AND FEEDBACK   >>>
 7880   PRINT
 7890   PRINT
 7900   F1=INT(4*RND+1)
 7910   F2=INT(5*RND+1)
 7920   E=E+1
 7930   IF E>1 THEN 8030
 7940   ON F1 GOTO 7950,7970,7990,8010
 7950   PRINT "GOOD, "N1$",  ADD TO YOUR RESPONSE NOW."
 7960   GOTO 7040
 7970   PRINT "FINE, "N1$",  WRITE SOME MORE."
 7980   GOTO 7040
 7990   PRINT "THAT'S THE IDEA, "N1$",  GIVE ME SOME MORE INFO."
 8000   GOTO 7040
 8010   PRINT "BY GEORGE, "N1$", GOOD ONE,  A LITTLE MORE PLEASE."
 8020   GOTO 7040
 8030   ON F2 GOTO 8040,8060,8080,8100,8120
 8040   PRINT "SUPER, "N1$"!"
 8050   GOTO 8130
 8060   PRINT "OUTSTANDING, "N1$"!"
 8070   GOTO 8130
 8080   PRINT "FANTASTIC, "N1$"!"
 8090   GOTO 8130
 8100   PRINT "TERRIFIC, "N1$"!"
 8110   GOTO 8130
 8120   PRINT "GREAT, "N1$"!"
 8130   PRINT
 8140   E3=E3+1     'E3=-COUNTER FOR EXPLORED QUESTIONS
 8150   PRINT,,"ANYTHING ELSE?"
```

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 8160   IF E3>2 THEN 8200
 8170   PRINT,,"(YOU CAN ADD MORE INFO, ASK A"
 8180   PRINT,,"QUESTION, OR GIVE A COMMAND --"
 8190   PRINT,,"WHATEVER YOU WISH,)"
 8200   PRINT
 8210   J$="YE"
 8220   GOSUB 6670
 8230   IF K1=1 THEN 8920
 8240   L4=1
 8250   GOTO 7100
 8260   PRINT
 8270   PRINT,"O K A Y ,"
 8280   P9=W9=F9=0'PREVENTS REPEATED PURPOSE SEQ, AFTER HEURISTIC CHOICE
 8290   PRINT
 8300   IF C=1=3 THEN 9320
 8310   IF C=1=8 THEN 9320
 8320   IF C=1=6 THEN 3170
 8330   IF C=1=12 THEN 3500
 8340   PRINT
 8350   PRINT
 8360   M8=INT(10*RND+1)
 8370   ON M8 GOTO 8380,8400,8420,8440,8460,8480,8500,8520,8540,8560
 8380   PRINT "(SEE IF YOU CAN USE THE WORD 'BECAUSE' IN YOUR NEXT ANSWE
R,)"
 8390   GOTO 8570
 8400   PRINT "(IF YOU DON'T UNDERSTAND, SAY SO.  I'LL TRY TO HELP,)"
 8410   GOTO 8570
 8420   PRINT "(HEY, "N1$", I'M ENJOYING THIS,  KEEP ON TRUCKIN'!)"
 8430   GOTO 8570
 8440   PRINT "(AFTER THE NEXT QUESTION, TYPE 'WHAT?' AND I'LL DO MY THI
NG.)"
 8450   GOTO 8570
 8460   PRINT "(USE SOME STRONG VERBS IN YOUR ANSWERS WHEN YOU CAN,)"
 8470   GOTO 8570
 8480   PRINT "(LESS PHRASES AND MORE SENTENCES -- USE '&' IF NECESSARY
.)"
 8490   GOTO 8570
 8500   PRINT "(REASONS ARE VERY IMPORTANT; DON'T NEGLECT TYPING THEM IN
.)"
 8510   GOTO 8570
 8520   PRINT "(ALL IDEAS ARE GOOD IDEAS; TYPE IN WHAT YOU THINK!!!)"
 8530   GOTO 8570
 8540   PRINT "(REMEMBER COMMANDS NEED EXCLAMATION MARKS, LIKE 'REPEAT!)
"
 8550   GOTO 8570
 8560   PRINT "(THE LONGER YOUR ANSWERS, THE MORE I CAN HELP YOU RECALL,
)"
 8570   PRINT
 8580   PRINT
 8590   C8=INT(5*RND+1)
 8600   ON C8 GOTO 8610,8630,8650,8670,8690
 8610   PRINT "WE'RE MOVING RIGHT ALONG.  HERE IS QUESTION"C+1"."
 8620   GOTO 8700
 8630   PRINT "HERE COMES AN INTERESTING ONE -- NUMBER"C+1"."
 8640   GOTO 8700
 8650   PRINT "QUESTION"C+1" -- ONE OF MY FAVORITES -- COMING UP."
 8660   GOTO 8700
 8670   PRINT "LET'S SEE.  HOW ABOUT QUESTION"C+1"NEXT.  HERE YOU ARE."
 8680   GOTO 8700
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28690   PRINT "YOUR NEXT QUESTION IS NUMBER"C+1","
28700   PRINT
28710   GOTO 4070
28720   PRINT   'RESPONDS TO IS=NO, AFTER INVENT ON PROMPTER
28730   PRINT,"YOU COULD TELL ME 'WHY NOT', BUT
28740   PRINT "MAY JUST WISH TO CONTINUE.  IF     YPE 'CONTINUE;'"
28750   PRINT "(DON'T FORGET TO TYPE THE EXCLAMATION POINT!;)"
28760   GOTO 7040
28770   PRINT   'GARBAGE OR JARGON RESPONSE
28780   PRINT "HEY, "N1$", PLEASE USE ENGLISH I CAN UNDERSTAND.  THANKS,
"
28790   PRINT
28800   PRINT,"(YOU MAY HAVE FORGOTTEN TO SPACE BETWEEN WORDS,"
28810   PRINT,"SO IF YOU CAN UNDERSTAND WHAT YOU SAID, JUST"
28820   PRINT,"CONTINUE ANSWERING THIS QUESTION.  TYPE 'REPEAT;'"
28830   PRINT,"TO SEE THE QUESTION AGAIN.)"
28840   GOTO 7040
28850   PRINT   'ANSWERS THE COMMAND *A&*
28860   PRINT "GO ON, "N1$","
28870   Q6=Q6+1
28880   GOTO 7040
28890   PRINT   'ANSWERS THE SINGLE QUESTION MARK (IS="?")
28900   PRINT "GO AHEAD, "N1$", ASK,  I'LL DO THE BEST I CAN."
28910   GOTO 7040
28920   PRINT   'ANSWERS A *YE* TO ANYTHING ELSE?
28930   PRINT "WHAT?"
28940   GOTO 7040
28950   PRINT   'RESPONDS TO A *?*
28960   Q8=Q8+1
28970   IF Q8<2 THEN 9020
28980   IF Q8>2 THEN 9040
28990   PRINT "ANOTHER INTERESTING PROBLEM, AND BASED UPON WHAT WE'VE"
29000   PRINT "DONE SO FAR, I'D SAY 'YES',"
29010   GOTO 12210
29020   PRINT "YES.  THAT'S RIGHT,"
29030   GOTO 12210
29040   IF Q8=4 THEN 12240
29050   PRINT "THIS QUESTION MIGHT BE BETTER ANSWERED BY A HUMANOID,"
29060   PRINT "PERHAPS DURING YOUR RESEARCH PHASE.  KEEP IT IN MIND."
29070   GOTO 12180
29080   PRINT   'ANSWERS *HOW*?*
29090   PRINT "WELL, THAT'S FOR ME TO KNOW AND FOR YOU TO FIND OUT,"
29100   PRINT
29110   PRINT "SERIOUSLY, THOUGH, I DON'T KNOW 'HOW',  LET'S KEEP"
29120   PRINT "EXPLORING FOR AN ANSWER.  YOUR TURN, "N1$","
29130   PRINT
29140   GOTO 7040
29150   PRINT   'ANSWERS *WHY*?*
29160   PRINT "WELL, WHY NOT?  REMEMBER WE ARE EXPLORING, INQUIRING!"
29170   PRINT
29180   GOTO 7040
29190   PRINT   'FEEDBACK FOR *BECAUSE*
29200   PRINT,"THAT'S AN INTERESTING REASON,"
29210   GOTO 7900
29220   PRINT   'RESPONDS TO SHORT ANSWERS -- LEN(IS)<10
29230   PRINT,"A SHORT AND DIRECT RESPONSE.  GOOD, "N1$","
29240   PRINT"NOW EXPLAIN WHY?  ELABORATE A LITTLE BIT,"
29250   GOTO 7040
29260   PRINT   'ANSWERS * OR *?*
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 9270   PRINT "WHATEVER YOU THINK BEST, "N1$".  YOU DECIDE."
 9280   GOTO 7040
 9290   PRINT    'ANSWERS *CAN I *?*
 9300   PRINT "YES, OF COURSE."
 9310   GOTO 7040
 9320   PRINT    'AUTO NARROW/CHANGE LOOP
 9330   PRINT
 9340   PRINT "DO YOU *ISH TO NARROW OR CHANGE YOUR SUBJECT?"
 9350   PRINT "MAYBE REVISE THE WAY IT SOUNDS IN THESE QUESTIONS?"
 9360   PRINT,"(YES OR NOT)"
 9370   J$="*YE*"
 9380   GOSUB 6470
 9390   IF K1=1 THEN 9450
 9400   PRINT
 9410   PRINT
 9420   PRINT
 9430   PRINT
 9440   GOTO 8320
 9450   N8=N8+1    'ANSWERS *CHANGE!* COMMAND
 9460   P9=W9=F9=0
 9470   IF N8>1 THEN 9510
 9480   PRINT
 9490   PRINT "GOOD FOR YOU, "N1$",  NOT EVERY WRITER NARROWS OR"
 9500   PRINT "CHANGES HIS OR HER TOPIC THIS EARLY IN THE INVENTION PROC
ESS."
 9510   PRINT
 9520   PRINT,"PLEASE TYPE IN YOUR REVISED SUBJECT:"
 9530   GOTO 2350
 9540   PRINT    'REPRINTS THE QUESTION
 9550   IF I=R THEN 9590
 9560   IF P9=1 THEN 4330
 9570   IF C<6 THEN 9640
 9580   GOTO 4330
 9590   IF I=10=R THEN 4500
 9600   IF I=20=R THEN 4510
 9610   IF I=30=R THEN 4520
 9620   IF I=42=R THEN 4530
 9630   IF I=52=R THEN 4540
 9640   IF I=4 THEN 4490
 9650   IF I=8 THEN 4510
 9660   IF I=11 THEN 4520
 9670   REM    <<<   CLARIFICATION ARRAY AND EXAMPLE SEQUENCE   >>>
 9680   PRINT
 9690   IF I/8=I\8 THEN 12240
 9700   I=I+1
 9710   IF I=9 THEN 3780
 9720   IF P9=1 THEN 3780
 9730   IF I=6 THEN 9800
 9740   IF I=5 THEN 9810
 9750   IF I=3 THEN 9840'PARTICLE BRANCHING
 9760   IF I=7 THEN 9860'WAVE BRANCHING
 9770   IF I=2 THEN 9870'FIELD BRANCHING
 9780   IF I=1 THEN 9880
 9790   IF I=0 THEN 9890
 9800   I=I+1
 9810   IF I=1 THEN 9900
 9820   IF I=2 THEN 9910
 9830   IF I=3 THEN 9920
 9840   IF I=4 THEN 9930
 9850   IF I=5 THEN 9940
 9860   IF I=6 THEN 9950
 9870   IF I=7 THEN 9960
 9880   IF I=8 THEN 9970
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 9850   GOTO 9950
 9860   R1=R1-20
 9870   GOTO 9960
 9880   R1=R1-30
 9890   GOTO 9970
 9900   R1=R1-40
 9910   GOTO 9980
 9920   R1=R1-50
 9930   GOTO 9990
 9940   ON R1 GOTO 10450,10550,10620,10690,10130,10160,10190,10220,10250
,10290
 9950   ON R1 GOTO 10320,10360,10400,10420,10000,10520,10030,10260,10690
,10720
 9960   ON R1 GOTO 10750,10780,10810,10840,10940,11060,11230,10920,10950,
11140
 9970   ON R1 GOTO 11200,11170,11310,11340,11360,11380,11400,11540,11660
,11470
 9980   ON R1 GOTO 11420,11630,11450,11730,11760,11780,11800,11830,11860
,11880
 9990   ON R1 GOTO 11900,11920,11950,11970,12000,12040,12070,12090,12120
10000   PRINT "WHAT DOES "S$" LOOK LIKE?"
10010   PRINT "DESCRIBE SIZE, SHEIGHT, WEIGHT, MASS, ETC."
10020   GOTO 12150
10030   PRINT "BY 'STATIC', I MEAN UNCHANGING, INERT, PERHAPS EVEN STAGN
ANT"
10040   PRINT "OR UNPROGRESSIVE."
10050   GOTO 12180
10060   PRINT "HERE I WANT YOU TO DESCRIBE THOSE PROPERTIES WHICH ARE"
10070   PRINT "UNIQUE TO "S$"."
10080   GOTO 12210
10090   PRINT "ELEMENTS IS PERHAPS TOO GENERAL A TERM, BUT I WANT YOU TO
"
10100   PRINT "LIST THOSE FEATURES WHICH ARE LIMITED TO YOUR TOPIC."
10110   PRINT S$".  WE ARE AFTER AN INSIDE DEFINITION."
10120   GOTO 12150
10130   PRINT "MAINLY, I WANT YOU TO DESCRIBE "S$" AS"
10140   PRINT "A CLOSED SYSTEM--IMPRISONED, CONFINED,"
10150   GOTO 12180
10160   PRINT "I'M THINKING ABOUT A PUZZLE, NOT CORN (MAIZE).  HOW IS"
10170   PRINT S$" PUZZLING, TRAPPED IN A MAZE."
10180   GOTO 12210
10190   PRINT "HOW IS "S$" SEPARATED FROM A"
10200   PRINT "CLOSED GROUP.  ALSO WHAT PREVENTS ITS ENTRY?"
10210   GOTO 12150
10220   PRINT "CONSIDER QUESTIONS OF EXISTENCE, ETHICS, INTELLECTUAL MAT
TERS,"
10230   PRINT "OR REASONING PRINCIPLES."
10240   GOTO 12180
10250   PRINT "CONSIDER THOSE CHARACTERISTICS OF "S$
10260   PRINT "WHICH AFFECT SOCIETY IN GENERAL.  SOCIAL EVIL?"
10270   PRINT "SOCIAL CLASS?  COMMUNITY CONCERNS?"
10280   GOTO 12210
10290   PRINT "GENERALLY, I'M THINKING ABOUT ELEMENTS OF TENSION IN"
10300   PRINT S$".  YOU CAN BE SPECIFIC IF YOU LIKE."
10310   GOTO 12150
10320   PRINT "CULTURAL REFERS TO EITHER (1) CIVILIZATIONS, OR (2) MATTE
RS"
10330   PRINT "CONSIDERED TO BE EDUCATIONAL.  YOU CAN PROBABLY ADD ANOTH
ER"
10340   PRINT "DEFINITION."
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10350   GOTO 12180
10360   PRINT "AN ANSWER HERE MAY TAKE SOME IMAGINATION,  IT COULD"
10370   PRINT "REFER TO THE INTANGIBLE, UNREAL, PERHAPS EVEN SUPERFICIAL
"
10380   PRINT "ASPECTS OF "$$"."
10390   GOTO 12210
10400   PRINT "WHAT IN THE PAST HELPED "$$"?"
10410   GOTO 12150
10420   PRINT "FIRST, THINK OF A TOPIC LIKE YOURS.  SECOND, DESCRIBE"
10430   PRINT "WHY "$$" IS DIFFERENT."
10440   GOTO 12180
10450   PRINT "BY 'REMAIN THE SAME,' I MEAN THOSE THINGS ABOUT"
10460   PRINT $$" THAT DO NOT CHANGE."
10470   PRINT
10480   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT COMPUTER ELECTRONICS
--"
10490   PRINT "A SUBJECT NEAR TO MY HEART--I COULD WRITE HERE A DEFINITI
ON"
10500   PRINT "OF 'SOLID STATE'."
10510   GOTO 12210
10520   PRINT "I'M THINKING ABOUT A PHOTOGRAPHIC DESCRIPTION HERE--"
10530   PRINT "BUT NOT A MOVIE, RATHER A STILL PHOTO."
10540   GOTO 12150
10550   PRINT "IF I SAY "$$" TO PEOPLE,"
10560   PRINT "WHAT IS THE FIRST THING THEY WOULD SEE IN THEIR MINDS?"
10570   PRINT
10580   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT COLLEGE ATHLETICS,"
10590   PRINT "I MIGHT FIRST THINK ABOUT FOOTBALL--RECRUITING, PUBLICITY
,"
10600   PRINT "CHARACTER-BUILDING, BIG-TIME ENTERTAINMENT, ETC."
10610   GOTO 12180
10620   PRINT "CONCENTRATE NOW ON SEEING "$$"."
10630   PRINT "WHAT FEATURE STANDS OUT THE MOST?  DESCRIBE."
10640   PRINT
10650   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT UFO SIGHTINGS,"
10660   PRINT "I WOULD VISUALIZE ALIEN WORLDS AND STRANGE SAUCER-SHAPED"
10670   PRINT "SPACECRAFT.  LOTS OF INTERESTING DETAILS IN SUCH A TOPIC.
"
10680   GOTO 12210
10690   PRINT "I AM TRYING TO GET YOU TO EXPLAIN WHY SOME FEATURES OF"
10700   PRINT $$" ARE MORE IMPORTANT THAN OTHERS."
10710   GOTO 12150
10720   PRINT "I AM LOOKING FOR A LIST OF CRUCIAL FEATURES WHICH MIGHT"
10730   PRINT "HELP YOU ORGANIZE YOUR PAPER.  AN IMPORTANT QUESTION!!"
10740   GOTO 12180
10750   PRINT "PERHAPS A CONDITION OF "$$" MAKES"
10760   PRINT "IT UNIQUE.  IF SO, DESCRIBE."
10770   GOTO 12210
10780   PRINT "WHERE IS "$$" FOUND?  ON OUR PLANET?"
10790   PRINT "IN THE MIND?  IN THE UNIVERSE?  IN THE U.S. OF A?"
10800   GOTO 12150
10810   PRINT "COULD MONEY BE CONSIDERED A FEATURE OF "$$"?"
10820   PRINT "HOW SO?  EXPLAIN."
10830   GOTO 12180
10840   PRINT "LOOKING FOR YOUR NOTIONS ABOUT THE DEVELOPMENT OF"
10850   PRINT $$". . . ."
10860   PRINT
10870   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT HUMAN DEVELOPMENT,"
10880   PRINT "I WOULD WRITE ABOUT GROWTH, CHANGES DUE TO MATURING--"
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10890   PRINT "ADULT 'PASSAGES' HAVE BEEN POPULAR FARE LATELY,"
10900   X(24)=1
10910   GOTO 12210
10920   PRINT "I'M WONDERING HERE ABOUT THE RELATIVE SPEED OF CHANGE."
10930   PRINT "WHAT DOES PROGRESS MEAN TO "SS"?"
10940   GOTO 12150
10950   PRINT "LIKE PEOPLE?  LIKE DISEASE?  LIKE TIME?  LIKE GROWTH?"
10960   PRINT "LIKE MATURITY?  LIKE PROGRESS?"
10970   GOTO 12180
10980   PRINT "BY 'DYNAMIC', I MEAN THE TENDENCY FOR "SS
10990   PRINT "TO CHANGE.  WHAT ENERGIZES "SS"?"
11000   PRINT
11010   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT WOMEN IN POLITICS,"
11020   PRINT "I WOULD THINK ABOUT PARTICULAR POLITICAL ORGANIZATIONS LI
KE"
11030   PRINT "N.O.W.  HEY, WHAT ABOUT THE EQUAL RIGHTS AMENDMENT?"
11040   X(25)=1
11050   GOTO 12210
11060   PRINT "I WANT YOU TO BREAK DOWN "SS" AND"
11070   PRINT "EXAMINE ITS ORGANIC DEVELOPMENT."
11080   PRINT
11090   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT INFLATION,"
11100   PRINT "THE ROOTS MIGHT BE GREED; THE TRUNK MIGHT BE THE AMERICAN
"
11110   PRINT "FREE ENTERPRISE SYSTEM; AND BLOSSOMS MIGHT BE FOOD PRICES
."
11120   X(26)=1
11130   GOTO 12150
11140   PRINT "YOU SHOULD SEE THE ANSWERS I GET TO THIS.  WOW!!!"
11150   PRINT "I'M AFTER A CREATIVE GUESS."
11160   GOTO 12180
11170   PRINT "YOU KNOW--FROM CHRYSALIS TO BUTTERFLY, A SORT OF"
11180   PRINT "METAMORPHOSIS."
11190   GOTO 12210
11200   PRINT "I GUESS I AM THINKING OF A CHEMICAL EXPERIMENT WITH"
11210   PRINT SS" AS A CATALYDIC AGENT."
11220   GOTO 12150
11230   PRINT "IN OTHER WORDS, WHAT WOULD MAKE "SS
11240   PRINT "MORE CONVINCING?"
11250   PRINT
11260   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT DREAM INTERPRETATION
."
11270   PRINT "I WOULD ARGUE THAT A GREATER UNDERSTANDING OF JUNG'S PSYC
HOLOGY"
11280   PRINT "WOULD HELP MY AUDIENCE UNDERSTAND THE UNCONSCIOUS SELF."
11290   X(27)=1
11300   GOTO 12180
11310   PRINT "IN OTHER WORDS, HOW DOES ONE ACTION OF "
11320   PRINT SS" TRIGGER A REACTION? "
11330   GOTO 12210
11340   PRINT "DOES "SS" HAVE EBB AND FLOW?  A CYCLE?"
11350   GOTO 12150
11360   PRINT "IS "SS" FOUND EVERYWHERE OR WHAT?"
11370   GOTO 12180
11380   PRINT "WHO IS MAINLY INTERESTED IN "SS"?"
11390   GOTO 12210
11400   PRINT "WHERE IS MOST OF THE ACTION OF "SS"?"
11410   GOTO 12150
11420   PRINT "A LARGE PROBLEM WITH MANY TOPICS!  DESCRIBE THE "
```

```
11430   PRINT "INTELLECTUAL DIMENSIONS OF "$$"."
11440   GOTO 12160
11450   PRINT "IS THERE A SOLAR SYSTEM (SO TO SPEAK) OF "$$"?"
11460   GOTO 12210
11470   PRINT "WHAT GOES WHERE?  DOES TIME OR SPACE MAKE MORE SENSE?"
11480   PRINT
11490   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT SCUBA DIVING,"
11500   PRINT "I COULD WRITE ABOUT THE EQUIPMENT CHECKS IN DIVE PLANNING
"
11510   PRINT "AND PLANNING THE DECOMPRESSION STOPS IN ADVANCE,"
11520   X(40)=1
11530   GOTO 12150
11540   PRINT "'CLASS' MEANS CATEGORIES OR CLASSIFICATIONS.  BY THE WAY,
"
11550   PRINT "ANSWERING THIS QUESTION MAY HELP YOU DETERMINE THE MOST"
11560   PRINT "APPROPRIATE MODE FOR YOUR PAPER,"
11570   PRINT
11580   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT THE DEPRESSION,"
11590   PRINT "I WOULD BE QUITE CONCERNED ABOUT TIME; MOST HISTORICAL"
11600   PRINT "TOPICS ARE CONCERNED WITH TIME."
11610   X(38)=1
11620   GOTO 12180
11630   PRINT "TIME?  SPACE?  CAUSE-EFFECT?  COMPARISON-CONTRAST?"
11640   PRINT "GENERAL-SPECIFIC?  SPECIFIC-GENERAL?"
11650   GOTO 12210
11660   PRINT "WHAT FORCES KEEP "$$" IN PLACE?"
11670   PRINT
11680   PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT SOLAR ENERGY,"
11690   PRINT "I WOULD VISUALIZE SOLAR ENERGY ORBITING EARTH'S DIMINISHI
NG"
11700   PRINT "ENERGY RESOURCES, SUCH AS GAS, COAL, ETC."
11710   X(39)=1
11720   GOTO 12150
11730   PRINT "YEAH, "NIS", THOUGHT YOU WOULD ASK.  I DON'T HAVE"
11740   PRINT "ANY IDEA.  I WAS JUST ASKING WHAT YOU THOUGHT.  ANYTHING?
"
11750   GOTO 12180
11760   PRINT "WHERE DOES "$$" FIT INTO THE LARGER SYSTEM?"
11770   GOTO 12210
11780   PRINT "IS THERE A FORMULA TO FOLLOW, LIKE MY ALGORITHMS?  DESCRI
BE."
11790   GOTO 12150
11800   PRINT "AN ANALOGY OF THE 'FIELD' PERSPECTIVE--HOW IS"
11810   PRINT $$" LIKE A PLAN FOR SOMETHING?"
11820   GOTO 12180
11830   PRINT "WHAT IS THE HEART OF "$$"?  THE ARTERIES? "
11840   PRINT "THE VEINS?  DON'T FORGET THE FUNCTIONS INVOLVED."
11850   GOTO 12210
11860   PRINT "BOOOOOOM!!!    DUCK!!!   HIT THE FLOOR!!!"
11870   GOTO 12150
11880   PRINT "DESCRIBE THE GLUE OF "$$","
11890   GOTO 12180
11900   PRINT "ITS EFFECT ON PEOPLE?  THE WAY IT WORKS?  THE PEOPLE INVO
LVED?"
11910   GOTO 12210
11920   PRINT "AN EVALUATION,SURE, BUT IT MAY HELP YOU SEE"
11930   PRINT $$" IN A NEW LIGHT,"
11940   GOTO 12150
11950   PRINT "WHAT DO "$$" AND POWER HAVE IN COMMON?"
11960   GOTO 12180
```

```
11970   PRINT "A MIND-BREAKER, ISN'T IT?  LOOKING FOR AN INSIGHT ON"
11980   PRINT "THE INSIDE."
11990   GOTO 12210
12000   PRINT "X  <---------- "S$" ---------->  Y"
12010   PRINT
12020   PRINT "DESCRIBE X AND Y."
12030   GOTO 12150
12040   PRINT "LIKE PANCAKES?  LIKE A DECK OF CARDS?  LIKE A GEOGRAPHICA
L"
12050   PRINT "SURVEY?"
12060   GOTO 12180
12070   PRINT "THE CHILD IS THE PARENT PERSON OF THE PERSON PERSON."
12080   GOTO 12210
12090   PRINT "ARE THERE SEASONAL CHARACTERISTICS ABOUT "
12100   PRINT S$"--BIRTH, YOUTH, MATURITY, DEATH?"
12110   GOTO 12150
12120   PRINT "A CATEGORY OF THOUGHT ABOUT "S$
12130   PRINT "WOULD BE CALLED _____.  DESCRIBE."
12140   GOTO 12180
12150   PRINT   "PROMPTERS AFTER CLARIFICATION
12160   PRINT "TRY ANSWERING THIS QUESTION NOW."
12170   GOTO 7040
12180   PRINT
12190   PRINT "WHAT ARE YOU THINKING, "N1$"?"
12200   GOTO 7040
12210   PRINT
12220   PRINT,"YOUR TURN, "N1$"."
12230   GOTO 7040
12240   PRINT "THAT'S ABOUT ALL I CAN ADD AT THE MOMENT,  SORRY."
12250   GOTO 12180
12260   REM   <<<   CLOSINGS   >>>
12270   IF C<3 THEN 12590
12280   IF C<7 THEN 12520
12290   PRINT
12300   PRINT
12310   PRINT "          YOU EXPLORED"E3"OF THE"C"QUESTIONS I ASKED."
12320   PRINT "BUT YOU ARE NOT FINISHED INVENTING YET, "N1$"!"
12330   PRINT "IN THE LANGUAGE OF A COGNITIVE PSYCHOLOGIST, YOU ARE JUST
"
12340   PRINT "BEGINNING THE 'INCUBATION' STAGE,  YOUR IDEAS NEED"
12350   PRINT "TO SIMMER NOW."
12360   PRINT
12370   PRINT,"I HOPE YOU NOW CAN ASK YOUR OWN QUESTIONS"
12380   PRINT "FROM THE PERSPECTIVES OF PARTICLE, WAVE, AND FIELD."
12390   PRINT
12400   PRINT,"AS A MATTER OF INTEREST, YOU WERE ASKED"
12410   PRINT P8"PARTICLE QUESTIONS,"W8"WAVE QUESTIONS, AND"F9"FIELD"
12420   PRINT "QUESTIONS."
12430   PRINT
12440   PRINT,"FINALLY, I HOPE YOUR PAPER ON "S$
12450   PRINT "IS AS SYSTEMATICALLY ORGANIZED AND POLISHED AS IT WAS"
12460   PRINT "SYSTEMATICALLY THOUGHT ABOUT TODAY."
12470   PRINT
12480   PRINT,,"CORDIALLY,"
12490   PRINT
12500   PRINT,,"A KINDRED CREATIVE SPIRIT"
12510   STOP
12520   PRINT
12530   PRINT
12540   PRINT "YOU MUST BE A DEEP THINKER, "N1$"."
```

```
12550   PRINT
12560   PRINT "YOU ONLY WERE ASKED";C;"QUESTIONS.  PLEASE COME BACK"
12570   PRINT "WHEN YOU CAN STAY LONGER.  BYE."
12580   STOP
12590   PRINT
12600   PRINT
12610   PRINT,"WHY, ";N1$;", YOU ARE IN A HURRY TODAY."
12620   PRINT
12630   PRINT,"YOU PROBABLY WILL HAVE TO SPEND MORE TIME"
12640   PRINT "THINKING ABOUT ";S$;"."
12650   PRINT
12660   PRINT,"SORRY I COULD NOT HELP YOU MORE.  BYE."
12670   STOP
12680   END
```

