STIMULATING RHETORICAL INVENTION IN ENGLISH COMPOSITION THROUGH--ETC(U)

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STIMULATING RHETORICAL INVENTION IN ENGLISH COMPOSITION
THROUGH COMPUTER-ASSISTED INSTRUCTION

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To Mary
STIMULATING RHETORICAL INVENTION IN ENGLISH COMPOSITION
THROUGH COMPUTER-ASSISTED INSTRUCTION

by

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DISSERTATION
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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 \( P < .001 \) 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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"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 comprehensiveness, 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 how 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 faculties 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 which 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 topic, 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: quius, 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). Incidentally, 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 an 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 first developmental task was to design a set of instructional prewriting questions which examine three particular, related perspectives for examining a situation. However, had to be (at worst) interesting, appropriate, and

Koestler,
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 recurring 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-cued conditioned questions the students would answer when they logged in at the computer terminal.

During the week of the lectures, experimental subjects were scheduled for a practice session. These thirty-minute practice sessions were conducted in order to familiarize the students with the operation of the Lear Siegler ACM-1 display terminal, a CRT. Specifically, they were taught the keyboard characters, cursor control keys and special (e.g., RETURN, SHIFT, TAB) practice sessions also taught the invention program's commands and the conclusion of the given input program.
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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,
<table>
<thead>
<tr>
<th>Surface Representation</th>
<th>Propositional Analysis</th>
<th>Idea Count</th>
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<tbody>
<tr>
<td>John sleeps.</td>
<td>(SLEEP, JOHN)</td>
<td>2</td>
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<tr>
<td>Mary bakes a cake.</td>
<td>(BAKE, MARY, CAKE)</td>
<td>3</td>
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<tr>
<td>Freud</td>
<td>0</td>
<td>1</td>
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<tr>
<td>A robin is a bird.</td>
<td>(BIRD, ROBIN)</td>
<td>2</td>
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<tr>
<td>A bird has feathers.</td>
<td>(HAVE, BIRD, FEATHERS)</td>
<td>3</td>
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<tr>
<td>The man is sick.</td>
<td>(SICK, MAN)</td>
<td>2</td>
</tr>
<tr>
<td>If Mary trusts John, she is a fool.</td>
<td>(IF, (TRUST, MARY, JOHN), (FOOL, MARY))</td>
<td>2</td>
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<td>The old man smiled and left the room.</td>
<td>(OLD, MAN) &amp; (SMILE, MAN) &amp; (LEAVE, MAN, ROOM)</td>
<td>3</td>
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<tr>
<td>Mary claimed that the old man smiled and left the room.</td>
<td>(CLAIM, MARY, @) &amp; ((OLD, MAN) &amp; (SMILE, MAN) &amp; (LEAVE, MAN, ROOM) @)</td>
<td>3</td>
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<td>The snow melts slowly.</td>
<td>(MELT, SNOW) &amp; (SLOW, MELT)</td>
<td>3</td>
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**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 an 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

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<thead>
<tr>
<th></th>
<th>Means</th>
<th>Std. Dev.</th>
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<tr>
<td>I</td>
<td>77.42754</td>
<td>66.17097</td>
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<tr>
<td>II</td>
<td>58.36957</td>
<td>45.90105</td>
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<td>III</td>
<td>67.24638</td>
<td>55.82700</td>
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Correlation Matrix

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<th>I</th>
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<td>1.00000</td>
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<tr>
<td>II</td>
<td>0.98171</td>
<td>1.00000</td>
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<tr>
<td>III</td>
<td>0.98393</td>
<td>0.98610</td>
<td>1.00000</td>
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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 expectancies—the average reader interested in such a topic would presumably want certain implicit questions about a topic satisfactorily answered. These expectancies 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

<table>
<thead>
<tr>
<th>RELIABILITY Coefficients</th>
<th>3 Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Factuality, Surprise Value, Insightfulness&quot;</td>
<td>Alpha = 0.83072 Standardized Item Alpha = 0.84099</td>
</tr>
<tr>
<td>&quot;Comprehensiveness&quot;</td>
<td>Alpha = 0.75418 Standardized Item Alpha = 0.76489</td>
</tr>
<tr>
<td>&quot;Intellectual Processing&quot;</td>
<td>Alpha = 0.79591 Standardized Item Alpha = 0.80076</td>
</tr>
<tr>
<td>&quot;Overall Impression&quot;</td>
<td>Alpha = 0.81481 Standardized Item Alpha = 0.82538</td>
</tr>
</tbody>
</table>

# of cases = 138.0

Table 2.3
ALPHA RELIABILITIES FOR COMPOSITION PLAN QUALITATIVE EVALUATION

<table>
<thead>
<tr>
<th>RELIABILITY Coefficients</th>
<th>3 Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Insightfulness&quot;</td>
<td>Alpha = 0.78117 Standardized Item Alpha = 0.78238</td>
</tr>
<tr>
<td>&quot;Comprehensiveness&quot;</td>
<td>Alpha = 0.70305 Standardized Item Alpha = 0.70434</td>
</tr>
<tr>
<td>&quot;Maturity&quot;</td>
<td>Alpha = 0.68106 Standardized Item Alpha = 0.68173</td>
</tr>
<tr>
<td>&quot;Arrangement&quot;</td>
<td>Alpha = 0.79076 Standardized Item Alpha = 0.79067</td>
</tr>
<tr>
<td>&quot;Helpfulness&quot;</td>
<td>Alpha = 0.71547 Standardized Item Alpha = 0.73240</td>
</tr>
<tr>
<td>&quot;Overall Impression&quot;</td>
<td>Alpha = 0.74093 Standardized Item Alpha = 0.74936</td>
</tr>
</tbody>
</table>

# 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

<table>
<thead>
<tr>
<th>Correlation Matrix</th>
<th>Heuristic</th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heuristic</td>
<td>1.00000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>0.87727</td>
<td>1.00000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>0.95266</td>
<td>0.70360</td>
<td>1.00000</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>0.82213</td>
<td>0.51172</td>
<td>0.82335</td>
<td>1.00000</td>
</tr>
</tbody>
</table>

RELIABILITY Coefficients

<table>
<thead>
<tr>
<th></th>
<th>4 Items</th>
<th>3 Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha</td>
<td>0.89733</td>
<td>0.82891</td>
</tr>
<tr>
<td>Standardized Item Alpha</td>
<td>0.89551</td>
<td>0.82608</td>
</tr>
</tbody>
</table>

# 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

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean</th>
<th>Percentage</th>
<th>Positive/ Negative Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.33</td>
<td>43.7 50 4.2 0 2.1</td>
<td>P</td>
</tr>
<tr>
<td>2</td>
<td>3.10</td>
<td>16.7 20.8 27.1 27.1 8.7</td>
<td>P</td>
</tr>
<tr>
<td>3</td>
<td>3.92</td>
<td>31.2 37.5 25 4.2 2.1</td>
<td>P</td>
</tr>
<tr>
<td>4</td>
<td>3.64</td>
<td>20.8 39.6 25 4.2 2.1</td>
<td>P</td>
</tr>
<tr>
<td>5</td>
<td>4.10</td>
<td>45.8 31.2 14.6 4.2 4.2</td>
<td>P</td>
</tr>
<tr>
<td>6</td>
<td>3.80</td>
<td>16.7 45.3 20.8 14.6 2.1</td>
<td>P</td>
</tr>
<tr>
<td>7</td>
<td>3.84</td>
<td>14.6 47.9 27.1 8.3 2.1</td>
<td>P</td>
</tr>
<tr>
<td>8</td>
<td>3.79</td>
<td>10.4 68.8 10.4 10.4 0</td>
<td>P</td>
</tr>
<tr>
<td>9</td>
<td>4.35</td>
<td>39.6 56.2 4.2 0 0</td>
<td>P</td>
</tr>
<tr>
<td>10</td>
<td>2.97</td>
<td>14.6 20.8 20.8 35.4 8.3</td>
<td>N</td>
</tr>
<tr>
<td>11</td>
<td>3.48</td>
<td>8.3 39.6 45.8 4.2 2.1</td>
<td>P</td>
</tr>
<tr>
<td>12</td>
<td>3.71</td>
<td>14.6 56.2 14.6 14.6 0</td>
<td>P</td>
</tr>
<tr>
<td>13</td>
<td>2.04</td>
<td>6.2 27.1 35.4 27.1 4.2</td>
<td>P</td>
</tr>
<tr>
<td>14</td>
<td>4.42</td>
<td>0 0 6.2 45.8 47.9</td>
<td>N</td>
</tr>
<tr>
<td>15</td>
<td>3.81</td>
<td>14.6 64.6 10.4 8.3 2.1</td>
<td>P</td>
</tr>
<tr>
<td>16</td>
<td>3.98</td>
<td>0 2.1 18.7 64.6 18.7</td>
<td>N</td>
</tr>
<tr>
<td>17</td>
<td>3.60</td>
<td>6.2 16.7 6.2 52.1 18.3</td>
<td>N</td>
</tr>
<tr>
<td>18</td>
<td>2.98</td>
<td>0 33.3 32.3 31.2 2.1</td>
<td>P</td>
</tr>
<tr>
<td>19</td>
<td>3.69</td>
<td>10.4 56.2 25 9.3 0</td>
<td>P</td>
</tr>
<tr>
<td>20</td>
<td>2.58</td>
<td>8.7 14.6 22.9 35.4 18.8</td>
<td>P</td>
</tr>
<tr>
<td>21</td>
<td>3.25</td>
<td>8.3 47.9 14.6 18.8 10.4</td>
<td>P</td>
</tr>
<tr>
<td>22</td>
<td>3.77</td>
<td>16.7 56.2 16.7 8.3 2.1</td>
<td>P</td>
</tr>
<tr>
<td>23</td>
<td>3.02</td>
<td>4.2 70.8 12.5 8.3 4.2</td>
<td>P</td>
</tr>
<tr>
<td>24</td>
<td>4.30</td>
<td>16.7 72.9 6.2 2.1 2.1</td>
<td>P</td>
</tr>
<tr>
<td>25</td>
<td>3.68</td>
<td>6.2 62.5 22.9 9.3 0</td>
<td>P</td>
</tr>
</tbody>
</table>

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 1560 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 seemed 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 \( (F=1.072, \ p=.350; \text{ see Table 3.2}) \); however, a statistically significant difference among the groups on their elaboration performance was discovered \( (F=3.927, \ p=.026; \text{ see Table 3.3}) \). Additionally, an analysis of covariance by group with
Table 3.2
ANALYSIS OF VARIANCE FOR HEURISTIC ANSWERING RATE AMONG THREE EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>375.86</td>
<td>2</td>
<td>187.593</td>
<td>1.072</td>
<td>0.350</td>
</tr>
<tr>
<td>Explained</td>
<td>375.186</td>
<td>2</td>
<td>187.593</td>
<td>1.072</td>
<td>0.350</td>
</tr>
<tr>
<td>Residual</td>
<td>8750.625</td>
<td>50</td>
<td>175.013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>9125.811</td>
<td>52</td>
<td>175.496</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

53 cases were processed.

Table 3.3
ANALYSIS OF VARIANCE FOR HEURISTIC ELABORATION RATE AMONG THREE EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>3912.391</td>
<td>2</td>
<td>1956.196</td>
<td>3.927</td>
<td>0.026</td>
</tr>
<tr>
<td>Explained</td>
<td>3912.391</td>
<td>2</td>
<td>1956.196</td>
<td>3.927</td>
<td>0.026</td>
</tr>
<tr>
<td>Residual</td>
<td>24908.477</td>
<td>50</td>
<td>498.170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28820.868</td>
<td>52</td>
<td>554.247</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 35.5769 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

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT Verbal</td>
<td>352.668</td>
<td>1</td>
<td>352.668</td>
<td>0.691</td>
<td>0.410</td>
</tr>
<tr>
<td>Main effects</td>
<td>3606.445</td>
<td>2</td>
<td>1803.222</td>
<td>3.535</td>
<td>0.037</td>
</tr>
<tr>
<td>Group</td>
<td>3606.445</td>
<td>2</td>
<td>1803.223</td>
<td>3.535</td>
<td>0.037</td>
</tr>
<tr>
<td>Explained</td>
<td>3959</td>
<td>3</td>
<td>1319.704</td>
<td>2.587</td>
<td>0.084</td>
</tr>
<tr>
<td>Residual</td>
<td>23975.868</td>
<td>47</td>
<td>510.125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>27934.980</td>
<td>50</td>
<td>558.700</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Covariate Raw regression coefficient

SATV .0.036

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

Table 3.5
MULTIPLE CLASSIFICATION ANALYSIS FOR HEURISTIC ELABORATION RATE AMONG THREE EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th>Variable - category</th>
<th>N</th>
<th>Unadjusted Dev'n Eta</th>
<th>Adjusted for independents Dev'n Eta</th>
<th>Adjusted for independents - covariates Dev'n Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>19</td>
<td>9.93</td>
<td>9.01</td>
<td></td>
</tr>
<tr>
<td>Burke</td>
<td>17</td>
<td>-10.78</td>
<td>-10.93</td>
<td></td>
</tr>
<tr>
<td>Tagmemic</td>
<td>15</td>
<td>-0.35</td>
<td>0.37</td>
<td>0.38</td>
</tr>
</tbody>
</table>

Multiple R squared .142
Multiple R .178
Table 3.6  
RESULTS OF TWO-TAILED T-TEST FOR CORRELATED SAMPLES ON QUANTITY OF IDEAS WITHIN ARISTOTLE GROUP

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>NUMBER OF CASES</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
<th>(DIFFERENCE) MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protest</td>
<td>19</td>
<td>35.5789</td>
<td>12.959</td>
<td>2.973</td>
<td>-90.3684</td>
<td>47.321</td>
<td>10.856</td>
</tr>
<tr>
<td>Posttest</td>
<td>19</td>
<td>125.9474</td>
<td>46.741</td>
<td>10.723</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-54.7895</td>
<td>31.280</td>
<td>11.764</td>
</tr>
<tr>
<td>Protest</td>
<td>19</td>
<td>71.1570</td>
<td>25.917</td>
<td>5.046</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posttest</td>
<td>19</td>
<td>125.9474</td>
<td>46.741</td>
<td>10.723</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2-TAIL PROB. | T VALUE | DEGREES OF FREEDOM | 2-TAIL PROB. |
-------------|---------|--------------------|--------------|
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

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>NUMBER OF CASES</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
<th>(DIFFERENCE) MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>17</td>
<td>30.7647</td>
<td>19.842</td>
<td>4.812</td>
<td>-102.4118</td>
<td>57.724</td>
<td>14.000</td>
</tr>
<tr>
<td>Posttest</td>
<td></td>
<td>133.1765</td>
<td>54.985</td>
<td>13.336</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posttest</td>
<td></td>
<td>133.1765</td>
<td>54.985</td>
<td>13.336</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CORR. 2-TAIL. PROB.</th>
<th>T VALUE</th>
<th>DEGREES OF FREEDOM</th>
<th>2-TAIL PROB.</th>
</tr>
</thead>
<tbody>
<tr>
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(continued)
<table>
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<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
<th>(DIFFERENCE) MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
</tr>
</thead>
<tbody>
<tr>
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<td>27.2353</td>
<td>14.977</td>
<td>3.633</td>
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<td>15.369</td>
</tr>
<tr>
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<td></td>
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<td>-53.1785</td>
<td>73.211</td>
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<tr>
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</tbody>
</table>

<table>
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<tr>
<th>CORR.</th>
<th>2-TAIL. PROB.</th>
<th>T VALUE</th>
<th>DEGREES OF FREEDOM</th>
<th>2-TAIL. PROB.</th>
</tr>
</thead>
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<td>0.110</td>
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<td>0.000</td>
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<tr>
<td>-0.401</td>
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### Table J.9

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

<table>
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<tr>
<th>VARIABLE</th>
<th>NUMBER OF CASES</th>
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<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
<th>(DIFFERENCE) MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posttest</td>
<td></td>
<td>45.0000</td>
<td>17.154</td>
<td>4.289</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posttest</td>
<td></td>
<td>45.0000</td>
<td>17.154</td>
<td>4.289</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>CORR. 2-TAIL</th>
<th>2-TAIL</th>
<th>DEGREES OF FREEDOM</th>
<th>2-TAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.504</td>
<td>0.047</td>
<td>-4.10</td>
<td>15</td>
</tr>
</tbody>
</table>