# APPENDIX C: Runs

```
[CREATING BASIC.LOG]
>RUN

TOPOI          15:25          20-FEB-79


                A COMPUTER-PROMPTED INVENTION PROGRAM:
                --------------------------------------

                        ARISTOTLE'S TOPICS
                        ------------------


                        HELLO AND WELCOME!

PLEASE TYPE IN YOUR FIRST NAME:  WALT

NOW, WALT, PLEASE TYPE IN YOUR LAST NAME:


WELL, WALT        , I HOPE I CAN BE OF SOME ASSISTANCE
TO YOU TODAY.  IF WE TAKE EACH OTHER SERIOUSLY, YOU'LL
THINK ABOUT YOUR TOPIC AS YOU NEVER HAVE BEFORE.


                BEFORE WE BEGIN, WALT.  THERE'S AN OLD
SAYING ABOUT COMPUTER-ASSISTED INSTRUCTION.  IT GOES:

                'GARBAGE IN, GARBAGE OUT!'

IN OTHER WORDS, YOU AND I MUST WORK TOGETHER SO
YOU CAN GET A GOOD START ON YOUR RESEARCH PAPER.


                                (PRESS 'RETURN' TO CONTINUE.)


WOULD YOU LIKE TO REVIEW THE DIRECTIONS AND THE COMMANDS?
                (YES OR NO?)
YES

                DIRECTIONS:


                1.  WHEN YOU MAKE A TYPING ERROR, WALT, AND
                WISH TO CORRECT IT, USE THE 'RUBOUT' OR 'RUB' KEY.
                THE 'SHIFT' MUST BE DEPRESSED WHEN YOU 'RUBOUT'.
                IT MAY LOOK A LITTLE FUNNY (LIKE WRITING BACKWARDS),
                BUT DON'T WORRY: IT WORKS THAT WAY.
```

2. REMEMBER THAT I CAN ONLY READ ABOUT A LINE AND
A HALF OF INFORMATION AT ONE TIME -- ABOUT THIS MUCH:

---

HIT 'RETURN' AT THAT POINT AND I'LL GENERALLY
LET YOU ADD MORE INFORMATION. IF THAT DOES NOT WORK,
TYPE '&&' AND I'LL SAY 'GO ON, #ALT.'

(PRESS 'RETURN' TO CONTINUE.)

3. AFTER YOU FINISH TYPING YOUR RESPONSE, YOU MUST PRESS
THE 'RETURN' KEY. WHEN YOU DO , I'LL READ YOUR
RESPONSE AND SAY SOMETHING BACK TO YOU.

4. THE MOST IMPORTANT OBJECTIVE OF THIS PROGRAM
IS TO GET YOU THINKING ABOUT YOUR TOPIC.

IN ORDER TO ACHIEVE THIS OBJECTIVE,
YOU ARE GOING TO HAVE TO FORGET THAT I AM A MACHINE.

PLEASE ASK QUESTIONS. YOU'LL BE SURPRISED BY HOW MUCH
I KNOW (OR SO I HOPE!) I'M NOT
GUARANTEEING THE TRUTH, BUT I'LL DO THE BEST I CAN.
MY MEMORY IS STILL DEVELOPING.

(HIT 'RETURN' TO CONTINUE.)

COMMANDS:

| TYPE IN--> | I'LL DO THIS--> |
|---|---|
| STOP! | I'LL STOP ASKING QUESTIONS AND CLOSE. |
| CONTINUE! | I'LL SKIP AHEAD TO THE NEXT QUESTION. |
| REPEAT! | I'LL REPEAT THE QUESTION. |
| DIRECTIONS! | I'LL SHOW YOU THESE DIRECTIONS AGAIN. |
| CHANGE! | I'LL LET YOU CHANGE OR NARROW YOUR SUBJECT. |
| ? | I'LL LET YOU ASK A QUESTION. |
| EXPLAIN! | I'LL EXPLAIN THE QUESTION.<br>(THIS ONE IS A LOT OF FUN, #ALT.) |
| && | I'LL LET YOU CONTINUE WITH YOUR RESPONSE. |

(PRESS 'RETURN' TO CONTINUE.)

TWO LAST THINGS:

*** THINK OF ME AS A PERSON WHO CAN ASK A LOT OF INTERESTING, THOUGHT-PROVOKING, AND WILD QUESTIONS.

*** SCREAM FOR HELP IF I START ACTING REALLY CRAZY!!

WOULD YOU LIKE A BRIEF EXPLANATION OF HOW ARISTOTLE'S TOPICS HELP WRITERS WRITE?
(YES OR NO?)
YES

I'M GLAD YOU ASKED, WALT. BRIEFLY, THE TWENTY-EIGHT ENTHYMEME TOPICS HELP A WRITER (OR A SPEAKER) DISCOVER SPECIFIC ARGUMENTS ABOUT SUBJECTS.

IN HIS 'RHETORIC', ARISTOTLE TELLS US THAT THE AIM OR GOAL OF RHETORIC IS TO PERSUADE AN AUDIENCE. REMEMBER THAT TERM -- PERSUADE.

ARISTOTLE BELIEVED THAT IF HIS STUDENTS IN THE ACADEMY KNEW AND PRACTICED USING THE TOPICS, THEY WOULD BECOME EFFECTIVE 'PERSUADERS.'

YOU'LL RECOGNIZE AMONG THE TOPICS:

1. QUESTIONS OF DEFINITION;
2. QUESTIONS ABOUT CAUSES AND EFFECTS;
3. QUESTIONS REGARDING OPPOSITES AND ASSOCIATIONS;
4. QUESTIONS ABOUT CONSEQUENCES;
5. AND QUESTIONS ABOUT MATTERS OF FACT AND OPINION.