*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>
<thead>
<tr>
<th>GROUP</th>
<th>VARIABLE</th>
<th>NUMBER OF CASES</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
<th>(DIFFERENCE)</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>19</td>
<td>5.5263</td>
<td>2.195</td>
<td>0.504</td>
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<td>0.593</td>
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<td>Aristotle</td>
<td>Posttest</td>
<td>10.2105</td>
<td>2.299</td>
<td>0.527</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.6471</td>
<td>1.766</td>
<td>0.428</td>
<td>-4.4118</td>
<td>2.830</td>
<td>0.686</td>
</tr>
<tr>
<td>Burke</td>
<td></td>
<td>17</td>
<td>9.0588</td>
<td>2.277</td>
<td>0.553</td>
<td>-4.6471</td>
<td>3.408</td>
<td>0.827</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td></td>
<td>4.4118</td>
<td>1.583</td>
<td>0.384</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tagmemic</td>
<td>Pretest</td>
<td>17</td>
<td>9.0588</td>
<td>2.384</td>
<td>0.578</td>
<td>-1.3750</td>
<td>1.893</td>
<td>0.473</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td></td>
<td>4.5825</td>
<td>1.879</td>
<td>0.470</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>16</td>
<td>5.9375</td>
<td>1.879</td>
<td>0.470</td>
<td>-4.6471</td>
<td>3.408</td>
<td>0.827</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GROUP</th>
<th>CORR.</th>
<th>2-WAY PROB.</th>
<th>T VALUE</th>
<th>DEGREES OF FREEDOM</th>
<th>2-TAIL PROB.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aristotle</td>
<td>0.346</td>
<td>0.154</td>
<td>-7.90</td>
<td>18</td>
<td>0.000</td>
</tr>
<tr>
<td>Burke</td>
<td>0.037</td>
<td>0.889</td>
<td>-0.43</td>
<td>16</td>
<td>0.000</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>-0.454</td>
<td>0.067</td>
<td>-5.62</td>
<td>16</td>
<td>0.000</td>
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<tr>
<td>Control</td>
<td>0.436</td>
<td>0.091</td>
<td>-2.91</td>
<td>15</td>
<td>0.011</td>
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</table>

Table (cont.)
Table 3.11

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

<table>
<thead>
<tr>
<th>GROUP</th>
<th>VARIABLE</th>
<th>NUMBER OF CASES</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
<th>(DIFFERENCE)</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Protest</td>
<td>19</td>
<td>6.0520</td>
<td>2.147</td>
<td>0.492</td>
<td>-3.8947</td>
<td>3.398</td>
<td>0.779</td>
</tr>
<tr>
<td>Aristotle</td>
<td>Posttest</td>
<td>19</td>
<td>9.9474</td>
<td>2.697</td>
<td>0.619</td>
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<td>3.220</td>
<td>0.781</td>
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<td>3.693</td>
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<td>0.881</td>
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<td>Posttest</td>
<td>17</td>
<td>8.4118</td>
<td>2.599</td>
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<td>-0.9375</td>
<td>2.645</td>
<td>0.661</td>
</tr>
<tr>
<td></td>
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<td>5.3750</td>
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<td>0.554</td>
<td>-0.9375</td>
<td>2.645</td>
<td>0.661</td>
</tr>
<tr>
<td>Control</td>
<td>Posttest</td>
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<td>6.3125</td>
<td>2.549</td>
<td>0.637</td>
<td>-0.9375</td>
<td>2.645</td>
<td>0.661</td>
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<th>GROUP</th>
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<th>2-TAIL T-VALUE</th>
<th>DEGREES OF FREEDOM</th>
<th>2-TAIL T-VALUE</th>
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<tr>
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<tr>
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<td>0.391</td>
<td>0.135</td>
<td>-1.42</td>
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Table 3.12
RESULTS OF TWO-TAILED T-TEST FOR CORRELATED SAMPLES ON EVIDENCE
OF INTELLECTUAL PROCESSING WITHIN EACH GROUP

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<th>GROUP</th>
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<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>1.770</td>
<td>0.429</td>
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<td>0.509</td>
</tr>
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<td>Burke</td>
<td>16</td>
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<td>-1.0625</td>
<td>2.016</td>
<td>0.504</td>
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<td>Posttest</td>
<td>Burke</td>
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<td>2.443</td>
<td>0.593</td>
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<td></td>
<td>Pretest</td>
<td>Tagmemic</td>
<td>17</td>
<td>5.4118</td>
<td>1.770</td>
<td>-3.4706</td>
<td>3.448</td>
<td>0.836</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td>Tagmemic</td>
<td></td>
<td>9.1176</td>
<td>2.118</td>
<td>-5.4706</td>
<td>3.448</td>
<td>0.836</td>
</tr>
<tr>
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<td>Pretest</td>
<td>Control</td>
<td>17</td>
<td>4.4706</td>
<td>1.663</td>
<td>-5.4706</td>
<td>3.448</td>
<td>0.836</td>
</tr>
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<td>Control</td>
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<td>3.448</td>
<td>0.836</td>
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<th>DEGREES OF FREEDOM</th>
<th>2-TAIL PROB.</th>
</tr>
</thead>
<tbody>
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<tr>
<td>(cont.) Burke...</td>
<td>0.220 0.397</td>
<td>-6.25 16</td>
<td>0.000</td>
</tr>
<tr>
<td>(cont.) Tagmemic...</td>
<td>-0.375 0.139</td>
<td>-6.54 16</td>
<td>0.000</td>
</tr>
<tr>
<td>(cont.) Control...</td>
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<td>0.052</td>
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<td>VARIABLE</td>
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<td>MEAN</td>
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<td>----------</td>
<td>-----------------</td>
<td>------</td>
</tr>
<tr>
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<td>Pretest</td>
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</tr>
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<td>Posttest</td>
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<td>10.1053</td>
</tr>
<tr>
<td>Burke</td>
<td>Pretest</td>
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<td>4.7059</td>
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<td></td>
<td>Posttest</td>
<td></td>
<td>8.4706</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>Pretest</td>
<td>17</td>
<td>4.3529</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
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<td>9.0588</td>
</tr>
<tr>
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<td>Pretest</td>
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<td>4.7500</td>
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<td>Posttest</td>
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<td>6.0000</td>
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</table>

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<th>2-WAY T-TEST</th>
<th>DEGREES OF FREEDOM</th>
<th>2-TAIL PROB.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aristotle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burke</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tagmemic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (cont.)
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**

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F of F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
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<tr>
<td>SATV</td>
<td>2.391</td>
<td>2</td>
<td>1.195</td>
<td>1.569</td>
<td>0.221</td>
</tr>
<tr>
<td>ECT</td>
<td>2.388</td>
<td>1</td>
<td>2.388</td>
<td>3.136</td>
<td>0.085</td>
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<tr>
<td><strong>Main effects</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>2.715</td>
<td>2</td>
<td>1.358</td>
<td>1.783</td>
<td>0.182</td>
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<td>Explained</td>
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<td>4</td>
<td>1.276</td>
<td>1.876</td>
<td>0.178</td>
</tr>
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<td><strong>Residual</strong></td>
<td>28.941</td>
<td>38</td>
<td>0.762</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total:** 34.047 \( \text{df} = 42 \) \( \text{Mean Square} = 0.811 \)

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

### Table 3.15
**MULTIPLE CLASSIFICATION ANALYSIS FOR HEURISTIC INTERNALIZATION AMONG THREE EXPERIMENTAL GROUPS**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Variable + category</th>
<th>N</th>
<th>Dev’n Eta</th>
<th>Dev’n Beta</th>
<th>Adjusted for independents</th>
<th>Adjusted for independents + covariates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td></td>
<td>16</td>
<td>0.32</td>
<td>0.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burke</td>
<td></td>
<td>15</td>
<td>-0.04</td>
<td>-0.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tagmemic</td>
<td></td>
<td>12</td>
<td>-0.37</td>
<td>-0.36</td>
<td>0.31</td>
<td>0.29</td>
</tr>
</tbody>
</table>

**Multiple R squared**

<table>
<thead>
<tr>
<th>Multiple R squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.150</td>
</tr>
<tr>
<td>Multiple R</td>
</tr>
<tr>
<td>0.387</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SATV</td>
<td>1549.010</td>
<td>2</td>
<td>774.505</td>
<td>3.563</td>
<td>0.034</td>
</tr>
<tr>
<td>ECT</td>
<td>430.028</td>
<td>1</td>
<td>430.028</td>
<td>1.990</td>
<td>0.184</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>880.988</td>
<td>3</td>
<td>226.966</td>
<td>1.050</td>
<td>0.378</td>
</tr>
<tr>
<td>Explained</td>
<td>2229.908</td>
<td>3</td>
<td>445.982</td>
<td>2.063</td>
<td>0.084</td>
</tr>
<tr>
<td>Residual</td>
<td>11887.83</td>
<td>35</td>
<td>345.983</td>
<td>1.743</td>
<td>0.148</td>
</tr>
<tr>
<td>Total</td>
<td>14117.771</td>
<td>60</td>
<td>235.296</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

### Table 3.17
MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST QUANTITY OF IDEAS

<table>
<thead>
<tr>
<th>Variable + category</th>
<th>N</th>
<th>Unadjusted Dev'n Eta</th>
<th>Adjusted for Independents Dev'n Eta</th>
<th>Adjusted for Independents + covarlates Dev'n Beta</th>
<th>Adjusted for Independents + covarlates Dev'n Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>18</td>
<td>3.38</td>
<td>4.97</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burke</td>
<td>15</td>
<td>-2.28</td>
<td>-0.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tagmemic</td>
<td>14</td>
<td>-3.27</td>
<td>-1.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>14</td>
<td>-1.20</td>
<td>-3.92</td>
<td>0.23</td>
<td></td>
</tr>
<tr>
<td>Multiple R squared</td>
<td></td>
<td></td>
<td>.138</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple R</td>
<td></td>
<td></td>
<td>.397</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 3.18
**ANALYSIS OF COVARIANCE FOR POSTTEST QUANTITY OF IDEAS**

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SATV</td>
<td>3345.395</td>
<td>2</td>
<td>1672.698</td>
<td>0.952</td>
<td>0.392</td>
</tr>
<tr>
<td>ECT</td>
<td>344.314</td>
<td>1</td>
<td>334.314</td>
<td>0.190</td>
<td>0.664</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>65013.023</td>
<td>3</td>
<td>21671.008</td>
<td>12.334</td>
<td>0.000</td>
</tr>
<tr>
<td>Explained</td>
<td>68358.419</td>
<td>5</td>
<td>13671.684</td>
<td>7.781</td>
<td>0.000</td>
</tr>
<tr>
<td>Residual</td>
<td>96629.024</td>
<td>55</td>
<td>1757.073</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>164997.443</td>
<td>60</td>
<td>2749.957</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

### Table 3.19
**MULTIPLE CLASSIFICATION ANALYSIS FOR POSTTEST QUANTITY OF IDEAS**

<table>
<thead>
<tr>
<th>Variable - category</th>
<th>N</th>
<th>Unadjusted Dev's Eta</th>
<th>Adjusted for Independents Dev's Eta</th>
<th>Adjusted for Independents + Covariates Dev's Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>18</td>
<td>21.55</td>
<td>21.68</td>
<td>0.63</td>
</tr>
<tr>
<td>Burke</td>
<td>13</td>
<td>26.39</td>
<td>27.63</td>
<td>0.63</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>14</td>
<td>0.90</td>
<td>2.38</td>
<td>0.82</td>
</tr>
<tr>
<td>Control</td>
<td>14</td>
<td>-56.89</td>
<td>-59.68</td>
<td>0.63</td>
</tr>
</tbody>
</table>

Multiple R squared 414
Multiple R 444
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=.855; $p=.453$; 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**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates SATV</td>
<td>1212.504</td>
<td>1</td>
<td>1212.504</td>
<td>4.890</td>
<td>0.022</td>
</tr>
<tr>
<td>SATV</td>
<td>1212.504</td>
<td>1</td>
<td>1212.504</td>
<td>4.890</td>
<td>0.032</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>498.770</td>
<td>2</td>
<td>249.385</td>
<td>1.006</td>
<td>0.373</td>
</tr>
<tr>
<td>Explained</td>
<td>1711.274</td>
<td>3</td>
<td>570.425</td>
<td>2.301</td>
<td>0.089</td>
</tr>
<tr>
<td>Residual</td>
<td>11852.766</td>
<td>47</td>
<td>247.931</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>13364.039</td>
<td>50</td>
<td>267.281</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Covariate Raw regression coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATV 0.087</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Grand mean = 31.20</th>
<th>Adjusted for independents</th>
<th>Adjusted for covariates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable - category</td>
<td>N</td>
<td>Unadjusted Dev &amp; Eta Dev &amp; Beta</td>
</tr>
<tr>
<td>Groups</td>
<td>19</td>
<td>4.38</td>
</tr>
<tr>
<td>Aristotle</td>
<td>17</td>
<td>-0.43</td>
</tr>
<tr>
<td>Tagmantic</td>
<td>15</td>
<td>3.24</td>
</tr>
</tbody>
</table>

| Multiple R squared | .128 |
| Multiple R         | .358 |
Table 3.22
ANALYSIS OF COVARIANCE FOR POSTTEST QUANTITY OF IDEAS AMONG THREE EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>123.45</td>
<td>1</td>
<td>123.45</td>
<td>1.00</td>
<td>0.05</td>
</tr>
<tr>
<td>SATV</td>
<td>57.709</td>
<td>1</td>
<td>57.709</td>
<td>0.02</td>
<td>0.889</td>
</tr>
</tbody>
</table>

Main effects

<table>
<thead>
<tr>
<th>Groups</th>
<th>Covariates</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATV</td>
<td>57.709</td>
<td>1</td>
<td>57.709</td>
<td>0.02</td>
<td>0.889</td>
<td></td>
</tr>
</tbody>
</table>

Explained

<table>
<thead>
<tr>
<th>Groups</th>
<th>Covariates</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATV</td>
<td>57.709</td>
<td>1</td>
<td>57.709</td>
<td>0.02</td>
<td>0.889</td>
<td></td>
</tr>
</tbody>
</table>

Residual

<table>
<thead>
<tr>
<th>Groups</th>
<th>Covariates</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATV</td>
<td>57.709</td>
<td>1</td>
<td>57.709</td>
<td>0.02</td>
<td>0.889</td>
<td></td>
</tr>
</tbody>
</table>

Signif. of F

<table>
<thead>
<tr>
<th>Groups</th>
<th>Covariates</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATV</td>
<td>57.709</td>
<td>1</td>
<td>57.709</td>
<td>0.02</td>
<td>0.889</td>
<td></td>
</tr>
</tbody>
</table>

Total

<table>
<thead>
<tr>
<th>Groups</th>
<th>Covariates</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATV</td>
<td>57.709</td>
<td>1</td>
<td>57.709</td>
<td>0.02</td>
<td>0.889</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Variable - category</th>
<th>Groups</th>
<th>N</th>
<th>Dev'n Eta</th>
<th>Dev'n Beta</th>
<th>Multiple R squared</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aristotle</td>
<td>19</td>
<td>2.50</td>
<td>2.37</td>
<td>.034</td>
</tr>
<tr>
<td></td>
<td>Burke</td>
<td>17</td>
<td>9.73</td>
<td>9.79</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tagmemic</td>
<td>15</td>
<td>-14.18</td>
<td>-14.10</td>
<td></td>
</tr>
</tbody>
</table>

Adjusted for independents + covariates

<table>
<thead>
<tr>
<th>Variable - category</th>
<th>Groups</th>
<th>N</th>
<th>Dev'n Eta</th>
<th>Dev'n Beta</th>
<th>Multiple R squared</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aristotle</td>
<td>19</td>
<td>2.50</td>
<td>2.37</td>
<td>.034</td>
</tr>
<tr>
<td></td>
<td>Burke</td>
<td>17</td>
<td>9.73</td>
<td>9.79</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tagmemic</td>
<td>15</td>
<td>-14.18</td>
<td>-14.10</td>
<td></td>
</tr>
</tbody>
</table>

Adjusted for independents

<table>
<thead>
<tr>
<th>Variable - category</th>
<th>Groups</th>
<th>N</th>
<th>Dev'n Eta</th>
<th>Dev'n Beta</th>
<th>Multiple R squared</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aristotle</td>
<td>19</td>
<td>2.50</td>
<td>2.37</td>
<td>.034</td>
</tr>
<tr>
<td></td>
<td>Burke</td>
<td>17</td>
<td>9.73</td>
<td>9.79</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tagmemic</td>
<td>15</td>
<td>-14.18</td>
<td>-14.10</td>
<td></td>
</tr>
</tbody>
</table>

Multiple R squared

<table>
<thead>
<tr>
<th>Variable - category</th>
<th>Groups</th>
<th>N</th>
<th>Dev'n Eta</th>
<th>Dev'n Beta</th>
<th>Multiple R squared</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aristotle</td>
<td>19</td>
<td>2.50</td>
<td>2.37</td>
<td>.034</td>
</tr>
<tr>
<td></td>
<td>Burke</td>
<td>17</td>
<td>9.73</td>
<td>9.79</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tagmemic</td>
<td>15</td>
<td>-14.18</td>
<td>-14.10</td>
<td></td>
</tr>
</tbody>
</table>

Multiple R

<table>
<thead>
<tr>
<th>Variable - category</th>
<th>Groups</th>
<th>N</th>
<th>Dev'n Eta</th>
<th>Dev'n Beta</th>
<th>Multiple R squared</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aristotle</td>
<td>19</td>
<td>2.50</td>
<td>2.37</td>
<td>.034</td>
</tr>
<tr>
<td></td>
<td>Burke</td>
<td>17</td>
<td>9.73</td>
<td>9.79</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tagmemic</td>
<td>15</td>
<td>-14.18</td>
<td>-14.10</td>
<td></td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SATV</td>
<td>0.960</td>
<td>1</td>
<td>0.960</td>
<td>0.296</td>
<td>0.589</td>
</tr>
<tr>
<td>ECT</td>
<td>3.191</td>
<td>1</td>
<td>3.191</td>
<td>0.985</td>
<td>0.325</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>14.740</td>
<td>3</td>
<td>4.913</td>
<td>1.516</td>
<td>0.220</td>
</tr>
<tr>
<td>Explained</td>
<td>26.483</td>
<td>5</td>
<td>5.297</td>
<td>1.635</td>
<td>0.186</td>
</tr>
<tr>
<td>Residual</td>
<td>178.206</td>
<td>55</td>
<td>3.240</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>204.689</td>
<td>60</td>
<td>3.411</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

69 cases were processed
8 cases (11.8%) were missing.

Table 3.25
MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST FACTUALITY, SURPRISE VALUE, AND INSIGHTFULNESS OF IDEAS

<table>
<thead>
<tr>
<th>Grand mean = 4.70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable - category</td>
</tr>
<tr>
<td>Groups</td>
</tr>
<tr>
<td>Aristotle</td>
</tr>
<tr>
<td>Burke</td>
</tr>
<tr>
<td>Tagmemic</td>
</tr>
<tr>
<td>Control</td>
</tr>
</tbody>
</table>

Multiple R squared
Multiple R
0.129
0.380
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

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>5.239</td>
<td>2</td>
<td>2.620</td>
<td>0.567</td>
<td>0.570</td>
</tr>
<tr>
<td>SATV</td>
<td>0.331</td>
<td>1</td>
<td>0.331</td>
<td>0.072</td>
<td>0.790</td>
</tr>
<tr>
<td>ECT</td>
<td>1.394</td>
<td>1</td>
<td>1.394</td>
<td>0.345</td>
<td>0.559</td>
</tr>
<tr>
<td>Main effects Groups</td>
<td>182.083</td>
<td>3</td>
<td>60.694</td>
<td>13.148</td>
<td>0.000</td>
</tr>
<tr>
<td>Explained</td>
<td>187.322</td>
<td>5</td>
<td>37.464</td>
<td>8.116</td>
<td>0.000</td>
</tr>
<tr>
<td>Residual</td>
<td>253.891</td>
<td>55</td>
<td>4.616</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>441.213</td>
<td>60</td>
<td>7.354</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Variable + category</th>
<th>N</th>
<th>Unadjusted Dev’n Eta</th>
<th>Adjusted for independents Dev’n Eta</th>
<th>Adjusted for covariates Dev’n Eta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>18</td>
<td>1.69</td>
<td>1.63</td>
<td>1.63</td>
</tr>
<tr>
<td>Burke</td>
<td>15</td>
<td>0.26</td>
<td>0.47</td>
<td>0.47</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>14</td>
<td>0.21</td>
<td>0.34</td>
<td>0.34</td>
</tr>
<tr>
<td>Control</td>
<td>14</td>
<td>-2.76</td>
<td>-3.13</td>
<td>-3.13</td>
</tr>
</tbody>
</table>

Multiple R squared

- Multiple R squared: .423
- Multiple R: .352
### Table 3.28

**Analysis of Covariance for Pretest Factuality, Surprise Value, and Insightfulness Among Three Experimental Groups**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>19.495</td>
<td>1</td>
<td>19.495</td>
<td>6.171</td>
<td>0.017</td>
</tr>
<tr>
<td>SATV</td>
<td>19.495</td>
<td>1</td>
<td>19.495</td>
<td>6.171</td>
<td>0.017</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>10.784</td>
<td>2</td>
<td>5.392</td>
<td>1.707</td>
<td>0.192</td>
</tr>
<tr>
<td>Explained</td>
<td>30.279</td>
<td>3</td>
<td>10.093</td>
<td>3.195</td>
<td>0.032</td>
</tr>
<tr>
<td>Residual</td>
<td>148.466</td>
<td>47</td>
<td>3.169</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>178.745</td>
<td>50</td>
<td>3.575</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Variable - category</th>
<th>N</th>
<th>Unadjusted Dev'n Eta</th>
<th>Dev'n Beta</th>
<th>Adjusted for Independents Dev'n Eta</th>
<th>Dev'n Beta</th>
<th>Adjusted for Covariates Dev'n Eta</th>
<th>Dev'n Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>19</td>
<td>0.68</td>
<td>0.57</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burke</td>
<td>17</td>
<td>-0.20</td>
<td>-0.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tagmemic</td>
<td>15</td>
<td>-0.64</td>
<td>-0.36</td>
<td>0.30</td>
<td>0.25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multiple R squared

0.69

Multiple R

0.412
### Table 3.30
ANALYSIS OF COVARIANCE FOR POSTTEST FACTUALITY, SURPRISE VALUE, AND INSIGHTFULNESS AMONG THREE EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SATV</td>
<td>18.987</td>
<td>1</td>
<td>18.987</td>
<td>3.500</td>
<td>0.068</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>10.770</td>
<td>2</td>
<td>5.385</td>
<td>0.993</td>
<td>0.378</td>
</tr>
<tr>
<td>Explained</td>
<td>29.757</td>
<td>3</td>
<td>9.919</td>
<td>1.828</td>
<td>0.155</td>
</tr>
<tr>
<td>Residual</td>
<td>254.988</td>
<td>47</td>
<td>5.425</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>284.745</td>
<td>50</td>
<td>5.695</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Grand mean = 9.49</th>
<th>Adjusted for</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unadjusted independents = covariates</td>
</tr>
<tr>
<td>Variable = category</td>
<td>N</td>
</tr>
<tr>
<td>Groups</td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>19</td>
</tr>
<tr>
<td>Burke</td>
<td>17</td>
</tr>
<tr>
<td>Tagmenic</td>
<td>15</td>
</tr>
</tbody>
</table>

Multiple R squared
Multiple R .105
Multiple R .323
Comprehensiveness. The analysis of covariance on the pretest evaluation for "comprehensiveness" found no statistically significant difference among the four groups \((F=1.681, p=.182;\text{ see Table 3.32})\). 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 \((F=7.563, p=0.000;\text{ see Table 3.34})\). 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 \((F=3.613, p=.035;\text{ see Table 3.36})\). 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 \((F=1.334, p=.273;\text{ see Table 3.36})\). Again, the multiple
Table 3.32
ANALYSIS OF COVARIANCE FOR PRETEST COMPREHENSIVENESS OF IDEAS

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SATV</td>
<td>15.288</td>
<td>2</td>
<td>7.644</td>
<td>1.878</td>
<td>0.163</td>
</tr>
<tr>
<td>ECT</td>
<td>4.345</td>
<td>1</td>
<td>4.345</td>
<td>1.068</td>
<td>0.306</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>20.526</td>
<td>3</td>
<td>6.842</td>
<td>1.881</td>
<td>0.182</td>
</tr>
<tr>
<td>Explained</td>
<td>35.814</td>
<td>5</td>
<td>7.163</td>
<td>1.760</td>
<td>0.137</td>
</tr>
<tr>
<td>Residual</td>
<td>223.858</td>
<td>55</td>
<td>4.070</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>259.672</td>
<td>60</td>
<td>4.328</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Table 3.33
MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST COMPREHENSIVENESS OF IDEAS

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Unadjusted Dev'n Eta</th>
<th>Adjusted for independents Dev'n Beta</th>
<th>Adjusted for independents + covariates Dev'n Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>18</td>
<td>0.30</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td>Burke</td>
<td>15</td>
<td>-0.21</td>
<td>-0.09</td>
<td></td>
</tr>
<tr>
<td>Tagmemic</td>
<td>14</td>
<td>-1.00</td>
<td>-0.87</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>14</td>
<td>0.32</td>
<td>0.28</td>
<td></td>
</tr>
</tbody>
</table>

Multiple R squared

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple R</td>
<td>.188</td>
</tr>
<tr>
<td>Multiple R squared</td>
<td>.371</td>
</tr>
</tbody>
</table>
### Table 3.34
**ANALYSIS OF COVARIANCE FOR POSTTEST COMPREHENSIVENESS OF IDEAS**

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>9.944</td>
<td>2</td>
<td>4.972</td>
<td>0.832</td>
<td>0.441</td>
</tr>
<tr>
<td>SATV</td>
<td>0.381</td>
<td>1</td>
<td>0.381</td>
<td>0.080</td>
<td>0.807</td>
</tr>
<tr>
<td>ECT</td>
<td>7.309</td>
<td>1</td>
<td>7.309</td>
<td>1.223</td>
<td>0.274</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>135.632</td>
<td>3</td>
<td>45.211</td>
<td>7.563</td>
<td>0.000</td>
</tr>
<tr>
<td>Explained</td>
<td>145.576</td>
<td>5</td>
<td>29.115</td>
<td>4.870</td>
<td>0.001</td>
</tr>
<tr>
<td>Residual</td>
<td>328.785</td>
<td>55</td>
<td>5.978</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>474.361</td>
<td>60</td>
<td>7.906</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

### Table 3.35
**MULTIPLE CLASSIFICATION ANALYSIS FOR POSTTEST COMPREHENSIVENESS OF IDEAS**

<table>
<thead>
<tr>
<th>Variable + category</th>
<th>N</th>
<th>Unadjusted Dev's Eta</th>
<th>Adjusted for independents Dev's Beta</th>
<th>Adjusted for independents - covariates Dev's Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>18</td>
<td>1.72</td>
<td>1.68</td>
<td></td>
</tr>
<tr>
<td>Burke</td>
<td>15</td>
<td>0.04</td>
<td>0.23</td>
<td></td>
</tr>
<tr>
<td>Tagmemic</td>
<td>14</td>
<td>-0.09</td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>14</td>
<td>-2.16</td>
<td>-2.52</td>
<td>0.54</td>
</tr>
</tbody>
</table>

Multiple R squared .307
Multiple R .534
Table 3.36
ANALYSIS OF COVARIANCE FOR PRETEST COMPREHENSIVENESS OF IDEAS AMONG THREE EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>16.551</td>
<td>1</td>
<td>16.551</td>
<td>4.424</td>
<td>0.041</td>
</tr>
<tr>
<td>SATV</td>
<td>16.551</td>
<td>1</td>
<td>16.551</td>
<td>4.424</td>
<td>0.041</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>27.035</td>
<td>2</td>
<td>13.517</td>
<td>3.613</td>
<td>0.035</td>
</tr>
<tr>
<td>Explained</td>
<td>43.585</td>
<td>3</td>
<td>14.528</td>
<td>3.884</td>
<td>0.015</td>
</tr>
<tr>
<td>Residual</td>
<td>175.827</td>
<td>47</td>
<td>3.741</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>219.412</td>
<td>50</td>
<td>4.388</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Covariate</td>
<td>Raw regression coefficient</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SATV</td>
<td>0.008</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 53 cases were processed. 2 cases (3.9%) were missing.  

Table 3.37
MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST COMPREHENSIVENESS OF IDEAS AMONG THREE EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th>Variable - category</th>
<th>N</th>
<th>Adjusted for independents</th>
<th>Adjusted for covarilates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grand mean = 5.18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>X</td>
<td>Dev'n Eta</td>
<td>Dev'n Beta</td>
</tr>
<tr>
<td>Aristotle</td>
<td>19</td>
<td>0.88</td>
<td>0.78</td>
</tr>
<tr>
<td>Burke</td>
<td>17</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>15</td>
<td>-1.11</td>
<td>-1.04</td>
</tr>
<tr>
<td>Multiple R squared</td>
<td></td>
<td></td>
<td>0.39</td>
</tr>
<tr>
<td>Multiple R</td>
<td></td>
<td></td>
<td>.199</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.446</td>
</tr>
</tbody>
</table>
### Table 3.38

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

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>Signif of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>21.951</td>
<td>1</td>
<td>21.951</td>
<td>3.207</td>
</tr>
<tr>
<td>SATV</td>
<td>21.951</td>
<td>1</td>
<td>21.951</td>
<td>3.207</td>
</tr>
<tr>
<td>Main effects Groups</td>
<td>18.267</td>
<td>2</td>
<td>9.134</td>
<td>1.334</td>
</tr>
<tr>
<td>Explained</td>
<td>40.219</td>
<td>3</td>
<td>13.406</td>
<td>1.959</td>
</tr>
<tr>
<td>Residual</td>
<td>321.703</td>
<td>47</td>
<td>6.845</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>361.922</td>
<td>50</td>
<td>7.238</td>
<td></td>
</tr>
</tbody>
</table>

**Covariates** — 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**

<table>
<thead>
<tr>
<th>Variable - category</th>
<th>N</th>
<th>Unadjusted Dev’n Eta</th>
<th>Adjusted for independents Dev’n Eta</th>
<th>Adjusted for covariates Dev’n Eta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>19</td>
<td>0.21</td>
<td>0.26</td>
<td>0.26</td>
</tr>
<tr>
<td>Burke</td>
<td>17</td>
<td>-0.51</td>
<td>-0.45</td>
<td>-0.49</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>19</td>
<td>-0.57</td>
<td>0.26</td>
<td>0.26</td>
</tr>
</tbody>
</table>

Multiple R squared

Multiple R 0.333
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

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SATV</td>
<td>25.398</td>
<td>2</td>
<td>12.699</td>
<td>3.293</td>
<td>0.008</td>
</tr>
<tr>
<td>ECT</td>
<td>13.588</td>
<td>1</td>
<td>13.588</td>
<td>3.664</td>
<td>0.021</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>11.966</td>
<td>3</td>
<td>3.989</td>
<td>1.663</td>
<td>0.186</td>
</tr>
<tr>
<td>Explained</td>
<td>37.364</td>
<td>5</td>
<td>7.473</td>
<td>3.115</td>
<td>0.015</td>
</tr>
<tr>
<td>Residual</td>
<td>131.948</td>
<td>55</td>
<td>2.399</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>169.311</td>
<td>60</td>
<td>2.822</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

69 cases were processed.
9 cases (11.5%) were missing.

Table 3.41
MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST EVIDENCE OF INTELLECTUAL PROCESSING

<table>
<thead>
<tr>
<th>Variable - Category</th>
<th>N</th>
<th>Unadjusted Devn's Eta</th>
<th>Adjusted for independents Devn's Eta</th>
<th>Adjusted for covariates Devn's Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>18</td>
<td>0.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burke</td>
<td>15</td>
<td>-0.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tagmemic</td>
<td>14</td>
<td>-0.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>14</td>
<td>0.25</td>
<td>0.33</td>
<td>0.33</td>
</tr>
</tbody>
</table>

Multiple R squared: 0.221
Multiple R: 0.470
### Table 3.42
**ANALYSIS OF COVARIANCE FOR POSTTEST EVIDENCE OF INTELLECTUAL PROCESSING**

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SATV</td>
<td>5.924</td>
<td>2</td>
<td>2.962</td>
<td>0.708</td>
<td>0.497</td>
</tr>
<tr>
<td>ECT</td>
<td>2.643</td>
<td>1</td>
<td>2.643</td>
<td>0.632</td>
<td>0.499</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>167.310</td>
<td>3</td>
<td>55.770</td>
<td>13.332</td>
<td>0.000</td>
</tr>
<tr>
<td>Explained</td>
<td>173.234</td>
<td>5</td>
<td>34.647</td>
<td>8.262</td>
<td>0.000</td>
</tr>
<tr>
<td>Residual</td>
<td>230.078</td>
<td>55</td>
<td>4.183</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>403.311</td>
<td>60</td>
<td>6.722</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

69 cases were processed.
9 cases (11.5%) were missing.