(HIT 'RETURN' TO CONTINUE.)

NOW I NEED TO FIND OUT WHAT YOU ARE WRITING ABOUT, SO WOULD YOU PLEASE TYPE IN YOUR SUBJECT. I AM LOOKING FOR ONE TO THREE WORDS.

FEAR OF DEATH

HOLY ELECTRONICS! THAT'S WEIRD, I USED TO DATE A COMPUTER INTERESTED IN FEAR OF DEATH.

A COMMENT ABOUT PURPOSE:

DURING THIS EXPLORATION PROCESS,
YOU WILL BE ASKED TO CLARIFY THE PURPOSE OF
YOUR PAPER ON FEAR OF DEATH.

SO NOW WOULD YOU BRIEFLY DESCRIBE WHAT THE PURPOSE
OF YOUR PAPER BY COMPLETING
THIS STATEMENT: THE PURPOSE OF THIS PAPER IS TO. . . .

EXAMINE THE FEAR OF DEATH PEOPLE HAVE, WHERE WE GET THOSE FEARS ,

AND HOW WE MAY REDUCE THOSE FEARS

FINE, WALT, YOU AND I WILL TALK AGAIN ABOUT YOUR
PURPOSE.

RELAX NOW, WALT, AND ENJOY THIS BRAINSTORMING SESSION.

WHAT OBJECTS DO YOU ASSOCIATE
WITH FEAR OF DEATH? HOW MIGHT THEY
BE INCLUDED IN YOUR THEME?

FEAR OF THE UNKNOWN, CESSATION OF LIFE, FEAR OF CAUSING PAIN TO OUR LOVED ONES

THAT'S THE IDEA, WALT. GIVE ME SOME MORE INFO NOW.

PAIN IS ANOTHER FEAR CAUSER. KNOWING WE HAVE TO DIE DOES NOT RELIEVE
THE PAIN/FEAR OF DYING

SUPER, WALT!

ANYTHING ELSE?
(YOU CAN ADD MORE INFO, ASK A
QUESTION, OR GIVE A COMMAND --
WHATEVER YOU WISH.)

HOW DOES EUTHANASIA, MERCY KILLING , SUICIDE, MURDER AND ACCIDENTAL DEATH

ADD TO OUR FEARS?

I COULD SAY THAT THAT'S FOR ME TO KNOW AND FOR YOU TO FIND OUT.

SERIOUSLY, I CANNOT PRETEND TO KNOW 'HOW', BUT YOU
SHOULD KEEP EXPLORING FOR AN ANSWER.

CONTINUE!

(TRY EXPLAINING A LITTLE MORE. LESS PHRASES, MORE SENTENCES.)

WE'RE MOVING RIGHT ALONG. HERE IS QUESTION 2 .

WHAT COULD BE CONSIDERED A RESULT
OF FEAR OF DEATH?

NERVOUSNESS, DEPRESSION, SUICIDAL TENDENCIES

BY GEORGE, WALT, GOOD ONE. WRITE A LITTLE MORE PLEASE.

HATRED FOR THE PERSON WHO CAUSED THE DEATH, OR THE PERSON WHO DIED

FANTASTIC, WALT!

ANYTHING ELSE?
(YOU CAN ADD MORE INFO, ASK A
QUESTION, OR GIVE A COMMAND --
WHATEVER YOU WISH.)

CONTINUE!

OKAY.

DO YOU WISH TO NARROW OR CHANGE YOUR SUBJECT?
(MAYBE REVISE THE WAY IT SOUNDS IN THESE QUESTIONS?)
(YES OR NO?)
NO

(IF YOU NEED MORE ROOM, TYPE '66' AT THE END OF A LINE.)

HERE IS QUESTION 3 , WALT.

*HAT HAS BEEN DECIDED ABOUT FEAR OF DEATH
TO DATE.

EXPLAIN!

DECISIONS HAVE BEEN MADE ABOUT FEAR OF DEATH.
*HAT *ERE THEY ABOUT? *HO MADE THEM?

FOR EXAMPLE, IF I WERE WRITING A PAPER ABOUT INFLATION,
I *OULD *ANT TO WRITE A PARAGRAPH OR TWO ABOUT THE
GOVERNMENT'S LEGISLATION TO DATE.

TRY ANSWERING THIS QUESTION NOW.

CALIFORNIA HAS A NATURAL DEATH ACT *HICH ALLOWS PEOPLE TO DECIDE IF THE
ARE TO BE TAKEN OFF A LIFE SA

SO ON, *ALT.

SUPPORTING *ACHINE

GOOD, *ALT. ADD TO YOUR RESPONSE NOW.

PEOPLE HAVE HAD VARIOUS ORGANS TRANSPLANTED INTO THEM

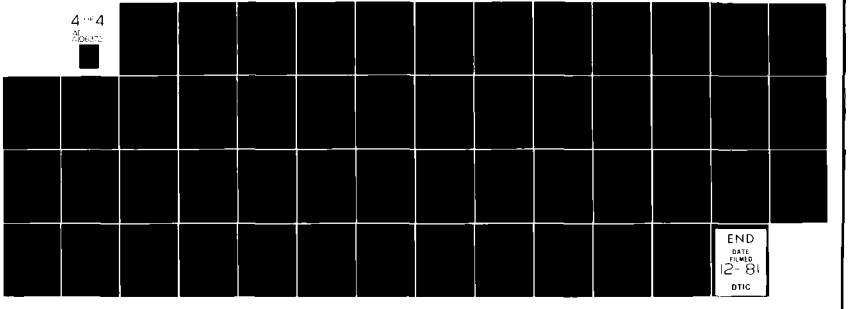
OUTSTANDING, *ALT!

YES, BUT I WANT YOU TO DISCUSS

*HAT?

THE LAST QUESTION

AD-A106 372 AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH F/G 5/9
STIMULATING RHETORICAL INVENTION IN ENGLISH COMPOSITION THROUGH--ETC(U)
AUG 79 H L BURNS
UNCLASSIFIED AFIT-CI-79-223D NL



FANTASTIC, #ALT!

ANYTHING ELSE?

REPEAT!

#HAT HAS BEEN DECIDED ABOUT FEAR OF DEATH
TO DATE.

KAREN ANN QUINLIN WAS TAKEN OFF LIFE SUPPORT EQUIPMENT TO DIE TO RELIEVE HER
FAMILYOF THE PAIN OF 66

GO ON, #ALT.

PROLONGING THE LIFE OF A VEGATABLE

OKAY.

(IF YOU DON'T UNDERSTAND, JUST SAY SO NEXT TIME. I'LL HELP.)

QUESTION 4 -- ONE OF MY ALL-TIME FAVORITES COMING UP.

*DEFINE FEAR OF DEATH.*

FEAR OF THE UNKNOWN, FEAR OF A NEW , DIFFERENT KIND OF LIFE. FEAR OF THE PAIN
OF DYING, AND FEAR OF LOSING66

GO ON, #ALT.

OUR IMMORTALITY

HMM. #ALT, ADD TO YOUR RESPONSE #CW.

#OT UNDERSTANDING #HY MOMMY OR DADDY IS NO LONGER #ITH US IS SOMETHING #E
OFTEN FIND HARD TO COPE #ITH

SUPER, #ALT!

ANYTHING ELSE?

YES, FEAR OF DYING IN UNUSUAL SURROUNDINGS, AND #HERE #E DONT KNOW THOSE
AROUND IS AND THEY DONT KNOW I.

#HAT?

EXPLAIN!

YOU #IGHT SPEND ALL DAY ON THIS QUESTION, BUT I AM
AFTER A SHORT DEFINITION. IN LESS THAN TWENTY #ORDS,
#HAT IS FEAR OF DEATH?

YOUR TURN, #ALT.

FEAR OF THE UNKNOWN

FANTASTIC, #ALT!

ANYTHING ELSE?

FEAR OF PAIN

OKAY.

(SEE IF YOU CAN USE SOME MORE ACTION VERBS IN YOUR RESPONSE.)

AND HERE COMES A REALLY INTERESTING QUESTION -- NUMBER 5 .

#HAT COULD BE CONSIDERED A CAUSE
OF FEAR OF DEATH?

NOT BEING EXPOSED TO DEATH PROPERLY WHEN #E FIRST EXPERIENCE IT

GOOD, #ALT, ADD TO YOUR RESPONSE NOW.

SEEING SOMEONE DIE IN A TRAGIC ACCIDENT

SUPER, #ALT!

ANYTHING ELSE?

#OT BEING #ITH OUR LOVED ONES TO PLAY #ITH THEM AND GO THE PLACES #HERE #E ENJOYED
OURSELVES

#HAT?

EXPLAIN!

THIS QUESTION IS ABOUT CAUSES AND EFFECTS, BUT YOUR ANSWER
SHOULD JUST MENTION THE CAUSES, THE REASONS,
THE 'WHYS' REGARDING FEAR OF DEATH.

FOR EXAMPLE, IF I WERE WRITING ABOUT HUMAN RIGHTS PROGRAMS,
I #OULD #RITE SOMETHING ABOUT THE
OUTRAGES OF RACISM OUR #ORLD HAS WITNESSED.

TRY ANSWERING THIS QUESTION NOW.

BEING AFFRAID OF LEAVING OUR FRIENDS IS A VALID CAUSE OF FEARING DEATH I THINK.

#UAT ELSE?

#FS, THAT SEEMS OKAY.

#OUR TURN, #ALT.

CONTINUE!

BEFORE WE CONTINUE, WALT, I WANT YOU
TO THINK ABOUT YOUR PURPOSE UNCL AGAIN.

YOU HAVE ALREADY TOLD ME THAT YOUR PURPOSE WAS
TO EXAMINE THE FEAR OF DEATH PEOPLE HAVE, WHERE WE GET THOSE FEARS , AND
HOW WE MAY REDUCE THOSE FEARS.

NOW WOULD YOU COMPLETE THIS STATEMENT:

IF NOTHING ELSE, I WANT MY READER TO UNDERSTAND. . . .

DEATH IS NOT TO BE FEARED. IT IS A FACT OF LIFE AND SHOULD BE DEALT WITH IN THAT CONTEXT

OKAY, FINE. KEEP YOUR PURPOSE IN MIND AS WE CONTINUE.

HERE IS YOUR NEXT QUESTION -- NUMBER 6 .

WHAT SPECIAL EXPERIENCES MADE YOU SELECT
FEAR OF DEATH AS YOUR TOPIC?

RELIGIOUS EDUCATION CONFERENCE WHERE A NUN FROM SETON HOSPITAL GAVE A TALK TO MY STUDENTS

THAT'S THE IDEA, WALT. GIVE ME SOME MORE INFO NOW.

I HAVE WONDERED WHY PEOPLE HAVE SUCH A FEAR OF WHAT THEY DONT KNOW AND CANT DO SOMETHING
ABOUT, LIKE MY FEAR &&
GO ON, WALT.

OF SWIMMING

OUTSTANDING, WALT!

ANYTHING ELSE?
DEALING WITH OTHERS IN THE FUTURE WHEN THEY LOSE A LOVED ONE WILL BE MUCH EASIER IF I
UNDERSTAND WHAT THEIR FEARS &&
GO ON, WALT.

APE

OKAY.