### Table 3.43
**MULTIPLE CLASSIFICATION ANALYSIS FOR POSTTEST EVIDENCE OF INTELLECTUAL PROCESSING**

<table>
<thead>
<tr>
<th>Grand mean = 9.75</th>
<th>Adjusted for independents</th>
<th>Adjusted for covarlates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable - category</td>
<td>Unadjusted Dev's Eta</td>
<td>Dev's Beta</td>
</tr>
<tr>
<td>Groups</td>
<td>N</td>
<td>Dev's Eta</td>
</tr>
<tr>
<td>Aristotel</td>
<td>18</td>
<td>1.52</td>
</tr>
<tr>
<td>Burke</td>
<td>15</td>
<td>-0.09</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>14</td>
<td>0.75</td>
</tr>
<tr>
<td>Control</td>
<td>14</td>
<td>-2.61</td>
</tr>
</tbody>
</table>

Multiple R squared          | .420                      |
Multiple R                  | .455                      |
Table 3.44
ANALYSIS OF COVARIANCE FOR PRETEST EVIDENCE OF INTELLECTUAL PROCESSING AMONG THREE EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>26.900</td>
<td>1</td>
<td>26.900</td>
<td>10.742</td>
<td>0.002</td>
</tr>
<tr>
<td>SATV</td>
<td>26.900</td>
<td>1</td>
<td>26.900</td>
<td>10.742</td>
<td>0.002</td>
</tr>
<tr>
<td>Main effects</td>
<td>17.985</td>
<td>2</td>
<td>8.543</td>
<td>3.411</td>
<td>0.041</td>
</tr>
<tr>
<td>Groups</td>
<td>17.985</td>
<td>2</td>
<td>8.543</td>
<td>3.411</td>
<td>0.041</td>
</tr>
<tr>
<td>Explained</td>
<td>43.985</td>
<td>3</td>
<td>14.662</td>
<td>5.855</td>
<td>0.002</td>
</tr>
<tr>
<td>Residual</td>
<td>117.701</td>
<td>47</td>
<td>2.504</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>181.886</td>
<td>50</td>
<td>3.234</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Grand mean = 3.25</th>
<th>Adjusted for independents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable - category</td>
<td>Unadjusted Dev'n Eta</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>19</td>
</tr>
<tr>
<td>Burke</td>
<td>17</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple R squared</td>
<td></td>
</tr>
<tr>
<td>Multiple R</td>
<td></td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>22.132</td>
<td>1</td>
<td>22.132</td>
<td>4.122</td>
<td>0.048</td>
</tr>
<tr>
<td>SATV</td>
<td>22.132</td>
<td>1</td>
<td>22.132</td>
<td>4.122</td>
<td>0.048</td>
</tr>
<tr>
<td>Main effects Groups</td>
<td>10.107</td>
<td>2</td>
<td>5.053</td>
<td>0.941</td>
<td>0.397</td>
</tr>
<tr>
<td>Explained</td>
<td>32.239</td>
<td>3</td>
<td>10.746</td>
<td>2.001</td>
<td>0.127</td>
</tr>
<tr>
<td>Residual</td>
<td>252.388</td>
<td>47</td>
<td>5.370</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>284.627</td>
<td>50</td>
<td>5.693</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Variable + category</th>
<th>Grand mean[25]</th>
<th>Adjusted for independents</th>
<th>Adjusted for independents - covariates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Dev'n Eta</td>
<td>Dev'n Beta</td>
</tr>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>19</td>
<td>0.58</td>
<td>0.45</td>
</tr>
<tr>
<td>Burke</td>
<td>17</td>
<td>-0.87</td>
<td>-0.60</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>15</td>
<td>0.92</td>
<td>0.12</td>
</tr>
</tbody>
</table>

Multiple R squared
Multiple R
Table 3.48
ANALYSIS OF COVARIANCE FOR PRETEST OVERALL QUALITY OF IDEAS

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>15.060</td>
<td>2</td>
<td>7.530</td>
<td>2.414</td>
<td>0.099</td>
</tr>
<tr>
<td>SATV</td>
<td>4.017</td>
<td>1</td>
<td>4.017</td>
<td>1.238</td>
<td>0.281</td>
</tr>
<tr>
<td>ECT</td>
<td>1.277</td>
<td>1</td>
<td>1.277</td>
<td>0.409</td>
<td>0.525</td>
</tr>
<tr>
<td>Main effects</td>
<td>11.616</td>
<td>3</td>
<td>3.872</td>
<td>1.241</td>
<td>0.304</td>
</tr>
<tr>
<td>Groups</td>
<td>11.616</td>
<td>3</td>
<td>3.872</td>
<td>1.241</td>
<td>0.304</td>
</tr>
<tr>
<td>Explained</td>
<td>28.678</td>
<td>5</td>
<td>5.335</td>
<td>1.710</td>
<td>0.148</td>
</tr>
<tr>
<td>Residual</td>
<td>171.553</td>
<td>55</td>
<td>3.119</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>198.230</td>
<td>60</td>
<td>3.304</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Table 3.49
MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST OVERALL QUALITY OF IDEAS

<table>
<thead>
<tr>
<th>Grand mean = 4.79</th>
<th>Adjusted for independents</th>
<th>Adjusted for covariates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable - category</td>
<td>N</td>
<td>Dev’n Eta</td>
</tr>
<tr>
<td>Groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>18</td>
<td>0.71</td>
</tr>
<tr>
<td>Burke</td>
<td>15</td>
<td>-0.39</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>14</td>
<td>-0.57</td>
</tr>
<tr>
<td>Control</td>
<td>14</td>
<td>0.07</td>
</tr>
<tr>
<td>Multiple R squared</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple R</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>8.746</td>
<td>2</td>
<td>4.373</td>
<td>0.831</td>
<td>0.433</td>
</tr>
<tr>
<td>SATV</td>
<td>0.163</td>
<td>1</td>
<td>0.163</td>
<td>0.032</td>
<td>0.859</td>
</tr>
<tr>
<td>ECT</td>
<td>3.642</td>
<td>1</td>
<td>3.642</td>
<td>0.708</td>
<td>0.404</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>164.352</td>
<td>3</td>
<td>54.784</td>
<td>10.658</td>
<td>0.000</td>
</tr>
<tr>
<td>Explained</td>
<td>173.098</td>
<td>5</td>
<td>34.620</td>
<td>8.735</td>
<td>0.000</td>
</tr>
<tr>
<td>Residual</td>
<td>282.705</td>
<td>55</td>
<td>5.140</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>455.803</td>
<td>60</td>
<td>7.597</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Table 3.51
MULTIPLE CLASSIFICATION ANALYSIS FOR POSTTEST OVERALL QUALITY OF IDEAS

<table>
<thead>
<tr>
<th>Variable + category</th>
<th>N</th>
<th>Unadjusted Dev'n Eta</th>
<th>Adjusted for independents Dev'n Eta</th>
<th>Adjusted for independents - covariates Dev'n Beta</th>
<th>Multiple R squared</th>
<th>Multiple R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>13</td>
<td>1.74</td>
<td></td>
<td>1.68</td>
<td></td>
<td>.380</td>
</tr>
<tr>
<td>Burke</td>
<td>15</td>
<td>-0.20</td>
<td></td>
<td>0.02</td>
<td></td>
<td>.818</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>14</td>
<td>0.45</td>
<td></td>
<td>0.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>14</td>
<td>-2.48</td>
<td></td>
<td>-2.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple R squared</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple R</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.52
ANALYSIS OF COVARIANCE FOR PRETEST OVERALL QUALITY OF IDEAS AMONG THREE EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SATV</td>
<td>22.497</td>
<td>1</td>
<td>22.497</td>
<td>8.335</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>22.497</td>
<td>1</td>
<td>22.497</td>
<td>8.335</td>
<td>0.006</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>11.390</td>
<td>2</td>
<td>5.695</td>
<td>2.110</td>
<td>0.133</td>
</tr>
<tr>
<td></td>
<td>11.390</td>
<td>2</td>
<td>5.695</td>
<td>2.110</td>
<td>0.133</td>
</tr>
<tr>
<td>Explained</td>
<td>33.887</td>
<td>3</td>
<td>11.296</td>
<td>4.185</td>
<td>0.010</td>
</tr>
<tr>
<td>Residual</td>
<td>126.858</td>
<td>47</td>
<td>2.699</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>160.745</td>
<td>50</td>
<td>3.215</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Variable - category</th>
<th>N</th>
<th>Dev'n Eta</th>
<th>Dev'n Beta</th>
<th>Adjusted for independents</th>
<th>Adjusted for independents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>19</td>
<td>0.68</td>
<td>0.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burke</td>
<td>17</td>
<td>-0.14</td>
<td>-0.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tagmemic</td>
<td>15</td>
<td>-0.71</td>
<td>-0.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.32</td>
<td></td>
</tr>
<tr>
<td>Multiple R squared</td>
<td>.211</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple R</td>
<td>.459</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.54
ANALYSIS OF COVARIANCE FOR POSTTEST OVERALL QUALITY OF IDEAS AMONG THREE EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>21.591</td>
<td>1</td>
<td>21.591</td>
<td>3.281</td>
<td>0.076</td>
</tr>
<tr>
<td>SATV</td>
<td>21.591</td>
<td>1</td>
<td>21.591</td>
<td>3.281</td>
<td>0.076</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>18.764</td>
<td>2</td>
<td>9.382</td>
<td>1.426</td>
<td>0.251</td>
</tr>
<tr>
<td>Explained</td>
<td>40.356</td>
<td>3</td>
<td>13.452</td>
<td>2.044</td>
<td>0.121</td>
</tr>
<tr>
<td>Residual</td>
<td>309.330</td>
<td>47</td>
<td>6.581</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>349.686</td>
<td>50</td>
<td>6.994</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Grand mean = 9.25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable - category</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Groups</td>
</tr>
<tr>
<td>Aristotle</td>
</tr>
<tr>
<td>Burke</td>
</tr>
<tr>
<td>Tagmemic</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Multiple R squared

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>5.409</td>
<td>1</td>
<td>5.409</td>
<td>0.918</td>
<td>0.342</td>
</tr>
<tr>
<td>SATV</td>
<td>5.409</td>
<td>1</td>
<td>5.409</td>
<td>0.918</td>
<td>0.342</td>
</tr>
<tr>
<td>Main effects Groups</td>
<td>14.958</td>
<td>3</td>
<td>4.986</td>
<td>0.846</td>
<td>0.474</td>
</tr>
<tr>
<td>Explained</td>
<td>20.367</td>
<td>4</td>
<td>5.092</td>
<td>0.864</td>
<td>0.491</td>
</tr>
<tr>
<td>Residual</td>
<td>365.304</td>
<td>62</td>
<td>5.892</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>385.672</td>
<td>66</td>
<td>5.844</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 = 4.37

<table>
<thead>
<tr>
<th>Variable = category</th>
<th>Unadjusted</th>
<th>Adjusted for independents</th>
<th>Adjusted for covariates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Dev'n Eta</td>
<td>Dev'n Beta</td>
</tr>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>19</td>
<td>0.37</td>
<td>0.54</td>
</tr>
<tr>
<td>Burke</td>
<td>17</td>
<td>-0.55</td>
<td>-0.50</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>15</td>
<td>0.29</td>
<td>0.38</td>
</tr>
<tr>
<td>Control</td>
<td>16</td>
<td>-0.37</td>
<td>-0.45</td>
</tr>
</tbody>
</table>

Multiple R squared

Multiple R
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 ($F=0.822$, $p=0.487$). 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 ($F=2.354$, $p=0.081$; 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

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>9.354</td>
<td>1</td>
<td>9.354</td>
<td>1.462</td>
<td>0.231</td>
</tr>
<tr>
<td>SATV</td>
<td>9.354</td>
<td>1</td>
<td>9.354</td>
<td>1.462</td>
<td>0.231</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>34.554</td>
<td>3</td>
<td>11.518</td>
<td>1.800</td>
<td>0.156</td>
</tr>
<tr>
<td>Explained</td>
<td>43.908</td>
<td>4</td>
<td>10.977</td>
<td>1.716</td>
<td>0.158</td>
</tr>
<tr>
<td>Residual</td>
<td>396.659</td>
<td>62</td>
<td>6.398</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>440.567</td>
<td>66</td>
<td>6.675</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Variable - category</th>
<th>Adjusted for Independents</th>
<th>Adjusted for Covariates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>19</td>
<td>1.33</td>
</tr>
<tr>
<td>Burke</td>
<td>17</td>
<td>-0.96</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>15</td>
<td>-0.42</td>
</tr>
<tr>
<td>Control</td>
<td>16</td>
<td>0.20</td>
</tr>
</tbody>
</table>

Multiple R squared 0.30
Multiple R 0.100
Table 3.60
ANALYSIS OF COVARIANCE FOR MATURITY OF COMPOSITION PLAN

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>9.146</td>
<td>1</td>
<td>9.146</td>
<td>1.704</td>
<td>0.197</td>
</tr>
<tr>
<td>SATV</td>
<td>9.146</td>
<td>1</td>
<td>9.146</td>
<td>1.704</td>
<td>0.197</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>13.232</td>
<td>3</td>
<td>4.411</td>
<td>0.822</td>
<td>0.487</td>
</tr>
<tr>
<td>Explained</td>
<td>22.378</td>
<td>4</td>
<td>5.594</td>
<td>1.042</td>
<td>0.393</td>
</tr>
<tr>
<td>Residual</td>
<td>332.786</td>
<td>62</td>
<td>5.368</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>355.184</td>
<td>66</td>
<td>5.381</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Brand mean = 4.27</th>
<th>Variable = category</th>
<th>Unadjusted</th>
<th>Adjusted for independents</th>
<th>Adjusted for covariates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Groups</td>
<td></td>
<td>Dev'n Eta</td>
<td>Dev'n Beta</td>
</tr>
<tr>
<td></td>
<td>Aristotle</td>
<td>19</td>
<td>-0.48</td>
<td>0.64</td>
</tr>
<tr>
<td></td>
<td>Burke</td>
<td>17</td>
<td>-0.30</td>
<td>-0.44</td>
</tr>
<tr>
<td></td>
<td>Tagmemonic</td>
<td>15</td>
<td>-0.20</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>16</td>
<td>-0.27</td>
<td>0.20</td>
</tr>
</tbody>
</table>

Multiple R squared .063
Multiple R 251
### Table 3.62
ANALYSIS OF COVARIANCE FOR SUITABLE ARRANGEMENT
OF COMPOSITION PLAN

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SATV</td>
<td>7.701</td>
<td>1</td>
<td>7.701</td>
<td>1.138</td>
<td>0.290</td>
</tr>
<tr>
<td>SATV</td>
<td>7.701</td>
<td>1</td>
<td>7.701</td>
<td>1.138</td>
<td>0.290</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>47.797</td>
<td>3</td>
<td>15.932</td>
<td>2.354</td>
<td>0.081</td>
</tr>
<tr>
<td>Explained</td>
<td>35.498</td>
<td>4</td>
<td>13.875</td>
<td>2.050</td>
<td>0.098</td>
</tr>
<tr>
<td>Residual</td>
<td>419.696</td>
<td>62</td>
<td>6.769</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>475.194</td>
<td>66</td>
<td>7.200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Covariate Raw regression coefficient
SATV 0.004

49 cases were processed,
2 cases (2.9%) were missing.

### Table 3.63
MULTIPLE CLASSIFICATION ANALYSIS FOR SUITABLE ARRANGEMENT
OF COMPOSITION PLAN

<table>
<thead>
<tr>
<th>Variable - category</th>
<th>Unadjusted Deve's Eta</th>
<th>Adjusted for independents Deve's Eta</th>
<th>Adjusted for covariates Deve's Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aristotle</td>
<td>19</td>
<td>0.41</td>
<td>0.39</td>
</tr>
<tr>
<td>Burke</td>
<td>17</td>
<td>-1.18</td>
<td>-1.13</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>15</td>
<td>-0.50</td>
<td>-0.48</td>
</tr>
<tr>
<td>Control</td>
<td>16</td>
<td>1.21</td>
<td>1.16</td>
</tr>
</tbody>
</table>

Multiple R squared 0.342
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

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>0.596</td>
<td>1</td>
<td>0.596</td>
<td>0.108</td>
<td>0.746</td>
</tr>
<tr>
<td>SATV</td>
<td>0.596</td>
<td>1</td>
<td>0.596</td>
<td>0.108</td>
<td>0.746</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>33.234</td>
<td>3</td>
<td>11.078</td>
<td>1.962</td>
<td>0.129</td>
</tr>
<tr>
<td>Explained</td>
<td>33.830</td>
<td>4</td>
<td>8.458</td>
<td>1.498</td>
<td>0.214</td>
</tr>
<tr>
<td>Residual</td>
<td>350.080</td>
<td>62</td>
<td>5.646</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>383.910</td>
<td>66</td>
<td>5.817</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Grand mean = 6.39</th>
<th></th>
<th>Adjusted for independents + covariates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable + category</td>
<td>Unadjusted</td>
<td>Adjusted for independents</td>
</tr>
<tr>
<td>Groups</td>
<td>N</td>
<td>Dev'n Eta</td>
</tr>
<tr>
<td>Aristotle</td>
<td>19</td>
<td>0.93</td>
</tr>
<tr>
<td>Burke</td>
<td>17</td>
<td>-0.92</td>
</tr>
<tr>
<td>Tagmemic</td>
<td>15</td>
<td>-0.39</td>
</tr>
<tr>
<td>Control</td>
<td>18</td>
<td>0.24</td>
</tr>
</tbody>
</table>

Multiple R squared

.888

Multiple R

.297
### Table 3.66
ANALYSIS OF COVARIANCE FOR OVERALL IMPRESSION OF COMPOSITION PLAN

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Signif. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>4.312</td>
<td>1</td>
<td>4.312</td>
<td>0.741</td>
<td>0.393</td>
</tr>
<tr>
<td>SATV</td>
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<td>1</td>
<td>4.312</td>
<td>0.741</td>
<td>0.393</td>
</tr>
<tr>
<td>Main effects</td>
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<td>3</td>
<td>7.073</td>
<td>1.215</td>
<td>0.312</td>
</tr>
<tr>
<td>Groups</td>
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<td>3</td>
<td>7.073</td>
<td>1.215</td>
<td>0.312</td>
</tr>
<tr>
<td>Explained</td>
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<td>4</td>
<td>6.383</td>
<td>1.097</td>
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<tr>
<td>Residual</td>
<td>360.888</td>
<td>62</td>
<td>5.821</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>386.418</td>
<td>66</td>
<td>5.833</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

69 cases were processed. 2 cases (2.3%) were missing.

### Table 3.67
MULTIPLE CLASSIFICATION ANALYSIS FOR OVERALL IMPRESSION OF COMPOSITION PLAN

<table>
<thead>
<tr>
<th>Variable - category</th>
<th>N</th>
<th>Unadjusted Dev'n Eta</th>
<th>Adjusted for independents - covar.</th>
<th>Adjusted for independents</th>
</tr>
</thead>
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<tr>
<td>Groups</td>
<td></td>
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<td></td>
<td></td>
</tr>
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<td>Aristotle</td>
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<td>0.72</td>
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<tr>
<td>Burke</td>
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<td>-0.81</td>
<td></td>
</tr>
<tr>
<td>Tagmemic</td>
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<td>-0.18</td>
<td>-0.14</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>16</td>
<td>0.19</td>
<td>0.14</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Multiple R squared: 0.386
Multiple R: 0.257
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 all groups, although the control group only reached significance in the "insightfulness" of the ideas. Allowing more time for invention does not necessarily improve the quality of the ideas. The modules were particularly effective for encouraging individuals to think 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 some kind of answers to these five questions. . . ." Dramatically, 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 experimental group were the most varied. The correlation statistics on individual quantitative gains between the pretest and the posttest were negative: -0.401. Also, the correlation statistics on individual qualitative gains between the pretest and the posttest measures within this experiment were negative: -0.454 on factuality, insightfulness; -0.40 on comprehension, evidence of intellectual processing, overall quality. Simply stated, there was an unanticipated amount of change pretest and the posttest group. The data...
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 communication 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 teachers can pass some of their tedious "drill and practice" chores to the writing lab's computer, and 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 topos, 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 turning loose the wonders of the creative spirit on the micro-electronic revolution.

What is the future of CAI in the English curriculum? Will it be found in the drill and practice instructional programs only? Walter Naner (1975) foresees the day when generative computer-assisted instruction CAI 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
APPENDIX B: Listings
REM ** INVENTION PROGRAM: ARISTOTLE'S TOPICS **
REM ** AUTHOR: MUG BURNS **
REM ** THIS PROGRAM MAY BE USED ONLY WITH THE AUTHOR'S PERMIS
REM ** USE WITHOUT DIRECT PERMISSION VIOLATES COPYRIGHT LAW. **
REM
RND @X(38)
RND @Z(38)
EQU @C@Q@EJ888 "COUNTERS
PRINT 19280
PRINT 39188
PRINT 39118
PRINT 39128
PRINT 39138
PRINT 39148
PRINT 39158
PRINT 39168
PRINT 39178
PRINT 39188
PRINT 39198
PRINT 39208
PRINT 39218
PRINT 39228
PRINT 39238
PRINT 39248
PRINT 39258
PRINT "PLEASE TYPE IN YOUR FIRST NAME: "
INPUT 39268
IF 39278 THEN 39288
PRINT 39288
PRINT "NOW, "813", PLEASE TYPE IN YOUR LAST NAME: "
INPUT 39298
IF 39308 THEN 39318
IF 39318 THEN 39328
PRINT 39328
PRINT "HELLO, "813", I HOPE I CAN BE OF SOME ASSISTANCE"
PRINT "TO YOU TODAY, IF WE TAKE EACH OTHER SERIOUSLY, YOU'LL"
PRINT "THINK ABOUT YOUR TOPIC AS YOU NEVER HAVE BEFORE."
PRINT 39348
PRINT 39348
PRINT "BEFORE WE BEGIN, "813" THERE'S AN OLD"
PRINT "SAVING ABOUT COMPUTER-ASSISTED INSTRUCTION, IT GOES:" 
PRINT 39368
PRINT 39368
PRINT "GARBAGE IN, GARBAGE OUT!"
PRINT 39388
PRINT "IN OTHER WORDS, YOU AND I MUST WORK TOGETHER SO" 
PRINT "YOU CAN GET A GOOD START ON YOUR RESEARCH PAPER."
PRINT 39408
PRINT 39408
PRINT 39408
PRINT 39408
PRINT 
PRINT "WOULD YOU LIKE TO REVIEW THE DIRECTIONS AND THE COMMANDS?"
Goto 1570
REM ""DIRECTIONS AND COMMANDS"
1560 PRINT
1562 PRINT
1564 PRINT
1566 PRINT
1568 PRINT
1570 PRINT
1572 PRINT
1574 PRINT, "2. REMEMBER THAT I CAN ONLY READ ABOUT A LINE AND"
1576 PRINT, "A HALF OF INFORMATION AT THE TIME -- ABOUT THIS MUCH"
1578 PRINT

1579 ""---------------------------------------------------------------------""
1580 PRINT
1582 PRINT, "PRESS "RETURN TO CONTINUE")!"
1584 LINPUT 48
1586 PRINT
1588 PRINT, "5. AFTER YOU FINISH TYPING YOUR RESPONSE, YOU MUST PRESS"
1590 PRINT, "THE "RETURN" KEY. WHEN YOU DO, I'LL READ YOUR"
1592 PRINT, "RESPONSE AND SAY SOMETHING BACK TO YOU."
1594 PRINT
1596 PRINT
1598 PRINT, "6. THE MOST IMPORTANT OBJECTIVE OF THIS PROGRAM"
1600 PRINT, "IS TO GET YOU THINKING ABOUT YOUR TOPIC."
1602 PRINT
1604 PRINT, "7. IN ORDER TO ACHIEVE THIS OBJECTIVE,"
1606 PRINT, "YOU ARE GOING TO HAVE TO FORGET THAT I AM A MACHINE."
1608 PRINT
1610 PRINT, "PLEASE ASK QUESTIONS. YOU'LL BE SURPRISED BY HOW MUCH"
1612 PRINT, "I KNOW (OR SO I HOPE). I'M NOT"
1614 PRINT, "GUARANTEING THE TRUTH, BUT I'LL DO THE BEST I CAN!"
1616 PRINT
1618 PRINT
1620 PRINT
1622 PRINT, "HIT "RETURN TO CONTINUE")!"
1624 PRINT
1626 PRINT
1628 LINPUT 48
1630 PRINT
1632 PRINT
1634 PRINT
1636 PRINT, "COMMANDS"
PRINT "SIX THEMES HELP A WRITER (OR A SPEAKER) DISCOVER"
PRINT "SPECIFIC ARGUMENTS ABOUT SUBJECTS."
PRINT "IN HIS 'RHETORIC', ARISTOTLE TELLS US THAT THE AIM OF ORAL"
PRINT "SPEECH IS TO PERSUADE AN AUDIENCE. REMEMBER THAT THE"
PRINT "AIM IS TO PERSUADE."
PRINT "ARISTOTLE BELIEVED THAT IF HIS STUDENTS IN THE"
PRINT "ACADEMY ACHIEVED AND PRACTICED USING THE TOPICS, THEY WOULD BE"
PRINT "EFFECTIVE 'PERSUADERS'."
PRINT "YOU'LL RECOGNIZE AMONG THE TOPICS:"
PRINT "1. QUESTIONS OF DEFINITION;"
PRINT "2. QUESTIONS ABOUT CAUSES AND EFFECTS;"
PRINT "3. QUESTIONS REGARDING OPPOSITES AND ASSOCIATIONS;"
PRINT "4. QUESTIONS ABOUT CONSEQUENCES;"
PRINT "5. AND QUESTIONS ABOUT MATTERS OF FACT AND OPINION;"
PRINT "(Hit 'RETURN' TO CONTINUE.")"
INPUT AS "SUBJECT SEQUENCE >>>
PRINT "NOW I NEED TO FIND OUT WHAT YOU"
PRINT "ARE WRITING ABOUT. SO WOULD YOU PLEASE TYPE IN YOUR"
PRINT "SUBJECT, I AM LOOKING FOR ONE TO THREE WORDS.",
PRINT "THAT'S A MOUTHFUL. "NIS", MAKE IT SHORTER, LIKE A TITLE.",
PRINT "HERE ARE A FEW EXAMPLES!"
PRINT "THE ENERGY CRISIS"
PRINT "AUSTIN'S HISTORICAL GARDENS"
PRINT "THE BERMUDA TRIANGLE"
PRINT "YOUR TURN, WHAT IS YOUR SUBJECT?"
SUBROUTINE 1

198

IF PS THEN 2720
2240  GOTO 2300
2250  PRINT
2260  PRINT "YOUR REVISED SUBJECT IS "SS"."
2270  PRINT
2280  PRINT
2290  PRINT
2300  PRINT
2310  PLANT
2320  PRINT
2330  PRINT
2340  PRINT
2350  PRINT
2360  PRINT
2370  GOTO 210
2380  PRINT
2390  ON J GOTO 2400, 2440, 2460
2400  PRINT "INFORMAL ACKNOWLEDGEMENT OF SUBJECT"
2410  PRINT "ONLY ELECTRONICS; THAT'S WEIRD, I USED TO DATE A COMPUTER"
2420  PRINT "INTERESTED IN "SS".
2430  GOTO 2520
2440  PRINT
2450  PRINT "HEY, THAT'S NEAT, "NS": WE'LL HAVE A GOOD TIME THINKING"
2460  PRINT "ABOUT "SS".
2470  GOTO 2520
2480  PRINT
2490  PRINT "SS", 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 "SS".
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, . . . . "
2700  PRINT "(LIMIT: ONE LINE)"
2710  PRINT
2720  PRINT
2730  INPUT PS
2740  IF PS THEN 2720
2750  PRINT
2760  COMP 3321
2770  PRINT
2780  PRINT "FINE, "NS", YOU AND I WILL TALK AGAIN ABOUT YOUR"
2790  PRINT "PURPOSE."
2800  PRINT
2810  PRINT
2820  GOTO 3330
2830  PRINT "PURPOSE SUBROUTINE AT CALL"
PRINT "BEFORE WE CONTINUE, ""118", I WANT YOU"
22490 PRINT "TO THINK ABOUT YOUR PURPOSE ONCE AGAIN."
22495 PRINT
22500 PRINT "YOU HAVE ALREADY TOLD ME THAT YOUR PURPOSE WAS"
22505 PRINT "WITH"
22510 PRINT "HOW WOULD YOU COMPLETE THIS STATEMENT?"
22515 PRINT
22520 PRINT "IF NOTHING ELSE, I WANT MY READER TO UNDERSTAND..."
22525 PRINT "ONE LINE, PLEASE"
22530 PRINT
22535 INPUT #18
22540 IF #18" THEN 24000
22545 GO TO 33320
22550 PRINT "YOUR PURPOSE IS:" & C118"
22555 PRINT GOTO 33320
22560 PRINT "PURPOSE SUBROUTINE AT C+112"
22565 IF #18" THEN 33320
22570 PRINT "LET'S PAUSE ONCE AGAIN TO CONSIDER YOUR INTENT."
22575 PRINT
22580 PRINT "YOUR GENERAL PURPOSE IS:" & C118"
22585 PRINT "ALSO, YOU WANT YOUR READER TO UNDERSTAND"
22590 PRINT "THEIR"
22595 PRINT "IS THERE ANYTHING ELSE YOU WISH TO SAY ABOUT PURPOSE?"
22600 PRINT "(YES OR NO)?"
22605 IF #18 = "YES" THEN 33320
22610 PRINT "IS THERE ANYTHING ELSE YOU WISH TO SAY ABOUT PURPOSE?"
22615 IF #18 = "NO" THEN 33320
22620 PRINT "FINE, ""118", ENOUGH ABOUT PURPOSE," & C118"
22625 GOTO 33390
22630 PRINT "GREAT, ""118", WHAT WOULD YOU LIKE TO ADD?"
22635 PRINT "ONE LINE ONLY!"
22640 PRINT
22645 INPUT #28
22650 IF #28" THEN 33320
22655 GOSUB 33220
22660 RETURN
22665 PRINT "ANY MORE?"
22670 PRINT "(IF SO, TYPE WHATEVER IT IS; IF NOT, TYPE "NO")."
22675 PRINT
22680 PRINT
22685 INPUT #11
RETURN "BEGIN OPENING QUESTIONING SEQUENCE"

PRINT "RELAX NOW, THIS, AND ENJOY THIS BRAINSTORMING SESSION."

PRINT "AP4 ga'i0 Tool"

PRINT "STORING SESSION."

PRINT "AP4 ga'i0 Tool"

PRINT "CONTROLS"

PRINT "TOTAL POOL. ALL"

PRINT "OPPOSITE"

PRINT "QUESTION POOL FOR ANTHROPOLOGY TOPICS"

PRINT "WHAT IS THE OPPOSITE OF "IS?"

PRINT "IS 454"

PRINT "ARE EACH WORD OF "IS" INDIVIDUALLY"

PRINT "WHAT DOES IT MEAN? CONNOTATIONS? DENOTATIONS?"

PRINT "WHAT IS THE MOST LIKELY PLACE FOR"

PRINT "IS TO EXIST?"

PRINT "HOW DOES TIME AFFECT "IS?"