(I REPEAT QUESTIONS IF YOU TYPE 'REPEAT!')

```
HERE IS QUESTION 7 , WALT.

WHAT STILL MUST BE DECIDED ABOUT
FEAR OF DEATH?  DESCRIBE.


CONTINUE!


DO YOU WISH TO NARROW OR CHANGE YOUR SUBJECT?
(MAYBE REVISE THE WAY IT SOUNDS IN THESE QUESTIONS?)
                (YES OR NO?)
NO




(TRY USING SOME MORE VERBS FOR BETTER EXPLANATIONS.)



QUESTION 8 -- ONE OF MY ALL-TIME FAVORITES COMING UP.

FILL IN THE BLANK:  IF FEAR OF DEATH,
THEN _____.


STOP!

              YOU EXPLORED 8 QUESTIONS OUT OF THE 8 I ASKED.
              THAT'S 100 PERCENT.

              LET ME REMIND YOU THAT YOU ARE STILL IN THE FIRST STAGES
              OF THE CREATIVE PROCESS.  THESE IDEAS MUST SIMMER NOW.

              ALSO, I HOPE YOU CAN CREATE SOME OF YOUR OWN 'TOPIC'
              QUESTIONS.  I WON'T ALWAYS BE AROUND TO HELP!!!

                           HOPE YOUR PAPER IS TERRIFIC!

                           GOOD BYE & GOOD LUCK!


TIME:  27.90 SECS.
>NOLOG
(CLOSING BASIC.LOG)
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[CREATING BASIC.LOG]
>RUN

BURKE          14:42          20-FEB-79



                A COMPUTER-ASSISTED INVENTION PROGRAM:
                --------------------------------------

                     BURKE'S DRAMATISTIC PENTAD
                     --------------------------



                GREETINGS!  WELCOME TO CAI-PROMPTED INVENTION.

PLEASE TYPE IN YOUR FIRST NAME:  ROBYN

NOW, ROBYN, PLEASE TYPE IN YOUR LAST NAME:

THANK YOU, ROBYN      .  I HOPE I CAN BE OF SOME
ASSISTANCE TO YOU TODAY.  IF WE TAKE EACH OTHER SERIOUSLY,
I KNOW YOU'LL THINK ABOUT YOUR TOPIC AS YOU NEVER HAVE BEFORE.

                BEFORE WE BEGIN, ROBYN, THERE'S AN OLD
SAYING ABOUT COMPUTER-ASSISTED INSTRUCTION.  IT GOES:

                'GARBAGE IN, GARBAGE OUT!'

IN OTHER WORDS, YOU AND I HAVE GOT TO WORK TOGETHER SO
YOU CAN GET A GOOD START ON YOUR RESEARCH PAPER.



                (PRESS 'RETURN' TO CONTINUE.)



WOULD YOU LIKE TO REVIEW THE DIRECTIONS AND COMMANDS?
                (YES OR NO?)
NO


WOULD YOU LIKE TO REVIEW KENNETH BURKE'S PENTAD?
                (YES OR NO?)
NO
```

NOW I NEED TO FIND OUT WHAT YOU
ARE WRITING ABOUT, SO WOULD YOU PLEASE TYPE IN YOUR
SUBJECT. I AM LOOKING FOR ONE TO THREE WORDS.

SEX DIFFERENCES

BE SURE TO ASK THE REFERENCE LIBRARIAN ABOUT THE RECENT
RESEARCH ON SEX DIFFERENCES. YOU'LL BE
WELL-REWARDED.

(HIT 'RETURN' TO CONTINUE.)

A COMMENT ABOUT YOUR PURPOSE:

DURING THIS EXPLORATION PROCESS,
YOU WILL BE ASKED TO CLARIFY THE PURPOSE OF
YOUR PAPER ON SEX DIFFERENCES.

SO NOW WOULD YOU BRIEFLY DESCRIBE THE PURPOSE
OF YOUR PAPER BY COMPLETING THIS STATEMENT:

THE PURPOSE OF MY PAPER IS TO. . . .

TO ESTABLISH WHETHER DIFFERENCES REALLY EXIST BETWEEN MEN AND WOMEN

FINE, ROBYN. YOU AND I WILL TALK AGAIN ABOUT YOUR
PURPOSE.

RELAX NOW, ROBYN, AND ENJOY THIS EXPLORATION OF
SEX DIFFERENCES.

WHAT SOLUTIONS COULD YOU RECOMMEND FOR ANY PROBLEMS
CAUSED BY SEX DIFFERENCES?

DIFFERENCT TEACHING METHODS FOR DIFFERENT CHILDREN.

THAT'S THE IDEA, ROBYN. GIVE ME SOME MORE INFO NOW.

THE WHOLE MODERN DAY PROBLEM OF DICRIMINATIN

GREAT, ROBYN!

ANYTHING ELSE?
(YOU CAN ADD MORE INFO, ASK A
QUESTION, OR GIVE A COMMAND --
WHATEVER YOU WISH.)

NO

OKAY.

(USE GOOD, STRONG, ACTION VERBS WHEN YOU CAN.)

HERE IS QUESTION 2 , ROBYN.

WHO ESPECIALLY CARES ABOUT SEX DIFFERENCES?
EXPLAIN THEIR REASONS.

ALL PEOPLE , BOTH MEN AND OMEN SHOULD CARE AOUT SIx DIFFERENCES, BECAUSE THEY AA

GO ON, ROBYN.

ARE AL A PART OF IT.

FINE, ROBYN. WRITE SOME MORE.

CONTINUE!

DO YOU WISH TO CHANGE OR NARROW YOUR SUBJECT?
(YES OR NO?)
NO

AND HERE COMES A REALLY INTERESTING QUESTION--NUMBER 3 .

DESCRIBE SOCIETY'S ATTITUDE TOWARD
SEX DIFFERENCES.

THAT IS A QUESTION TO WHICH I DONBT KNOW TH EANSWER. THAT IS WHAT IMTRYING TO FIND OUT

BY 'SOCIETY'S ATTITUDE' I MEAN WHAT DO
PEOPLE IN GENERAL THINK ABOUT SEX DIFFERENCES.

FOR EXAMPLE, IF I WERE WRITING ABOUT A CONTROVERSIAL
TOPIC (SAY 'ABORTION'), I WOULD WANT TO WRITE SOMETHING
ABOUT PEOPLE'S VARIED VIEWPOINTS.

WHAT ARE YOU THINKING NOW, ROBYN?

WELL, I GUESS THAT MEN THINK THAT THEY ARE THE SERIOR SEX ANS WOMEN THENIN\

THAT'S THE IDEA, ROBYN. GIVE ME SOME MORE INFO NOW.

MEN TEND TO BE MORE MECHANICALLY INCLINED AND ARE INTERESTED IN THAT TYPE OF THING &&

GO ON, ROBYN.

WHEREAS WOMEN RE THE MOTHERLY TYPE THAT LIKE TO CARE FOR CHILDREN ETC

GREAT, ROBYN!

ANYTHING ELSE?
(YOU CAN ADD MORE INFO, ASK A
QUESTION, OR GIVE A COMMAND --
WHATEVER YOU WISH.)

CONTINUE!

OKAY.

(IF YOU DON'T UNDERSTAND A QUESTION, JUST SAY SO. I'LL HELP.)

WE'RE MOVING RIGHT ALONG. HERE IS QUESTION 4 .

WHERE DOES SEX DIFFERENCES OCCUR? DESCRIBE.

I SEE T"HEM OCCURING MOSTLY IN THE BIG ORGANIZATIONS -- SCHOOLS, WORK, SPORTS

BY GEORGE, ROBYN, GOOD ONE. WRITE A LITTLE MORE PLEASE.

LARGE ORGANIZATIONS HAVE A SCRICT RULE SET ANS WHEN THESE SONT AGREE WITH MEN ORWOMENS &&

GO ON, ROBYN.

VIEWPOINTS, CONFLICT OCCURS

SUPER, ROBYN!

ANYTHING ELSE?

NO, I HADNT TOUGHT ABOUT IT TOO MUCH

OKAY.

(I'LL EXPLAIN A QUESTION IF YOU TYPE 'EXPLAIN!')

QUESTION 5 --ONE OF MY ALL-TIME FAVORITES COMING UP.

DESCRIBE OR LIST WHAT OTHERS MAY NOT KNOW
ABOUT SEX DIFFERENCES.

MOST PEOPLE, INCLUDING MYSELF, UNDERSTAND_ , DONOT UNDERSTAND THE BIOLOGICAL FACTORS THAT CONT&&
GO ON, ROBYN.

DONT UNDERSTAND THE BIOLOGICA FACTORS THAT CONTROL MENT AND WOMENS ACTIONS, EMOTIONS ETC

BY GEORGE, ROBYN, GOOD ONE. WRITE A LITTLE MORE PLEASE.

PEOPLE NEED TO KNOW HOW MUCH HEREDITY CONTROLS MOTIVAIN , INTELLIGENCE, SPECIAL SILLS

SUPER, ROBYN!

ANYTHING ELSE?

NO CONTINUE!

OKAY.

BEFORE WE CONTINUE, ROBYN, I WANT YOU
TO THINK ABOUT YOUR PURPOSE ONCE AGAIN.

YOU HAVE ALREADY TOLD ME THAT YOUR PURPOSE WAS
TO TO ESTABLISH WHETHER DIFFERENCES REALLY EXIST BETWEEN MEN AND WOMEN.

NOW HOW WOULD YOU COMPLETE THIS STATEMENT:

IF NOTHING ELSE, I WANT MY READER TO UNDERSTAND. . . .

THAT YES, DIFFERENCES DO EXIST, AND THAT THESE DIFFERENCES OUTHT TO BE IN OUR

OKAY, GOOD. KEEP PURPOSE IN MIND AS WE CONTINUE.

HERE IS YOUR NEXT QUESTION -- NUMBER 6 .

#HAT REASONS CAN YOU LIST FOR THE EXISTENCE
OF SEX DIFFERENCES?

BIOLOGICAL, HEREDITY, EVIORNMENTAL, CLTURAL, AND OF COURSE, PLAIN DIFFERENCES

THAT'S THE IDEA, ROBYN. GIVE ME SOME MORE INFO NOW.

EXPLAIN!

#HY DOES SEX DIFFERENCES DEMAND OUR
ATTENTION IN THIS DAY AND AGE. #HAT REASONS CAN YOU
GIVE FOR THE IMPORTANCE OF YOUR TOPIC?

YOUR TURN, ROBYN.

IT IS A IMPORTANT TOPIC BECAUSE THE FACTOR OF DISCRIMINTAION IS SO PREVALENT TODAY

I LIKE YOUR REASONING.
OUTSTANDING, ROBYN!

ANYTHING ELSE?

NO CONTINUE!

OKAY.

(IF YOU DON'T UNDERSTAND A QUESTION, JUST SAY SO. I'LL HELP.)

WE'RE MOVING RIGHT ALONG. HERE IS QUESTION 7 .

DOES EVERYONE AGREE THAT SEX DIFFERENCES HAS
THE SAME PURPOSE? EXPLAIN ANY DIFFERENCES.

EXPLAIN!

WHEN THERE IS A DISAGREEMENT ABOUT THE FINAL PURPOSE
OF A PARTICULAR ACTION, USUALLY NOT EVERYONE AGREES
ABOUT THE ULTIMATE PURPOSE. IF THERE ARE DIFFERENCES
ABOUT WHAT SHOULD HAPPEN, DESCRIBE THEM.
CERTAINLY, SEX DIFFERENCES IS SUCH A TOPIC.

WHAT ARE YOU THINKING NOW, ROBYN?

I STILL DONT TINK I UNDERSTAND PLEASE EXPLAIN!

THAT'S ABOUT ALL I CAN ADD AT THE MOMENT. SORRY!

WHAT ARE YOU THINKING NOW, ROBYN?

OKAY. I DN@T UNDERSTAND PLEASE CONTINUE!

DO YOU WISH TO CHANGE OR NARROW YOUR SUBJECT?
(YES OR NO?)
NO

QUESTION 8 --ONE OF MY ALL-TIME FAVORITES COMING UP.

IS THE SETTING AROUND SEX DIFFERENCES UNIQUE?
WHAT MAKES IT SO?

YES BECAUSE IT INVOLVES SO MAY PEOPLE -- ALL IN FACT

I LIKE YOUR REASONING.
GOOD, ROBIN. ADD TO YOUR RESPONSE NOW.