PRINT "WHAT SPECIAL EXPERIENCES MADE YOU SELECT"

PRINT "IS AS YOUR TOPIC?"
A programming code listing.

```
23410  GOTO 5858
23420  PRINT "DEFINE "SS»,"
23430  GOTO 5858
23440  PRINT "FILL IN THE BLANK IF "SS»,"
23450  GOTO 5858
23460  PRINT "FILL IN THE BLANK IF "SS
23470  PRINT "THE CONSEQUENCES OF".
23480  GOTO 5858
23490  PRINT "DIVIDE "SS INTO THREE".
23500  PRINT "SUBTOPICS."
23510  GOTO 5858
23520  PRINT "WHAT MIGHT BELIEVE THAT THE CONSEQUENCES OF
23530  WHAT ARE THE GOOD CONSEQUENCES OF".
23540  GOTO 5858
23550  PRINT "WHAT ARE THE BAD CONSEQUENCES OF"
23560  PRINT "WHAT MAKES YOU SOMETHING OF AN AUTHORITY ON "SS"?
23570  GOTO 5858
23580  PRINT "WHO GIVES (AND WHO RECEIVES) "SS"?
23590  GOTO 5858
23600  PRINT "DISCUSSED SEPARATELY?"
23610  GOTO 5858
23620  PRINT "DOES PUBLIC OPINION ABOUT "SS
23630  PRINT "DIFFER FROM PRIVATE OPINION?"
23640  GOTO 5858
23650  PRINT "DO ALL ASPECTS OF "SS MAKE".
23660  PRINT "SENSE TO YOU DESCRIPTIVE THOSE THAT DO NOT."
23670  GOTO 5858
23680  PRINT "DO THE GENERAL PUBLIC FEEL"
23690  PRINT "ABOUT "SS"
23700  GOTO 5858
23710  PRINT "WHAT COULD BE CONSIDERED A RESULT"
23720  PRINT "OF "SS"?
23730  GOTO 5858
23740  PRINT "WHAT COULD BE CONSIDERED A CAUSE"
23750  PRINT "OF "SS"?
23760  GOTO 5858
23770  PRINT "ARE THE RESULTS OF "SS USUALLY"
23780  PRINT "SAME DESCRIBE."
23790  GOTO 5858
23800  PRINT "WHAT MOTIVATES PEOPLE TOWARDS"
23810  PRINT "AGAINST "SS"?
23820  GOTO 5858
23830  PRINT "WHAT WILL MAKE PEOPLE CHANGE THEIR "SS"?"
```
203

55982 IF INCH=40 THEN 4422
55986 JSK="STOP1"
55988 GOSUB 4496
55990 IF I<1 THEN 1932
55992 JSK="REPEAT1"
55994 GOSUB 4496
55996 IF K<1 THEN 7428
55998 IF I="*" THEN 4790
56000 JSK="DIRECTIONS1"
56002 GOSUB 4496
56004 OR
56006 IF K<1 THEN 4422
56008 JSK="CHWENT2"
56010 GOSUB 4496
56012 IF I<1 THEN 4422
56014 JSK="WHY2"
56016 GOSUB 4496
56018 IF K<1 THEN 4422
56020 JSK="AND2"
56022 GOSUB 4496
56024 IF K<1 THEN 4728
56026 JSK="EXPLAIN2"
56028 GOSUB 4496
56030 IF K<1 THEN 7478
56032 JSK="PLANET"
56034 GOSUB 4496
56036 IF K<1 THEN 7478
56038 JSK="CHANGE2"
56040 GOSUB 4496
56042 IF K<1 THEN 4728
56044 JSK="WHAT2"
56046 GOSUB 4496
56048 IF K<1 THEN 7478
56050 JSK="OF"
56052 GOSUB 4496
56054 IF K<1 THEN 4728
56056 JSK="OR"
56058 GOSUB 4496
56060 IF K<1 THEN 7478
56062 JSK="CAM1"
56064 GOSUB 4496
56066 IF K<1 THEN 7478
56068 JSK="IT"
56070 GOSUB 4496
56072 IF K<1 THEN 4728
56074 JSK="BECAUSE"
56076 GOSUB 4496
56078 IF K<1 THEN 7478
56080 JSK="STOP2"
56082 GOSUB 4496
56084 IF K<1 THEN 7118
56086 JSK="COUNTER TO CONTINUE AUTOMATICALLY"
56088 GOSUB 4496
56090 IF K<1 THEN 5768 "PREVENTS SHORT RESPONSES AFTER & COMMAND"
56092 JSK="COUNTER TO CONTINUE AUTOMATICALLY"
56094 GOSUB 4496
56096 IF LEN(1)<10 THEN 7268
56098 ALEN(1) "CHECKS LENGTH OF INDIVIDUAL WORDS IN STRING"
56100 FOR K=1 TO A-1
56102 IF I<1018,AK<110 THEN 5713
IIS694
IF
XIs
THEN
SINS
EXPLANATION BRANCHING AND FEEDBACK

PRINT

PRINT

IF E3>1 THEN 9338
C F1 GOTO 5858,5878,5898,5918
PRINT "GOOD, "N13", ADD TO YOUR RESPONSE NOW."
GOTO 5958
PRINT "FINE, "N13", WRITE SOME MORE.
GOTO 5958
PRINT "THAT'S THE IDEA, "N13", GIVE US SOME MORE INFO NOW."
GOTO 5958
PRINT "BY GEORGE, "N13", GOOD ONE, WRITE A LITTLE MORE PLEASE."
GOTO 5958
PRINT "SUPE", "N13";
GOTO 4030
PRINT "OUTSTANDING, "N13";
GOTO 4030
PRINT "FANTASTIC, "N13";
GOTO 4030
PRINT "TERRIFIC, "N13";
GOTO 4030
PRINT "GREAT, "N13";
PRINT
E3E3=1: 'ENCOUNTER FOR FULLY EXPLORED QUESTIONS
PRINT "ANYTHING ELSE?"
IF E3>2 THEN 5118
PRINT "YOU CAN ADD MORE INFO, ASK A"
PRINT "QUESTION, OR GIVE A COMMAND ---"
PRINT "WHATSOEVER YOU <13h,>)"
PRINT
CASE "YES"
GOSUB 4468
IF <1: THEN 6768
L046
GOTO 5188
PRINT
PRINT "OKAY."
PRINT
IF C=13 THEN 7290
IF C=14 THEN 7290
IF C=15 THEN 2818
IF C=20 THEN 3858
PRINT
PRINT
CASE (I3h+1)
C H GOTO 4378,4298,4218,4338,4358,4578,4398,441d,4e50,4e50
PRINT "(SEE IF YOU CAN USE SOME MORE ACTION VERBS IN YOUR RESPONSE.)"
GOTO 4638
PRINT "(REMEMBER NOT TO GRAB ABOUT SPELLING!!)"
GOTO 4638
PRINT "(I'LL EXPLAIN MORE IF YOU ASK ME ON THIS NEXT QUESTION.)"
GOTO 4638
PRINT "(AFTER I ASK THIS NEXT QUESTION, TYPE "WHAT?" AND STAND A"
")"
GOTO 4640
PRINT "(SEE IF YOU CAN USE THE WORD "BECAUSE" IN YOUR NEXT ANSWER.)"
GOTO 4640
PRINT "(IF YOU DON'T UNDERSTAND, JUST SAY SO NEXT TIME, I'LL HE"
")"
GOTO 4640
PRINT "(I REPEAT QUESTIONS IF YOU TYPE "REPEAT!")"
GOTO 4640
PRINT "(IF YOU NEED MORE TIME, TYPE "&" AT THE END OF A LINE.)"
GOTO 4640
PRINT "(TRY USING SOME MORE VERBS FOR BETTER EXPLANATIONS.)"
GOTO 4640
PRINT "(TRY EXPLAINING A LITTLE MORE, LESS PREFERENCES, MORE SENTEN"
CES.)"
PRINT
PRINT
PRINT
PRINT
PRINT "(SEE IF YOU CAN USE SOME MORE ACTION VERBS IN YOUR RESPONSE.")"
PRINT
PRINT
PRINT "(REMEMBER NOT TO GRAB ABOUT SPELLING!!)"
PRINT
PRINT "(I'LL EXPLAIN MORE IF YOU ASK ME ON THIS NEXT QUESTION.)"
PRINT
PRINT "(AFTER I ASK THIS NEXT QUESTION, TYPE "WHAT?" AND STAND A"
")"
PRINT
PRINT "(SEE IF YOU CAN USE THE WORD "BECAUSE" IN YOUR NEXT ANSWER.)"
PRINT
PRINT "(IF YOU DON'T UNDERSTAND, JUST SAY SO NEXT TIME, I'LL HE"
")"
PRINT
PRINT "(I REPEAT QUESTIONS IF YOU TYPE "REPEAT!")"
PRINT
PRINT "(IF YOU NEED MORE TIME, TYPE "&" AT THE END OF A LINE.)"
PRINT
PRINT "(TRY USING SOME MORE VERBS FOR BETTER EXPLANATIONS.)"
PRINT
PRINT "(TRY EXPLAINING A LITTLE MORE, LESS PREFERENCES, MORE SENTEN"
CES.)"
INT IF ANSWERS TO SINGLE QUESTION

"ARM CI3")

1.1 pa 9114 77**Sa*AMEAO,**41S0. ASK. I'LL 00 T.H(ST I CAN.-

*67'S acTo 5050 6769g SOL%.? ANSWERS A0VE. To ANYTHING ELSE?

PRINT *W64AT76 2%440 GOTO lsse

Note POINT 'ANSWES IN QUESTION e40N,?*

"I COULD SAY THAT'S FOR ME TO KNOW AND FOR YOU TO FIN O OUT."

PRINT "SERIOUSLY, I CANNOT PRETEND TO KNOW "NOW", BUT YOU"

PRINT "SHOULD KEEP EXPLORING FOR AN ANSWER."

PRINT "ASK. I'LL TRY IT OUT."

PRINT "WELL, WHY NOT? REMEMBER WE ARE EXPLORING, BRAINSTORMING;"

PRINT "ANSWERS THE QUESTION "WHY?"

PRINT "GOOD FOR YOU. "N13", NOT EVERY WRITER NARROWS OR"

PRINT "CHANGES HIS OR HER TOPIC THIS EARLY IN THE INVENTION PROC"

PRINT "PLEASE TYPE IN YOUR NEW SUBJECT:";

PRINT "ANSWERS QUESTION + OR -?":

PRINT "WHATSOEVER YOU THINK BEST, "N13", YOU DECIDE."

PRINT "ANSWERS QUESTION CAN I ?":

PRINT "YES, OF COURSE."

PRINT "RESPONS TO SUBORDINATE "BECAUSE"

PRINT "I LIKE YOUR REASONING."

PRINT "RESPONS TO +?"

PRINT "RESPONS TO SUBORDINATE "BECAUSE"

PRINT "ANOTHER INTERESTING QUESTION, I'M SAY "YES"."

PRINT "YES, THAT SEEMS OKAY."

PRINT "THIS QUESTION MAY BE BETTER ANSWERED"}

PRINT "DURING THE RESEARCH PHASE, KEEP IT IN MIND."

PRINT "RESPONS TO SHORT ANSWERS"

PRINT "AHHH, SHORT AND SWEET, NOT TELL ME"

PRINT "IN OTHER WORDS, ELABORATE A LITTLE."

PRINT "AUTO NARROW/CHANGE LOOP"
207

PRINT "DO YOU WISH TO NARROW OR CHANGE YOUR SUBJECT?"
27320 PRINT "(MAYBE REVISE THE WAY IT SOUNDS IN THESE QUESTIONS?)"
27330 PRINT "(YES OR NOT)"
27340 LET * = * + 1
27350 GOSUB 4440
27360 IF * THEN 6920
27370 PRINT
27380 PRINT
27390 PRINT
27400 GOTO 4213
27410 PRINT "REPRINTS QUESTION"
27420 GOTO 4213
27430 IF * THEN 3740
27440 IF * THEN 3750
27450 IF * THEN 3740
27460 IF * THEN 3770
27470 REM "<<< CLARIFICATION ARRAY AND EXAMPLE SEQUENCE >>>"
27480 PRINT
27490 IF * THEN 0990
27500 IF * THEN 0990
27510 IF * THEN 7610
27520 IF * THEN 7620
27530 IF * THEN 7570
27540 IF * THEN 7580
27550 IF * THEN 7590
27560 GOTO 7620
27570 GOTO 7630
27580 GOTO 7630
27590 PRINT "INTERPRETATION"
27600 GOTO 7640
27610 ON 91 GOTO 7650,8324,8908,8980,7900,7960,8990,9770,8700,8190
27620 ON 91 GOTO 4200,7750,8120,8480,8930,8570,8020,8670,8120,8760
27630 ON 91 GOTO 4440,7690,8660,9470,9130,9760,8770,8770,8770,8770
27640 ON 91 GOTO 4440,7690,8660,9470,9130,9760,8770,8770,8770,8770
27650 PRINT "SOMETIMES A GOOD WAY TO DESCRIBE SOMETHING IS MY TELLING"
27660 PRINT "THAT IT IS NOT. THERE MAY OR MAY NOT BE A DIRECT"
27670 PRINT "OPPOSITE OF "SS", BUT"
27680 PRINT "SEE IF YOU CAN THINK OF ONE."
27690 PRINT
27700 PRINT "FOR EXAMPLE, IF I WERE WRITING A PAPER ON SOLAR"
27710 IF * THEN 4440
27720 PRINT "ENERGY, AN ANSWER TO THIS QUESTION MIGHT PRODUCE A"
27730 PRINT "LIST OF EARTH'S NATURAL ENERGY RESOURCES."
27740 GOTO 9940
27750 PRINT "A 'CONNOTATION' IS AN ASSOCIATION; A 'DENOTATION' IS"
27760 PRINT "A DICTATORIAL MEANING, THIS TACTIC OF THINKING ABOUT"
27770 PRINT "THE INDIVIDUAL WORDS IN A TOPIC OFTEN BRINGS"
27780 PRINT "A FRESH INSIGHT,"
27790 GOTO 9930
27800 PRINT "WHERE SHOULD I GO TO SEE "SS"?"
27810 PRINT "CAN I GO INSIDE? CAN I GO OUTSIDE? WHY OR WHY NOT?"
27820 GOTO 9940
27830 PRINT "ARISTOTLE THOUGHT ABOUT TIME AND CHANGE OFTEN. DOES"
27840 PRINT "SS CHANGE OVER TIME?"
27850 PRINT
27860 PRINT "FOR EXAMPLE, IF I WERE WRITING A PAPER ABOUT DIAMOND MINI"
27870 PRINT "NG."
27880 PRINT "I MIGHT WANT TO RESEARCH HOW TECHNOLOGY HAS CHANGED THE"
27890 PRINT "MINING PROCESS."
GOTO 9938
PRINT "IF YOU HAVE A GOOD ANSWER HERE, YOU WILL PROBABLY WRITE"
PRINT "A DECENT PAPER. BY "SPECIAL", I MEAN "UNIQUE"," "INTERESTING"," OR "IMPORTANT". THESE EXPERIENCES DO NOT"
PRINT "NECESSARILY HAVE TO BE YOURS; YOU COULD PRETEND TO BE A"
PRINT "REPORTER.,"
GOTO 9938
PRINT "YOU MIGHT SPEND ALL DAY ON THIS QUESTION, BUT I AM"
PRINT "AFTER A SHORT DEFINITION, IN LESS THAN TWENTY WORDS,"
PRINT "WHAT IS "5977?"
GOTO 9938
PRINT "THIS IS A TYPE OF INDUCTION, "418". I AM NOT TRYING"
PRINT "TO BE TRICKY, IN OTHER WORDS, IF YOUR TOPIC EXISTS,"
PRINT "THEN OTHER THINGS—FEELINGS, ACTIONS, ETC.—ALSO EXIST,"
PRINT "TRY MAKING A CONNECTION OR TWO."
GOTO 9938
PRINT "THIS QUESTION ASKS YOU TO CREATE A COMPLICATED"
PRINT "INDUCTION. THINK OF IT IN MATHEMATICAL TERMS:"
PRINT "3F 2 + 7 THEN 7?"
PRINT "THERE ARE MANY ANSWERS (2+2=4, 2=40=42,...)."
GOTO 9938
PRINT "I LIKE ASKING THIS QUESTION BECAUSE IT MAY HELP YOU ORGAN"
PRINT "IZE";
PRINT "YOUR PAPER. WHAT ARE THREE OF THE MAJOR PARTS THAT CREATE"
PRINT "THE WHOLE OF "5977?
PRINT "YOU MIGHT WANT TO WRITE SOMETHING HERE ABOUT HOW THESE"
PRINT "PARTS ARE RELATED.,"
GOTO 9938
PRINT "DECREASING DECISIONS HAVE BEEN MADE ABOUT "5977."
PRINT "WHAT WERE THEY ABOUT? AND MADE THEM?"
PRINT "FOR EXAMPLE, IF I WERE WRITING A PAPER ABOUT INFLATION,"
PRINT "I WOULD WANT TO WRITE A PARAGRAPH OR TWO ABOUT THE"
PRINT "GOVERNMENT'S LEGISLATION TO DATE,"
GOTO 9938
PRINT "WHAT DECISIONS WILL HAVE TO BE MADE IN THE FUTURE"
PRINT "CONCERNING "5977."
PRINT "FILL IN THE BLANKS: CONCERNING "5977,"
PRINT "WE MUST DECIDE WHETHER OR NOT TO DO "
GOTO 9938
PRINT "WHAT GOOD WILL COME ABOUT FROM "ANKINO'S CONCERN ABOUT"
PRINT "5977?"
PRINT "FOR EXAMPLE, IF I WERE WRITING A PAPER ABOUT COLLEGE"
PRINT "ACADEMICS, SOME OF THE GOOD CONSEQUENCES MAY BE A BETTER"
PRINT "JOB IN THE FUTURE; A FULLER UNDERSTANDING"
PRINT "ABOUT OUR WORLD, AND AN APPRECIATION FOR GOOD STUDY HARD";
PRINT ","
PRINT "STOP THE SNICKERING AND GET ON WITH AN ANSWER.")"
GOTO 9938
PRINT "WHAT BAD WILL COME ABOUT FROM "ANKINO'S CONCERN ABOUT"
PRINT "5977?"
WHAT AAS. IS, AND WILL RE THE "BAD NEWS!"