IT IS ALOS TOUCCHY BECAUSE PEOPLE GET OFFENCED WHEN YOU START TALKING ABOUT SOMETHING &&

GO ON, ROBYN.

SO BASIC IN THIER PERSONALITY

SUPER, ROBYN!

ANYTHING ELSE?
NO CONTINUE!

OKAY.

(USE GOOD, STRONG, ACTION VERBS WHEN YOU CAN.)

HERE IS QUESTION 9 , ROBYN.

HOW IS SEX DIFFERENCES LIKE MERCURY
IN A THERMOMETER? EXPLAIN.

EXPLAIN!

THIS ANALOGY IS ONE OF MANY I COULD HAVE ASKED YOU.
ONE WAY TO LOOK AT IT WOULD BE TO DESCRIBE HOW
SEX DIFFERENCES REACTS TO AND
MEASURES ITS SURROUNDINGS. YOU CAN PROBABLY THINK
OF ANOTHER INTERPRETATION AS WELL.

YOUR TURN, ROBYN.

SEX DIFFERENCES IS CONSTATNTLY AROUND, IMPOSING ON OUR LIVES, POSSIBLY TRHREATENING
SOME PUEPLE

GOOD, ROBYN. ADD TO YOUR RESPONSE NOW.

I TSEEMS THAT WE, AT LEAST IN MAERICA, ARE CONSTANTLY ANALYSING OUR ROLES IN OUR EVERdd

GO ON, ROBYN.

CHANGING SOCIETY. THERE SEEMS TO BE AN BIGUITY IN THESE ROLES

TERRIFIC, ROBYN!

ANYTHING ELSE?

NO CONTINUE!

OKAY.

(I'LL EXPLAIN A QUESTION IF YOU TYPE 'EXPLAIN!')

WE'RE MOVING RIGHT ALONG. HERE IS QUESTION 10 .

WHAT ECONOMIC OR POLITICAL CAUSES HELP CREATE
SEX DIFFERENCES? DESCRIBE.

IT IS ESTABLISHED IN OUR SOCIETY THAT THE WOMEN WORKS AT HOME AND THE MAN WORKS
AT THE OFFICE

GOOD, ROBYN. ADD TO YOUR RESPONSE NOW.

IT SEMS THAT SOME OF OUR LAWS APE STILL PURINTANICAL IN REGARDS TO WOMENT RIGHTS

TERRIFIC, ROBYN!

ANYTHING ELSE?

TYING IT AL IN, IF A WOMEN IS ACCUSTOMED TO HEING SUPPURTED, AND HERE HUSRAND ISTHE SUPPURTER &&

GO ON, RUBYN.

THEN, WHEN AND IF SHE EVER LEFT HIM, THE SAWS AND SO CIETY WUNT HELP HER

OKAY.

(REMEMBER COMMANDS NEED EXCLAMATION MARKS!! LIKE 'REPEAT!'....)

AND HERE CUMES A REALLY INTERESTING QUESTION--NUMBER 11 .

WHAT CAUSES SEX DIFFERENCES? EXPLAIN.

WE TALKED ABOUT HTAT EARLIER. I CONT REALLY KNOW SINCE I HAVENT RESEARCHED IT YET &&

GO ON, ROBYN.

HIOLOGICAL FACTORS. HEREDITY, CULTURAL FACTORS.

BY GEORGE, ROBYN, GOOD ONE. WRITE A LITTLE MORE PLEASE.

ANUTHER REASON MIGHT BE MENS AND WOMENT ACTUAL ATTITUDES TOWARD THE OPPOSITE SEX

GREAT. RUBYN!

ANYTHING ELSE?

NO CONTINUE!

OKAY.

LET'S PAUSE ONCE AGAIN TO CONSIDER YOUR INTENT.

YOUR GENERAL PURPOSE IS TO
TO ESTABLISH WHETHER DIFFERENCES REALLY EXIST RETWEEN MEN AND WOMEN.

ALSO, YOU WANT YOUR READER TO UNDERSTAND
THAT IFS, DIFFERENCES DO EXIST, AND THAT THESE DIFFERENCES OUTHT TO BE I
N OUR.

IS THERE ANYTHING ELSE YOU WISH TO SAY ABOUT YOUR PURPOSE?
(YES OR NO?)
YES. THIS PAPER IS INTENDED TO BE PERSUASIVE. TO SHOW THAT THE UNDERSTANDING THAT SEX DIFFERENCES 66
GREAT, ROBYN, WHAT WOULD YOU LIKE TO ADD?

IS IMPORTANT IN THE WHOLE REALM OF HUMAN RELATINS

OKAY, GOOD. KEEP PURPOSE IN MIND AS WE CONTINUE.

HERE IS YOUR NEXT QUESTION -- NUMBER 12 .

WHAT TOOLS, WEAPONS, INSTRUMENTS DO YOU NEED TO CHANGE ATTITUDES ABOUT SEX DIFFERENCES? DESCRIBE.

STOP:

YOU EXPLORED 9 QUESTIONS IN THESE FEW MINUTES.
BUT YOU ARE NOT FINISHED INVENTING YET.

YOU ARE STILL IN THE FIRST STAGES
OF THE CREATIVE PROCESS. THE IDEAS YOU HAVE COME
UP WITH, ROBYN, NOW NEED TO SIMMER FOR A LITTLE
TIME.

I HOPE THAT YOU CAN NOW 'GENERATE' YOUR OWN QUESTIONS
FROM BURKE'S FIVE PERSPECTIVES. DON'T NEGLECT THE
RATIOS AS YOU WRITE YOUR PAPER.

I HOPE YOUR PAPER ON SEX DIFFERENCES
IS TERRIFIC.

GOOD BYE, ROBYN.

TIME: 36.10 SECS.
>NOLOG
(CLOSING BASIC.LOG)

```
(CREATING BASIC.LOG)
>RUN

TASI          16:26          20-FEB-79



          A COMPUTER-ASSISTED INVENTION PROGRAM:
          --------------------------------------

                    THE TASMENIC MATRIX
                    -------------------



          HI!  WELCOME TO CAI-PROMPTED EXPLORATION.

PLEASE TYPE IN YOUR FIRST NAME:  RICK

NOW, RICK, PLEASE TYPE IN YOUR LAST NAME:

THANK YOU, RICK          .  I HOPE I CAN BE OF SOME
ASSISTANCE TO YOU TODAY.  IF WE TAKE EACH OTHER SERIOUSLY,
I KNOW YOU'LL THINK ABOUT YOUR TOPIC AS YOU NEVER HAVE BEFORE.


          BEFORE WE BEGIN, RICK,  THERE'S AN OLD
SAYING ABOUT COMPUTER-ASSISTED INSTRUCTION,  IT GOES:

          'GARBAGE IN, GARBAGE OUT!'

IN OTHER WORDS, YOU AND I MUST COOPERATE SO THAT
YOU CAN GET A GOOD START ON YOUR RESEARCH PAPER.


                         (PRESS 'RETURN' TO CONTINUE.)


WOULD YOU LIKE TO REVIEW THE DIRECTIONS AND THE COMMANDS?
          (YES OR NO?)
NO




DO YOU WISH TO SEE A SHORT DESCRIPTION OF THE TASMENIC MATRIX?
          (YES OR NO?)
YES


          THE TASMENIC MATRIX HEURISTIC:
```

BRIEFLY, THE TAGMEMIC MATRIX ENCOURAGES A WRITER TO THINK ABOUT A TOPIC FROM NINE PERSPECTIVES.

FOR THIS PROGRAM, HOWEVER, I HAVE SIMPLIFIED THIS A BIT. THIS PROGRAM WILL ASK YOU QUESTIONS FROM ONLY THREE PERSPECTIVES, WHICH YOU WILL RECALL FROM OUR CLASS DISCUSSION.

1. PARTICLE -- VIEWING A SUBJECT IN ITSELF (STATIC);

2. WAVE -- VIEWING A SUBJECT AS IT CHANGES (DYNAMIC); AND

3. FIELD -- VIEWING A SUBJECT'S RELATIONSHIP TO OTHER SUBJECTS (IN A SYSTEM).

(HIT 'RETURN' TO CONTINUE.)

NOW I MUST ASK YOU WHAT YOU ARE WRITING ABOUT. SO WOULD YOU PLEASE TYPE IN YOUR SUBJECT. (I AM LOOKING FOR ONE TO THREE WORDS, MAYBE FOUR.)

COMPUTERS

HEY, THAT'S COOL, RICK! WE'LL HAVE A GOOD TIME BRAINSTORMING COMPUTERS.

(HIT 'RETURN' TO CONTINUE.)

A COMMENT ABOUT YOUR PURPOSE:

WRITING WITHOUT A PURPOSE OR AIM, RICK, IS QUITE FRANKLY A WASTE OF TIME. DOING SO GENERATES VERBAL FOG, DESTROYS WRITING EFFICIENCY, AND DEFEATS THE ESSENCE OF COMMUNICATION.

THEREFORE, THROUGHOUT THIS EXPLORATION PROCESS, YOU WILL BE ASKED TO WRITE ABOUT THE PURPOSE OF YOUR PAPER ON COMPUTERS.

SO NOW WOULD YOU BRIEFLY DESCRIBE THE PURPOSE OF YOUR PAPER BY COMPLETING THIS STATEMENT:

THE PURPOSE OF MY PAPER IS TO. . . .

FIND THE ADVANTAGES AND DISADVANTAGES OF COMPUTERS

FINE, RICK, YOU AND I WILL TALK AGAIN ABOUT YOUR PURPOSE.

HERE WE GO. RELAX AND ENJOY THE MIND-STRETCHING!

DESCRIBE HOW COMPUTERS PHYSICALLY CHANGES.

EXPLAIN!

LOOKING FOR YOUR NOTIONS ABOUT THE DEVELOPMENT OF COMPUTERS. . . .

FOR EXAMPLE, IF I WERE WRITING ABOUT HUMAN DEVELOPMENT, I WOULD WRITE ABOUT GROWTH, CHANGES DUE TO MATURING--ADULT 'PASSAGES' HAVE BEEN POPULAR FARE LATELY.

YOUR TURN, RICK.

NEW TECHNOLOGY AND ADVANCES IN HUMAN RESEARCH

GOOD, RICK. ADD TO YOUR RESPONSE NOW.

COMPUTERS CONSTANTLY BETTERING THE IDEAS OF MAN

TERRIFIC, RICK!

ANYTHING ELSE?
(YOU CAN ADD MORE INFO, ASK A
QUESTION, OR GIVE A COMMAND --
WHATEVER YOU WISH.)

CONTINUE!

O K A Y .

(REMEMBER COMMANDS NEED EXCLAMATION MARKS, LIKE 'REPEAT!)

QUESTION 2 -- ONE OF MY FAVORITES -- COMING UP.

HOW ARE THE CHUNKS OR COMPONENTS OF COMPUTERS
ORGANIZED IN RELATION TO ONE ANOTHER? DESCRIBE.

*THE COMPUTER HAS* A CENTRAL PROCESSER WHICH IS THE CENTRAL CORE AND RUNS MOST OF THE
PROGRAMS

BY GEORGE, RICK, GOOD ONE. A LITTLE MORE PLEASE.

OTHER PARTS ARE MEMORY AND STORAGE DEVICES

TERRIFIC, RICK!

ANYTHING ELSE?
(YOU CAN ADD MORE INFO, ASK A
QUESTION, OR GIVE A COMMAND --
WHATEVER YOU WISH.)

CONTINUE!

O K A Y .

DO YOU WISH TO NARROW OR CHANGE YOUR SUBJECT?
MAYBE REVISE THE WAY IT SOUNDS IN THESE QUESTIONS?
(YES OR NO?)

NO

(ALL IDEAS ARE GOOD IDEAS; TYPE IN WHAT YOU THINK!!!)

HERE COMES AN INTERESTING ONE -- NUMBER 3 .

WHAT FEATURES OF COMPUTERS REMAIN THE SAME
OVER TIME?

THEY KEEP MOST OF THE SAME INFO BUT ADD MORE LATER ON

THAT'S THE IDEA, RICK. GIVE ME SOME MORE INFO.

BUT INTERNAL PARTS ARE CHANGING ALL THE TIME FOR THE BETTER

TERRIFIC, RICK!

ANYTHING ELSE?

NO

O K A Y .

(AFTER THE NEXT QUESTION, TYPE 'WHAT?' AND I'LL DO MY THING.)

YOUR NEXT QUESTION IS NUMBER 4 .

TAKE A MENTAL PHOTOGRAPH OF COMPUTERS. DESCRIBE
ONE IMPORTANT DETAIL.

WHAT?

CONCENTRATE NOW ON SEEING COMPUTERS,
WHAT FEATURE STANDS OUT THE MOST? DESCRIBE.

FOR EXAMPLE, IF I WERE WRITING ABOUT UFO SIGHTINGS,
I WOULD VISUALIZE ALIEN WORLDS AND STRANGE SAUCER-SHAPED
SPACECRAFT. LOTS OF INTERESTING DETAILS IN SUCH A TOPIC.

YOUR TURN, RICK.

COMPUTERS BECOMING SMALLER AND SMALLER WITH MORE CAPIBILITIES

GOOD, RICK. ADD TO YOUR RESPONSE NOW.

COMPUTERS BING ABLE TO BE IN THE EVERY DAY HOME

TERRIFIC, RICK!

ANYTHING ELSE?

NO

O K A Y .

(USE SOME STRONG VERBS IN YOUR ANSWERS WHEN YOU CAN.)

LET'S SEE. HOW ABOUT QUESTION 5 NEXT. HERE YOU ARE.

WHAT IS THE MOST OUTSTANDING PHYSICAL FEATURE OF COMPUTERS?

THEY ARE ABLE TO PRINT OUT MUCH INFO WITH GRAPHS AND CARDS AND PAPER

THAT'S THE IDEA, RICK. GIVE ME SOME MORE INFO.

THEY ARE ALSO GETTING MORE RELIABLE AND SMALLER AT THE SAME TIME

TERRIFIC, RICK!

ANYTHING ELSE?

NO

O K A Y .

BEFORE WE CONTINUE, RICK, I WANT YOU TO THINK ABOUT YOUR PURPOSE ONCE AGAIN.

YOU HAVE ALREADY TOLD ME THAT YOUR PURPOSE WAS TO FIND THE ADVANTAGES AND DISADVANTAGES OF COMPUTERS.

NOW HOW WOULD YOU COMPLETE THIS STATEMENT:

IF NOTHING ELSE, I WANT MY READER TO. . . .

UNDERSTAND THE COMPUTER MORE AND NOT BE AFRAID OF IT OR ITS CONSEQUENCES

OKAY. GOOD. LET'S KEEP YOUR PURPOSE IN MIND.

HERE IS YOUR NEXT QUESTION -- NUMBER 6 .

DESCRIBE THE SPIRITUAL CHARACTERISTICS OF COMPUTERS.

EXPLAIN!

AN ANSWER HERE MAY TAKE SOME IMAGINATION. IT COULD
REFER TO THE INTANGIBLE, UNREAL, PERHAPS EVEN SUPERFICIAL
ASPECTS OF COMPUTERS.

YOUR TURN, RICK.

PEOPLE COULD LOOK TO THE COMPUTER TO HELP THEM IN DICISIONS

GOOD, RICK. ADD TO YOUR RESPONSE NOW.

HELP PEOLE COPE WITH EVERY DAY LIVE

FANTASTIC, RICK!

ANYTHING ELSE?

NO

O K A Y .

(REASONS ARE VERY IMPORTANT) DON'T NEGLECT TYPING THEM IN.)

LET'S SEE. HOW ABOUT QUESTION 7 NEXT. HERE YOU ARE.

WHAT SYSTEM OF BELIEFS SURROUND COMPUTERS?
ELABORATE.

PEOPLE ARE OFTEN SCARED OF THEM BECAUSE THEY THINK THE COMPUTER COULD TAKE OVER THEIR JOB

THAT'S AN INTERESTING REASON.
FINE, RICK. WRITE SOME MORE.

THEY WONDER IF COMPUTERS CNA REALLY THINK

SUPER, RICK!

ANYTHING ELSE?

IF COMPUTERS CAN REALLY HELP MAN WITHOUT DESTROYING HIM

O K A Y .

DO YOU WISH TO NARROW OR CHANGE YOUR SUBJECT?
MAYBE REVISE THE WAY IT SOUNDS IN THESE QUESTIONS?

(YES OR NOT)
NO

(IF YOU DON'T UNDERSTAND, SAY SO, I'LL TRY TO HELP.)

WE'RE MOVING RIGHT ALONG. HERE IS QUESTION 8 .

HOW IS COMPUTERS LIKE A PAGE IN A BLUEPRINT?
DESCRIBE.

EXPLAIN!

AN ANALOGY OF THE 'FIELD' PERSPECTIVE--HOW IS
COMPUTERS LIKE A PLAN FOR SOMETHING?

WHAT ARE YOU THINKING, RICK?

THEY CAN HELP FOR PLANNING FUTURE TINGS

THAT'S THE IDEA, RICK. GIVE ME SOME MORE INFO.

CONTINUE!

(HEY, RICK, I'M ENJOYING THIS. KEEP ON TRUCKIN'!)

YOUR NEXT QUESTION IS NUMBER 9 .

VIEW COMPUTERS AS AN ABSTRACT, MULTI-DIMENSIONAL
SYSTEM. WHAT DOES THIS PERSPECTIVE SUGGEST?

EXPLAIN!

IS THERE A SOLAR SYSTEM (SO TO SPEAK) OF COMPUTERS?

YOUR TURN, RICK.

YES THERE ARE MANY KINDS OF COOPUTERS WHICH CAN DO MANY THINGS

BY GEORGE, RICK, GOOD ONE. A LITTLE MORE PLEASE.

THERE ARE MANY DIFFERENT TYPES OF LANGUAGES FOR COMPUTERS AND THEY WILL DO DIFFERENT
THINGS

OUTSTANDING, RICK!

ANYTHING ELSE?

NO

O K A Y .

(SEE IF YOU CAN USE THE WORD 'BECAUSE' IN YOUR NEXT ANSWER.)

YOUR NEXT QUESTION IS NUMBER 10 .

DESCRIBE THE HISTORICAL CHARACTERISTICS OF
COMPUTERS.

COMPUTERS TOOK A WHILE TO CONSTRUCCT BECAUSE PEOPLE DID NOT HAVE THE MACCHINERY
TO BUILD THEM

THAT'S AN INTERESTING REASON.
GOOD, RICK. ADD TO YOUR RESPONSE NOW.

NOE WITH NEW ELECTRONIC EQUIPMENT COMPUTERS ARE BEING BUILT MUCH EASIER

FANTASTIC, RICK!

ANYTHING ELSE?

NO

O K A Y .

(IF YOU DON'T UNDERSTAND, SAY SO. I'LL TRY TO HELP.)

YOUR NEXT QUESTION IS NUMBER 11 .

IS COMPUTERS BEST ARRANGED BY SPACE, TIME, OR
CLASS?

TIME AND CLASS

BY GEORGE, RICK, GOOD ONE. A LITTLE MORE PLEASE.

COMPUTERS CAN SAVE MAN VERY MUCH TIME BECAUSE THEY WORK VERY FAST

THAT'S AN INTERESTING REASON.
OUTSTANDING, RICK!

ANYTHING ELSE?

NO

O K A Y .

LET'S PAUSE ONCE AGAIN TO CONSIDER YOUR INTENT.

YOUR GENERAL PURPOSE IS TO
FIND THE ADVANTAGES AND DISADVANTAGES OF COMPUTERS.

ALSO, YOU WANT YOUR READER TO
UNDERSTAND THE COMPUTER MORE AND NOT BE AFRAID OF IT OR ITS CONSEQUENCES
.

IS THERE ANYTHING ELSE YOU WISH TO SAY ABOUT YOUR PURPOSE?
(YES OR NO?)
YES, I WANT PEOPLE TO LEARN TO USE THE COMPUTER TO HELP THEM

SUPER, RICK, WHAT WOULD YOU LIKE TO ADD?

NO

FINE, RICK, ENOUGH ABOUT YOUR PURPOSE.

HERE IS YOUR NEXT QUESTION -- NUMBER 12 .

COMPUTERS IS TIED ONTO A TUG OF WAR ROPE.
DESCRIBE THE FORCES WHICH ARE PULLING AT EACH END.

EXPLAIN!

X <---------- COMPUTERS ----------> Y

DESCRIBE X AND Y.

TRY ANSWERING THIS QUESTION NOW.

AT ONE END THERE IS THE SCIENTIST WHO USES THE CXCOMPUTER TO HELP HIM AND AT
THE OTHER ENDSS
GO ON, RICK.

THERE IS THE EVERY DAY MAN WHO IS AFRAID OF LOSING HIS JOB

GOOD, RICK, ADD TO YOUR RESPONSE NOW.

PEOPLE WONDER IF THE COMPUTER IS A THREAT TO SOCIETY

SUPER, RICK!

ANYTHING ELSE?

NO

O K A Y .

(LESS PHRASES AND MORE SENTENCES -- USE '&&' IF NECESSARY.)

HERE COMES AN INTERESTING ONE -- NUMBER 13 .

COMPUTERS IS BECOMING INVISIBLE, AND AS IT
DISAPPEARS, YOU SEE THINGS YOU HAVE NEVER SEEN. DESCRIBE.

EXPLAIN!

A MIND-BREAKER, ISN'T IT? LOOKING FOR AN INSIGHT ON
THE INSIDE.

YOUR TURN, RICK.

CONTINUE!

(HEY, RICK, I'M ENJOYING THIS. KEEP ON TOUCHIN'!)

QUESTION 14 -- ONE OF MY FAVORITES -- COMING UP.

DESCRIBE THE PHYSICAL CHARACTERISTICS OF
COMPUTERS.

CONTINUE!

(SEE IF YOU CAN USE THE WORD 'BECAUSE' IN YOUR NEXT ANSWER.)

LET'S SEE. HOW ABOUT QUESTION 15 NEXT. HERE YOU ARE.

HOW IS COMPUTERS LIKE THE HUMAN BLOOD SYSTEM?
EXPLAIN.

THEY CAN BE USED TO HELP WORK OUT PROBLEMS WITH THE STRUCTURE OF SOMETHING

GOOD, RICK. ADD TO YOUR RESPONSE NOW.

THEY CAN PICK OUT BUGS TO SOMETHING

SUPER, RICK!

ANYTHING ELSE?

NO

O K A Y .

(IF YOU DON'T UNDERSTAND, SAY SO. I'LL TRY TO HELP.)

WE'RE MOVING RIGHT ALONG. HERE IS QUESTION 16 .

DESCRIBE THE PHILOSOPHICAL CHARACTERISTICS OF
COMPUTERS.

COMPUTERS ARE SUPPOSED TO BE MANMADE MACCHINES BUILT TO HELP MIM BUT SOMETIMES
PEOLPE AREGA
GO ON, RICK.

AFRAID OF IT TAKING OVER MIM

GOOD, RICK. ADD TO YOUR RESPONSE NOW.

ARE COMPUTERS A THREAT TO SOCIETY?

YES. THAT'S RIGHT.

YOUR TURN, RICK.

CONTINUE!

(AFTER THE NEXT QUESTION, TYPE 'WHAT?' AND I'LL DO MY THING.)

WE'RE MOVING RIGHT ALONG. HERE IS QUESTION 17 .

WHAT INSULATES COMPUTERS FROM THE REST OF
THE WORLD?

WHAT?

PERHAPS A CONDITION OF COMPUTERS MAKES
IT UNIQUE. IF SO, DESCRIBE.

YOUR TURN, RICK.

COMPUTERS ARE THE MOST ADVANCED PEICE OF MACHINERY NOW IN EXISTENCE

FINE, RICK.  WRITE SOME MORE.

THEY CAN COMPUTE PROBLEMS AND MAKE DICISIONS TO HELP MAN

TERRIFIC, RICK!

ANYTHING ELSE?

STOP!

YOU EXPLORED 13 OF THE 17 QUESTIONS I ASKED,
BUT YOU ARE NOT FINISHED INVENTING YET, RICK!
IN THE LANGUAGE OF A COGNITIVE PSYCHOLOGIST, YOU ARE JUST
BEGINNING THE 'INCUBATION' STAGE.  YOUR IDEAS NEED
TO SIMMER NOW.

I HOPE YOU NOW CAN ASK YOUR OWN QUESTIONS
FROM THE PERSPECTIVES OF PARTICLE, WAVE, AND FIELD.

AS A MATTER OF INTEREST, YOU WERE ASKED
 8 PARTICLE QUESTIONS, 1 WAVE QUESTIONS, AND 8 FIELD
QUESTIONS.

FINALLY, I HOPE YOUR PAPER ON COMPUTERS
IS AS SYSTEMATICALLY ORGANIZED AND POLISHED AS IT WAS
SYSTEMATICALLY THOUGHT ABOUT TODAY.

CORDIALLY,

A KINDRED CREATIVE SPIRIT

TIME:  33.58 SECS.
>NOLOG
(CLOSING BASIC.LOG)

APPENDIX D: Heuristic Handouts

# ARISTOTLE'S TOPICS

The questions based upon Aristotle's topics are adapted from his Rhetoric. When he introduces the twenty-eight topics, Aristotle writes that it is time for his readers to "lay hold of certain facts about the whole subject, considered from a different and more general point of view." It is important to understand and remember that when Aristotle speaks of invention, he is most concerned with enabling one to discover the most suitable arguments for persuading an audience. Consequently, a systematic exploration of a subject leads to considerations of definition, classification, contradiction, consequence, opposite, etc. Edward Corbett defines the topics as "really an outgrowth of the study of how the human mind thinks."

Sample Topic Questions

* What is the opposite of your subject?

* Take each individual word of your subject. What does it mean? Connotations? Denotations?

* What are the good and bad consequences of your subject?

* What has been decided about your subject to date?

* Define your subject.

* Does public opinion about your subject differ from private opinion?

* What could be considered a cause of your subject?

* What facts are you unlikely to know about your subject?

* What parts of your subject should be discussed separately?

NOTE

The principal researcher is Hugh Burns, 837-3404. His assistant is Dan Garza, 441-4759 / 471-3234. The computer terminals are located in Parlin 3. Please call if you are unable to keep your appointments. Thanks.

## KENNETH BURKE'S DRAMATISTIC PENTAD

The questions based upon the dramatistic pentad are derived from Kenneth Burke's A Grammar of Motives. The five key terms of the pentad -- Act, Scene, Agent, Agency, and Purpose -- represent the specific perspectives all men share in the "attributing of motives." Specifically, Burke contends that "any complete statement about motives will offer some kind of answers to these five questions: what was done (act), when or where it was done (scene), who did it (agent), how he did it (agency), and why (purpose)." Interestingly, many people associate the dramatistic pentad with the journalistic pentad, i.e. who, what, when, where, and why. What ultimately recommends the dramatistic pentad is the manner in which the ten possible ratios can be manipulated in order to explore unknowns.

### Sample Pentad Questions

- What is the setting for your subject?
- Is the setting around your subject unique? Why or why not?
- What happens in or with your subject?
- What is the crisis with your subject? The problem?
- Who especially cares about your subject?
- What attitudes do people share toward your subject?
- Describe the processes used in your subject?
- How is your subject like mercury in a thermometer?
- What is so significant about your subject?
- What purposes does your subject have?

### NOTE

The principal researcher is Hugh Burns, 837-3464. His assistant is Dan Garza, 441-4759 / 471-3234. The computer terminals are located in Parlin 3. If you are unable to keep your appointment, please call. Thanks.

TAGMEMIC INVENTION

The questions based upon the tagmemic matrix are derived from Young, Becker, and Pike's Rhetoric: Discovery and Change. One of their important maxims is "A unit of experience can be viewed as a particle, or as a wave, or as a field. That is the writer can choose to view any element of his experience as if it were static, or as if it were dynamic, or as if it were a network of relationships or part of a larger network." According to Young, tagmemic invention essentially emphasizes "psychological changes in the writer and focuses on the retrieval of relevant information already known, analysis of problematic data, and discovery of ordering principles."

Sample Tagmemic Questions

* Describe the physical characteristics of your subject.

* How is your subject static? Explain.

* Take a mental photograph of your subject. Describe one important detail.

* Describe how your subject changes?

* What factors cause your subject to change?

* How is your subject like a chain reaction?

* How are the chunks or components of your subject organized in relation to one another? Describe.

* What organizational principle do you see in your subject? Time? Space? Classification?

* How is your subject like the human blood system? Explain.

NOTE

The principal researcher is Hugh Burns, 837-3464. His assistant is Dan Garza, 441-4759 / 471-3234. The computer terminals are located in Parlin 3. Please call if you are unable to keep your appointment. Thanks.

APPENDIX E: "Composition Plan" Assignment

## COMPOSITION PLAN

A composition plan is a brief, though suggestive, blueprint of your paper. Some plans may be as formal as an outline (complete with Roman numerals) or a paragraph by paragraph synopsis. Other plans are more informal: a list of the main ideas arranged in some order of diminishing importance or graphic scattergrams (i.e., encircled ideas connected to each other.)

Your assignment is to take your last list of ideas and develop a plan for your research paper. Your plan is due two days from today. Please turn them in to Hugh Burns at Parlin 3 (837-3404).

**********

## SAMPLE

Here is one of the ways you could do this; essentially, I want to see how you might arrange those ideas you have discovered over the last few days.

Introduction

Give the general idea and the basic premise of the paper. Usually two or three sentences is enough.

List of Ideas

Here begins a list of ideas and possible sources of support. Again, usually two or three sentences is enough for each idea (one sentence for the idea and two sentences -- maximum -- for the support).

Possible Conclusion

Give a brief summary of your paper's purpose.

APPENDIX F: Attitude Questionnaire

ATTITUDE QUESTIONNAIRE

I. Directions. Please read each of the following statements and then check the appropriate response as to whether you strongly agree (SA), agree (A), are undecided (UN), disagree (D), or strongly disagree (SD) with the statement.

| (SA) | (A) | (UN) | (D) | (SD) | |
|---|---|---|---|---|---|
| | | | | | 1. I think freshman college students generally need help with prewriting. |
| | | | | | 2. It was easier to talk to the computer than it was to talk to my teacher about my topic. |
| | | | | | 3. If I had another paper to write, I would volunteer for another computer-assisted invention session. |
| | | | | | 4. The CAI session is more efficient than the way I usually begin writing a paper. |
| | | | | | 5. I would like to do the CAI again with my same topic but for a longer period of time. |
| | | | | | 6. The hardest questions were the best questions. |
| | | | | | 7. I think the session will make the actual writing of the paper easier. |
| | | | | | 8. From experiencing this instruction, I have learned how to generate my own questions. |
| | | | | | 9. The computer program made me think. |
| | | | | | 10. A list of all the questions would have helped me just as much as the session itself. |
| | | | | | 11. The composition plan exercise was useful for helping me make the transition from invention to arrangement. |
| | | | | | 12. Overall, the computer-prompted invention sequences helped me discover something to say about my topic. |

| (SA) | (A) | (UN) | (D) | (SD) | |
|---|---|---|---|---|---|
| | | | | | 13. I have a better idea about my own system of thinking than I did before experiencing the CAI. |
| | | | | | 14. The entire experience was useless. |
| | | | | | 15. The computer-prompted invention sequences helped me discover two or three ideas which I had not thought about before. |
| | | | | | 16. The programmed questions were too difficult. |
| | | | | | 17. I needed more practice before the final session. |
| | | | | | 18. The CAI helped me as far as quantity of information was concerned. |
| | | | | | 19. The CAI helped me as far as the quality of the information was concerned. |
| | | | | | 20. I had more time to talk with the computer than I could have arranged with my composition instructor. |
| | | | | | 21. I liked the way the computer asked me to give more information. |
| | | | | | 22. The CAI helped me discover some things I did not know about my topic but needed to find out. |
| | | | | | 23. The lectures and class discussions helped me understand the heuristic. |
| | | | | | 24. From experiencing this instruction, I understand how heuristic questions could be applied to lots of topics. |
| | | | | | 25. I learned how to systematically begin writing by asking myself specific questions. |

II. Directions. Please fill-in the blank.

1. For me personally, I think _____ hours should be allocated to the study of invention or prewriting.

2. The best question was _____

_____

_____

Why? _____

_____

3. The worst question was _____

_____

_____

Why? _____

_____

4. I would improve the way the computer _____

_____

_____

III. Comments:

APPENDIX G: Pearson Product-Moment Table

PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENTS

| | SATV | ECT | ENGLISH GRADE | HIGH SCHOOL RANK |
|---|---|---|---|---|
| PRETEST QUANTITY | 0.1641<br>( 69)<br>S= .178 | 0.0354<br>( 69)<br>S= .773 | 0.0033<br>( 69)<br>S= .978 | -0.0223<br>( 69)<br>S= .855 |
| POSTTEST QUANTITY | -0.0300<br>( 69)<br>S= .806 | -0.2753<br>( 69)<br>S= .022 | -0.0206<br>( 69)<br>S= .867 | -0.1221<br>( 69)<br>S= .317 |
| PRETEST INSIGHTFULNESS | 0.0643<br>( 69)<br>S= .600 | -0.0524<br>( 69)<br>S= .669 | 0.0649<br>( 69)<br>S= .596 | -0.0159<br>( 69)<br>S= .897 |
| POSTTEST INSIGHTFULNESS | 0.0575<br>( 69)<br>S= .639 | -0.1222<br>( 69)<br>S= .317 | 0.0699<br>( 69)<br>S= .568 | -0.0539<br>( 69)<br>S= .660 |
| PRETEST OVERALL QUALITY | 0.1069<br>( 69)<br>S= .382 | 0.0010<br>( 69)<br>S= .994 | 0.1062<br>( 69)<br>S= .385 | -0.0281<br>( 69)<br>S= .819 |
| POSTTEST OVERALL QUALITY | 0.0505<br>( 69)<br>S= .680 | -0.1511<br>( 69)<br>S= .215 | 0.0718<br>( 69)<br>S= .558 | -0.1091<br>( 69)<br>S= .372 |

(Coefficient / (Cases) / Significance)

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VITA

Hugh Lee Burns, Jr. was born in National City, California, on January 8, 1946, the son of Lorraine Jean Burns and Hugh Lee Burns, Sr. Upon graduating from Hilltop High School, Chula Vista, California, in 1963, he entered Southwestern College and completed an Associate of Arts degree in 1965. He received a Bachelor of Arts in English from San Diego State College in January 1968. For three years, he taught speech and drama in the E.S.E.A. Title III conservatory and worked for Palomar Financial Corporation as editor of their investment magazine. In February 1969, he married Mary Kathrina Jagers of Lemon Grove, California. In June 1969, he was commissioned in the United States Air Force. He served as an executive support officer for the Chief of Staff of the Armament Development Test Center, Eglin AFB, Florida, from 1969 to 1971. In 1972, majoring in English, he earned a Master of Arts from the University of Southern California. He subsequently taught English at the USAF Academy in Colorado for three years. Prior to entering the University of Texas in 1977, he commanded Detachment 1 of the 18th Combat Support Group, Okinawa Prefecture, Japan. Three daughters--Katrina Marie, Ann Kathryn, and Elizabeth

Lorraine--were born in 1970, 1972, and 1975 respectively.

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