PRINT "ANY NOT?"

PRINT "HERE, "AIS, WE ARE SEARCHING FOR THE PEOPLE WHO"

PRINT "HAVE COUNTER-ARGUMENTS, LAWYERS ARE ALWAYS INTERESTED"

PRINT "IN THIS PARTICULAR QUESTION, MOST ISSUES WE WRITE ABOUT"

PRINT "ARE NOT THAT CLEAR-CUT, NOT THAT "BLACK AND WHITE."

GOTO 9438

PRINT "BY "AUTHORITY", I MEAN A SO-CALLED EXPERT,"

PRINT "AS YOU WRITE THE PAPER, YOU MAY QUOTE THESE PEOPLE,"

PRINT "GENERALLY, THEIR OPINIONS ARE RESPECTED--IF NOT RELIEVED,"

GOTO 9946

PRINT "I AM OFTEN SURPRISED BY THE CREATIVE ANSWERS TO THIS"

PRINT "QUESTION, THERE IS USUALLY AN INSIGHT IN UNDERSTANDING"

PRINT "THESE ROLES, BY "GIVES", I MEAN "RESPONSIBLE FOR"

PRINT "RECEIVES", I MEAN "ACCEPTING THE CONSEQUENCES OF"

GOTO 9480

PRINT "YOU PROBABLY DON'T THINK OF YOURSELF AS AN AUTHORITY,"

PRINT "SO PRETEND THAT YOU ARE, WHAT CREDENTIALS DO YOU THINK A"

PRINT "AUTHORITY ON "ASS" SHOULD HAVE?"


GOTO 9946

PRINT "BEFORE SOMEONE CAN UNDERSTAND "ASS",

PRINT "WHAT MATTERS MUST BE UNDERSTOOD BY THEMSELVES,"

GOTO 9480

PRINT "PUBLIC OPINION", I MEAN THE POPULAR POINT OF VIEW,"

PRINT "PRIVATE OPINION", I MEAN THE WAY PEOPLE ACTUALLY BELIEVE,"

PRINT "SOMETIMES, SUCH IRONIC DIFFERENCES HIGHLIGHT THE OLD ADAGI"

PRINT ""DO WHAT I SAY, NOT WHAT I DO;"

PRINT "FOR EXAMPLE, MANY FREE AND LIBERAL THINKERS MAY BE MORE"

PRINT "CONSERVATIVE IN MAKING POLITICAL DECISIONS,"

GOTO 9480

PRINT "THIS QUESTION IS INTENDED TO FIND OUT WHAT YOU DO NOT"

PRINT "KNOW ABOUT "ASS".

PRINT "SO, MAKE A LIST OF THOSE THINGS THAT ARE UNCLEAR -- THE"

PRINT "MOST WAY TO NEW INSIGHTS,"

GOTO 9480

PRINT "WHAT ARE THE "MOST POPULAR OPINIONS REGARDING"

PRINT "ASS?"

PRINT "SHOULD JUST MENTION THE EFFECTS, THE RESULTS, THE"

PRINT "OUTCOMES OF "ASS?"

PRINT "FOR EXAMPLE, IF I WERE WRITING A PAPER ABOUT EXERCISE,"

PRINT "WOULD WRITE ABOUT A STRONGER HEART, A FEELING"

PRINT "ALERTNESS, AND ANOTHER WAY TO SPEND MONEY (JOGGING SHOES,"

PRINT "IN OTHER WORDS, WHAT WAS, IS, AND WILL BE THE "BAD NEWS!"

PRINT "NO"
PRINT "HERE ARE TEN SCIENTIFICS TACTICS THAT HAVE BEEN PROVEN TO WORK:" 
PRINT "1. USE THE FACTS:" 
PRINT "2. USE THE ARGUMENTS:" 
PRINT "3. USE THE EMOTIONS:" 
PRINT "4. USE THE EXAMPLES:" 
PRINT "5. USE THE EXPERTS:" 
PRINT "6. USE THE COMPARISONS:" 
PRINT "7. USE THE ANALOGIES:" 
PRINT "8. USE THE SYMBOLS:" 
PRINT "9. USE THE ANAGRAMS:" 
PRINT "10. USE THE HUMOR:"
PRINT "WHAT PROBLEMS DO YOU HAVE UNDERSTANDING?
PRINT "IF YOU EXPECT PEOPLE TO BE CONVINCED BY YOUR ARGUMENT,"
PRINT "YOU MUST OFFER THEM A SOUND SOLUTION.
PRINT "SOMETIMES IT IS A MISTAKE TO TRY TO SUGGEST A BETTER"
PRINT "SOLUTION TO ANY PROBLEMS ASSOCIATED WITH IT."
PRINT "IF PEOPLE ARE CONCERNED ABOUT WHAT YOU SAY,"
PRINT "YOU NEED TO BE CONVINCED AT YOUR ARGUMENT,"
PRINT "IF EVERYONE IN THE WORLD IS AS CONCERNED ABOUT WHAT YOU SAY,"
PRINT "YOU HAVE A BETTER FOR THIS TOPIC,"
PRINT "SIMPLY, WHAT HAS BEEN WRONG WITH THE WAY"
PRINT "35% HAS BEEN HANDLED,"
PRINT "MAY ALSO SUGGEST THAT SOME THINGS ABOUT"
PRINT "CHANGE MORE OFTEN."
PRINT "THAN OTHER THINGS, WHAT MIGHT THEY BE?"
PRINT "PROMPTERS AFTER CLARIFICATION"
PRINT "TRY ANSWERING THIS QUESTION NOW."
PRINT "WHAT ARE YOU THINKING NOW, "NICE?"
PRINT "YOUR TURN, "NICE?"
PRINT "SECOND RESPONSE AFTER CLARIFICATION REQUEST"
PRINT "THAT'S ABOUT ALL I CAN ADD AT THE MOMENT, SORRY!
PRINT "CLOSING SEQUENCES >>
PRINT "YOU EXPLORED QUESTIONS OUT OF THE CT I ASKED,"
PRINT "THAT'S (63%) 100% PERCENT,"
PRINT "LET ME REMIND YOU THAT YOU ARE STILL IN THE FIRST STAGES"
REM <<< INVENTION PROGRAM: BURKE'S ORAMATISTIC PENTAD >>>
REM <<< AUTHOR: HUGH BURNS >>>
REM <<< THIS PROGRAM MAY BE USED ONLY WITH THE AUTHOR'S PERM
ISSION. REM USE WITHOUT DIRECT PERMISSION VIOLATES COPYRIGHT LAW. >>

20020 RANDOMIZE
20025 HEAD (100)
20030 T (100)
20035 X(100)
20040 E(100)
20045 G(100)
20050 P(100)
20055 COUNTERS
20060 PRINT
20065 PRINT "A COMPUTER-ASSISTED INVENTION PROGRAM"
20070 PRINT "---------------------------------------------"
20075 PRINT
20080 PRINT "A COMPUTER-ASSISTED INVENTION PROGRAM"
20085 PRINT "---------------------------------------------"
20090 PRINT
20095 PRINT "BURKE'S ORAMATISTIC PENTAD"
20100 PRINT
20105 PRINT
20110 PRINT
20115 PRINT INPC4TTATION, PLEASE TYPE "NO" IF YOU WANT TO EXIT.
20120 PRINT "YOU CAN GET A GOOD START ON YOUR RESEARCH PAPER."
PRINT "WOUL YOU LIKE TO REVIE THE DIRECTIONS AND COMMANDS?"
1030 IF 1 THEN GOSUB 5590
1035 GOTO 1470
1040 REM "DIRECTIONS"
1045 PRINT
1050 PRINT "1. WHEN YOU MAKE A TYPING ERROR, "BACKSPACE" AND"
1055 PRINT "HOLD TO CORRECT IT. USE THE "RUBOUT" OR "RUB","
1060 PRINT "THE "SHIFT" MUST BE DERESSED WHEN YOU "RUBOUT".",
1065 PRINT "IT MAY LOOK A LITTLE FUNNY (LIKE WRITING BACKWARDS)."
1070 PRINT "BUT DON'T WORRY IT WORKS THAT WAY."
1075 PRINT
1080 PRINT "NOTE: SPELLING IS NOT CRUCIAL TO INVENTION.","
1085 PRINT
1090 PRINT "2. REMEMBER THAT I CAN ONLY READ ABOUT A LINE ANO"
1095 PRINT "A HALF OF INFORMATION AT ONE TIME -- ABOUT THIS MUCH!",
1100 PRINT
1105 PRINT "3. IF YOU MAKE A TYPING ERROR, YOU MUST PRESS",
1110 PRINT "THE "RETURN" KEY."
1115 PRINT
1120 PRINT "4. THE MOST IMPORTANT OBJECTIVE OF THIS PROGRAM"
1125 PRINT "IS TO SET YOU THINKING ABOUT YOUR TOPIC."
1130 PRINT
1135 PRINT "5. IN ORDER TO ACHIEVE THIS OBJECTIVE,"
1140 PRINT "YOU SHOULD FORGET THAT I AM A MACHINE."
1145 PRINT
1150 PRINT "6. I'M NOT GUARANTEING CONTENT"n
1155 PRINT "OR EVEN THE TRUTH, BUT I'LL DO"
1160 PRINT "THE BEST I CAN."
1165 PRINT
1170 PRINT "(PRESS "RETURN" TO CONTINUE.)"
1175 INPUT
21110 PRINT
21120 PRINT
21130 PRINT
21140 PRINT "COMMAND", "TYPE IN---", "I'LL DO THIS---"
21150 PRINT "----------------", "----------------"
21160 PRINT
21170 PRINT "STOP!", "I'LL STOP ASKING QUESTIONS AND CLOSE."
21180 PRINT
21190 PRINT "CONTINUE!", "I'LL SKIP AHEAD TO THE NEXT QUESTION."
21200 PRINT
21210 PRINT "REPEAT!", "I'LL REPEAT THE QUESTION."
21220 PRINT
21230 PRINT "DIRECTIONS!", "I'LL SHOW YOU THESE DIRECTIONS."
21240 PRINT
21250 PRINT "CHANGE!", "I'LL LET YOU CHANGE YOUR SUBJECT."
21260 PRINT
21270 PRINT "", "I'LL LET YOU ASK A QUESTION."
21280 PRINT
21290 PRINT "EXPLAIN!", "I'LL EXPLAIN THE QUESTION."
21300 PRINT
21310 PRINT "SCENE!", "I'LL ASK YOU A "SCENE" QUESTION."
21320 PRINT
21330 PRINT "ALSO, I'LL LET YOU ASK FOR "ACT"."
21340 PRINT "AGENT", "AGENCY", AND "PURPOSE","
21350 PRINT
21360 PRINT "ASK!", "I'LL LET YOU CONTINUE WITH YOUR RESPONSE."
21370 PRINT
21380 PRINT "(PRESS "RETURN" TO CONTINUE)"
21390 INPUT A$  
21400 PRINT
21410 PRINT
21420 PRINT
21430 PRINT  
21440 PRINT "THE LAST THINGS!"
21450 PRINT
21460 PRINT "1. THINK OF ME AS A PERSON WHO CAN ASK A LOT OF GOOD"
21470 PRINT "QUESTIONS."
21480 PRINT
21490 PRINT "2. SCREAM FOR HELP IF I START ACTING REALLY CRAZY!"
21500 PRINT
21510 PRINT
21520 PRINT
21530 PRINT
21540 PRINT
21550 PRINT
21560 PRINT
21570 PRINT
21580 PRINT
21590 IF A$ THEN 1613
21600 GOTO 1790
21610 PRINT "BACK TO THE QUESTIONS. "HIS" --- --- ---"
21620 PRINT
21630 PRINT
21640 PRINT
21650 PRINT "BUT FIRST, IS THERE"
21660 GOTO 1413
21670 PRINT
21680 PRINT
21690 PRINT
PRINT "WOULD YOU LIKE TO REVIEW KENNETH BURKE'S PENTAD?"
PRINT "(YES OR NO)"
IF YES THEN 1766
GOTO 2500
REM "<<< PENTAD DESCRIPTION >>>"
PRINT "BRIEFLY, KENNETH BURKE'S DRAMATISTIC PENTAD"
PRINT "ENCOURAGES A WRITER TO THINK ABOUT A SUBJECT FROM FIVE" "PERSPECTIVES."
PRINT "SCENE", "WHERE AND WHEN SOMETHING HAPPENS."
PRINT "ACT", "WHAT HAPPENS."
PRINT "AGENT", "WHO CAUSES WHAT HAPPENS TO HAPPEN."
PRINT "AGENCY", "BY WHAT MEANS DOES SOMETHING HAPPEN."
PRINT "PURPOSE", "WHY SOMETHING HAPPENS."
PRINT "BURKE ALSO ENCOURAGES WRITERS TO SEE THE RELATIONSHIPS" "AMONG THESE PERSPECTIVES, HE CALLS THESE RELATIONSHIPS."
PRINT "THE RATIOS."
REM "<<< SUBJECT SEQUENCE >>>"
INPUT AS
REM "(HIT "RETURN" TO CONTINUE)"
PRINT LPRINT AS
PRINT "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."
PRINT LPRINT AS
PRINT "YES?"
PRINT LPRINT AS
IF YES THEN 2200
IF EM(X)18 THEN 2200
REM "THAT'S A MOUTHFUL, "YES", MAKE IT SHORTER--LIKE A TITLE."
"HERE ARE A FEW EXAMPLES:"
217

2248 PRINT
2250 PRINT
2252 PRINT, "HUMAN RIGHTS"
2254 PRINT, "INFLATION"
2256 PRINT, "GLASS BLOWING IN MEXICO"
2258 PRINT
2260 PRINT
2262 PRINT, "YOUR TURN. WHAT IS YOUR SUBJECT?"
2264 PRINT
2266 PRINT
2268 GOTO 2288
2270 IF 94 THEN 2420
2272 GOTO 2210
2274 PRINT
2276 PRINT, "YOUR REVISED SUBJECT IS " "SS.""
2278 PRINT
2280 PRINT
2282 PRINT
2284 PRINT
2286 PRINT
2288 GOTO 4096
2290 PRINT, "INFORMAL ACKNOWLEDGMENT OF SUBJECT"
2292 PRINT, "REALITY: WHAT A COINCIDENCE---I ONCE READ A"
2294 PRINT, "BOOK ABOUT "SS."
2296 GOTO 4096
2300 PRINT
2302 PRINT, "HEY, THAT'S NEAT, "NICE! WE'LL ENJOY EXPLORING"
2304 PRINT
2306 PRINT
2308 GOTO 4096
2310 PRINT
2312 PRINT, "BE SURE TO ASK THE REFERENCE LIBRARIAN ABOUT THE RECENT"
2314 PRINT, "RESEARCH ON "SS". YOU'LL BE"
2316 PRINT, "WELL-REGARDED."
2318 PRINT
2320 PRINT, "(Hit "RETURN" TO CONTINUE.)"
2322 INPUT 43
2324 LET 44 = "PURPOSE SEQUENCE"
2326 PRINT
2328 PRINT
2330 PRINT
2332 PRINT
2334 PRINT, "A COMMENT ABOUT YOUR PURPOSE!"
2336 PRINT
2338 PRINT
2340 PRINT
2342 PRINT
2344 PRINT, "DURING THIS EXPLORATION PROCESS,"
2346 PRINT, "YOU WILL BE ASKED TO CLARIFY THE PURPOSE OF"
2348 PRINT, "YOUR PAPER IN "SS."
2350 PRINT
2352 PRINT
2354 PRINT, "SO NOW WOULD YOU BRIEFLY DESCRIBE THE PURPOSE"
2356 PRINT, "OF YOUR PAPER BY COMPLETING THIS STATEMENT"
2358 PRINT
2360 PRINT, "THE PURPOSE OF MY PAPER IS " "..."
2362 PRINT, "(ONE LINE LIMIT, PLEASE!"
2364 PRINT
218

PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
INPUT #9
IF #9# THEN 2930
2940
PRINT
2950
SUB 3981
2960
PRINT
2970
PRINT, "FINE, "915", YOU AND I WILL TALK AGAIN ABOUT YOUR"
2980
PRINT, "PURPOSE."
2990
PRINT
3000
PRINT
3010
GOTO 3990
3020
PRINT "PURPOSE SEQUENCE AT C#100"
3030
PRINT
3040
PRINT, "BEFORE WE CONTINUE, "915", 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 "YOU "915","
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, . . . ."
3140
PRINT, "(LIMIT ONE LINE)"
3150
PRINT
3160
PRINT
3170
INPUT #13
3180
IF #13# THEN 3190
3190
PRINT
3200
GOSUB 3981
3210
PRINT "OKAY, GOOD, KEEP PURPOSE IN MIND AS WE CONTINUE."
3220
IF #9# THEN 3220
3230
IF #9# THEN 3220
3240
IF #9# THEN 3220
3250
IF #9# THEN 3220
3260
PRINT
3270
PRINT
3280
PRINT, "HERE IS YOUR NEXT QUESTION -- NUMBER "915","
3290
PRINT
3300
IF #9# THEN 3220
3310
IF #9# THEN 3220
3320
IF #9# THEN 3220
3330
IF #9# THEN 3220
3340
IF #9# THEN 3220
3350
GOTO 3981
3360
PRINT "PURPOSE SEQUENCE AT C#100"
3370
IF #9# THEN 3220
3380
PRINT
3390
PRINT, "LET'S PAUSE ONCE AGAIN TO CONSIDER YOUR INTENT."
3400
PRINT
3410
PRINT, "YOUR GENERAL PURPOSE IS "9"
3420
PRINT "BI","
3430
PRINT
3440
PRINT, "ALSO, YOU WANT YOUR READER TO UNDERSTAND"
PRINT P18,"
PRINT "IS THERE ANYTHING ELSE YOU WISH TO SAY ABOUT YOUR PURPOSE?"
PRINT "{YES OR NO?}"  
GOSUB 6590
IF K=1 THEN 3530
PRINT
PRINT,"FINE, ""#15", ENOUGH ABOUT YOUR PURPOSE,"  
GOTO 3260
PRINT
PRINT,"GREAT, ""#15", WHAT WOULD YOU LIKE TO ADD?"
PRINT,"(ONE LINE LIMIT IN EFFECT)"
PRINT
INPUT P28
IF #28" THEN 3560
GOSUB 3561
GOTO 3160
PRINT
PRINT,"ANY MORE?"
PRINT,"(IF SO, TYPE WHATEVER IT IS; IF NOT, TYPE "NO",.)"
PRINT
PRINT
PRINT "FAVOR QUESTION SEQUENCE
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT "RELAX NOW, ""#15", AND ENJOY THIS EXPLORATION OF:"  
PRINT #17 P18,"
PRINT #17 P28
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT
PRINT "COUNTER/EXPLORATION CONTROLS >>"
220

```
20300 AREAD=1
20310 GOTO 4060
20340 GOTO 4060
20400 IF C#1 THEN 40600
20500 IF C#2 THEN 43400
20600 IF C#3 THEN 41900
20700 IF C#4 THEN 41800
20800 IF C#5 THEN 47000
20900 IF C#6 THEN 46800
21000 IF C#7 THEN 45900
21100 IF C#8 THEN 43600
21200 IF C#9 THEN 43700
21300 IF C#0 THEN 40700
21400 STOP
```

IF C69 THEN 3620
34790 IF C6A THEN 3348
34790 IF C33 THEN 3264
34790 IF C6A THEN 4668
34790 IF Z(2) THEN 4688
34790 Z(2)=1
34790 GOTO 4126
34790 PRINT "HERE IS QUESTION* FROM THE "AGENT" PERSPECTIVE!"
34790 PRINT
34790 GOTO 4126
34790 PRINT "REMEMBERS AGENCY REQUEST IF ROUTED"
34790 CC=1
34790 IF C6A THEN 3620
34790 IF C6A THEN 3348
34790 IF C33 THEN 3264
34790 IF C6A THEN 4668
34790 IF Z(2) THEN 4688
34790 Z(2)=1
34790 GOTO 4126
34790 PRINT "HERE IS QUESTION* FROM THE "PURPOSE" PERSPECTIVE!"
34790 PRINT
34790 GOTO 4140
34790 PRINT "PARTICULAR POOL EXHAUSTED"
34790 PRINT "SORRY, "VIAH", NO MORE QUESTIONS LEFT HERE. WHAT NOW?"
34790 PRINT "WHAT IS THE SETTING FOR "SIA"?"
34790 PRINT "WHAT IS THE BACKGROUND FOR "SIA"?"
PRINT "WHAT PARTICULARS OF THE SETTING INFLUENCE"
PRINT "... DESCRIBE..."
GOTO 6750
PRINT "IS THE SETTING AROUND "S" UNIQUE?"
PRINT "WHAT MAKES IT SO?"
GOTO 6750
PRINT "DOES THE SETTING FOR "S" REMIND YOU""...
PRINT "OF SOMETHING IN YOUR OWN EXPERIENCE? WHY OR WHY NOT?"
GOTO 6750
PRINT "IS THE SETTING OF "S" GOOD, BAD, ..."
PRINT "OR INDIFFERENT? EXPLAIN."
GOTO 6750
PRINT "ARE SOME IMPORTANT ASPECTS OF THE SETTING OF "S" IGNORED BY PEOPLE? WHY OR WHY NOT?"
GOTO 6750
PRINT "WHAT WOULD BE THE IDEAL SETTING FOR "S"?"
PRINT "DESCRIBE..."
PRINT "WHAT IMPRESSES PEOPLE ABOUT THE SETTING FOR "S"?"
PRINT "DESCRIBE..."
PRINT "WHAT HAPPENS IN "S"? DESCRIBE..."
GOTO 6750
PRINT "WHAT CAUSES "S"? EXPLAIN..."
PRINT "DESCRIBE OR LIST WHAT OTHERS MAY NOT KNOW."
PRINT "ABOUT "S"."
PRINT "ACT QUESTIONS >>>
PRINT "HOW IS "S" LIKE A RAINBOW, "UNIQUE"?"
GOTO 6750
PRINT "WHAT ARE THE CONSEQUENCES OF "S"?"
GOTO 6750
PRINT "WHAT AUTHORITIES KNOW ABOUT "S"?"
PRINT "ARE THEY RELIABLE?"
GOTO 6750
PRINT "HOW SHOULD PEOPLE BEHAVE OR ACT TODAY REGARDING "S"?
PRINT "S"...
PRINT "WHAT"; GOTO 6750
PRINT "DESCRIPTION OF THE INHERENT CRISIS IN "S"?
PRINT "IN OTHER WORDS, WHAT IS THE MAIN PROBLEM?"
GOTO 6750
PRINT "DESCRIPTION HOW "S" IS A CUSTOM OR..."
PRINT "A HABIT OF THINKING."
GOTO 6750
PRINT "AGENT QUESTIONS >>>
PRINT "WHO IS INVOLVED WITH "S"?"
PRINT "HOW INVOLVED? EXPLAIN..."
GOTO 6750
PRINT "HOW ARE PEOPLE CONSCIOUSLY OR UNCONSCIOUSLY INVOLVED..."
PRINT "WITH "S"?"
GOTO 6750
PRINT "DESCRIPTION THE FEELINGS OF THOSE PEOPLE WHO ARE INVOLVED..."
PRINT "WITH "S", WHAT..."
PRINT "SENSIBILITIES DO THEY SHARE?"
GOTO 4758
25719 PRINT "WHAT AUDIENCE WOULD MOST APPRECIATE KNOWING MORE?"
25727 PRINT "ABOUT "53?"
25734 GOTO 4759
25742 PRINT "WHO ESPECIALLY THINKS ABOUT "53?"
25749 PRINT "WHY? EXPLAIN.
25756 Z(25)=1
25763 GOTO 4759
25770 PRINT "WHO ESPECIALLY CARES ABOUT "53?"
25777 PRINT "EXPLAIN THEIR REASONS."
25784 Z(25)=1
25791 GOTO 4759
25802 PRINT "ARE THE PEOPLE INVOLVED WITH "53"
25809 PRINT "FOR CHANGE OR NOT? EXPLAIN."
25816 GOTO 4759
25823 PRINT "WHAT ATTITUDES DO PEOPLE HAVE TOWARD"
25830 PRINT "53? EXPLAIN."
25837 GOTO 4759
25844 PRINT "DO THE PEOPLE INVOLVED WITH "53"
25851 PRINT "AGREE? EXPLAIN ANY SIGNIFICANT DIFFERENCES."
25858 GOTO 4759
25865 PRINT "MAKE A SHORT LIST OF POINTS OF VIEW ABOUT"
25872 PRINT "53?, PRO? CON? INDIFFERENT? IGNORANT?"
25879 GOTO 4759
25886 PRINT "AGENCY QUESTIONS >>
25893 PRINT "DESCRIBE THE PROCESSES USED IN "53?",
25899 PRINT "YOU MAY WANT ME TO EXPLAIN IF SO. TYPE "EXPLAIN;"
25906 PRINT "REMEMBER THE EXCLAMATION POINT!!"
25913 GOTO 4759
25920 PRINT "COMPLETE! IF THE ENDS OF "53"
25927 PRINT "ARE THE MEANS ARE ________
25934 GOTO 4759
25941 PRINT "HOW IS "53? LIKE MERCURY"
25948 PRINT "IN A THERMOMETER? EXPLAIN."
25955 GOTO 4759
25962 PRINT "WHAT PROPS OR DEVICES ARE USED IN"
25969 PRINT "53? DESCRIBE."
25976 GOTO 4759
25983 PRINT "WHAT PSYCHOLOGICAL OR "HISTORICAL CAUSES HELP"
25990 PRINT "CREATE "53? HOW?"
26007 GOTO 4759
26014 PRINT "WHAT ECONOMIC OR POLITICAL CAUSES HELP CREATE"
26021 PRINT "53? DESCRIBE."
26028 GOTO 4759
26035 PRINT "WHAT CULTURAL OR SOCIOLOGICAL CAUSES HELP"
26042 PRINT "CREATE "53? ELABORATE."
26049 Z(33)=1
26056 GOTO 4759
26063 PRINT "WHAT CAN EDUCATION BE AN IMPORTANT TOOL IN"
26070 PRINT "53? EXPLAIN."
26077 Z(33)=1
26084 GOTO 4759
26091 PRINT "HOW DOES MONEY AFFECT "53?"
26108 GOTO 4759
26115 PRINT "WHAT TOOLS, WEAPONS, INSTRUMENTS DO YOU NEED TO CHANGE"
26122 PRINT "ATTITUDES ABOUT "53? DESCRIBE."
26129 GOTO 4759
26136 PRINT "PURPOSE QUESTIONS >>
26143 PRINT "WHAT PURPOSES DOES "53? HAVE?"
THE ULTIMATE GOAL OF "SS" IS TO DESCRIBE.

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

WHAT ARE THE PURPOSES OF "SS" BEEN?

WHAT PREDICTIONS CAN YOU MAKE ABOUT "SS"?

WHAT ARE THE PURPOSES OF "SS" PART?

WHAT ARE THE PURPOSES OF "SS" LARGER PURPOSE? DESCRIBE THIS LARGER PURPOSE.

WHAT REASONS CAN YOU LIST FOR THE EXISTENCE OF "SS"?

WHAT SOLUTIONS COULD YOU RECOMMEND FOR ANY PROBLEMS CAUSED BY "SS"?

LARGER PURPOSE?

REMARKS & SEMANTIC STABS FOR BRANCHING

"CONTINUE"
22570 IF #1 THEN 9228
22580 JS*"NOTIFICATIONS"
22590 GOSUB 6640
22600 OM1
22610 22620 IF #1 THEN 6640
22630 JS*"END"76
22640 GOSUB 6680
22650 IF #1 THEN 8640
22660 JS*"NAME?76
22670 GOSUB 6640
22680 IF #1 THEN 6758
22690 JS*"NAME?76
22700 GOSUB 6680
22710 IF #1 THEN 6590
22720 JS*"EXPLAIN?"*
22730 GOSUB 6640
22740 IF #1 THEN 9360
22750 JS*"DONT =UNDE\RT?"*
22760 GOSUB 6680
22770 IF #1 THEN 9360
22780 JS*"DON'T =NOW?"*
22790 GOSUB 6600
22800 IF #1 THEN 9360
22810 JS*"CHANGE?"*
22820 GOSUB 6600
22830 IF #1 THEN 6790
22840 JS*"NAME?76
22850 GOSUB 6680
22860 IF #1 THEN 9360
22870 JS*"NAME?76
22880 GOSUB 6680
22890 IF #1 THEN 9360
22900 JS*"OR =?76
22910 GOSUB 6800
22920 IF #1 THEN 6680
22930 JS*"CAN I =?76
22940 GOSUB 6680
22950 IF #1 THEN 6920
22960 JS*"IT =?76
22970 GOSUB 6680
22980 IF #1 THEN 6920
22990 JS*"BECAUSE?"*
23000 GOSUB 6680
23010 IF #1 THEN 6960
23020 JS*"SCENE?"*
23030 GOSUB 6680
23040 IF #1 THEN 6790
23050 JS*"ACT?"*
23060 GOSUB 6680
23070 IF #1 THEN 6790
23080 JS*"AGENT?"*
23090 GOSUB 6680
23100 IF #1 THEN 6790
23110 JS*"AGENT?"*
23120 GOSUB 6680
23130 IF #1 THEN 6790
23140 JS*"PURPOSE?"*
23150 GOSUB 6600
23160 IF #1 THEN 4760
REM " *** EXPLORATION BRANCHING AND FEEDBACK ***"

37460 PRINT
37470 PRINT
37480 IF Exp THEN 7790
37490 ON F1 GOTO 7710, 7720, 7730, 7740, 7750, 7760
37510 PRINT "GOOD, "NIS", ADD TO YOUR RESPONSE NOW."
37520 GOTO 7760
37530 PRINT "FINE, "NIS", WRITE SOME MORE."
37540 GOTO 7760
37550 PRINT "THAT'S THE IDEA, "NIS", GIVE ME SOME MORE INFO NOW."
37560 GOTO 7760
37570 PRINT "BETH GEORGE, "NIS", GOOD ONE, WRITE A LITTLE MORE PLEASE."
37580 GOTO 7760
37590 ON F2 GOTO 7790, 7820, 7840, 7860, 7880
37600 PRINT "SUPER, "NIS"!
37610 GOTO 7790
37620 PRINT "OUTSTANDING, "NIS"!
37630 GOTO 7790
37640 PRINT "FANTASTIC, "NIS"!
37650 GOTO 7790
37660 PRINT "TERRIFIC, "NIS"!
37670 GOTO 7790
37680 PRINT "GREAT, "NIS"!
37690 PRINT
37700 E3=E3+1; 'E3+COUNTER FOR EXPLORED QUESTIONS
37710 PRINT "ANYTHING ELSE?"
37720 IF E3>2 THEN 7970
37730 PRINT "(YOU CAN ADD MORE INFO, ASK A"
37740 PRINT "QUESTION, OR GIVE A COMMAND ---"
37750 PRINT "WHATEVER YOU "NIS",;"
37760 PRINT
37770 J5=J5+1
37780 GOTO 9590
37790 IF K=1 THEN 4850
26030 GOTO 7610
26030 GOTO 7610
26030 PRINT "OKAY."
26031 *PREVENTS REPEATED PURPOSE SETS, AFTER HELP
IC CHOICE
26070 PRINT
26075 IF C=13 THEN 9140
26080 IF C=16 THEN 9140
26085 IF C=17 THEN 3920
26090 IF C=18 THEN 3340
26095 PRINT
26100 PRINT
26105 /*PRINT(18= AND 41)*/
26110 ON 80GOTO 8139,8159,8179,8199,8219,8239,8259,8279,8299,8319
26120 PRINT "(USE GOOD, STRONG, ACTION VERBS WHEN YOU CAN,)
26125 GOTO 8320
26130 PRINT "(I'LL EXPLAIN A QUESTION IF YOU TYPE "EXPLAIN,""
26135 GOTO 8320
26140 PRINT "(THE MORE SENTENCES YOU USE THE BETTER SESSION WE'LL HAVE"
26145 GOTO 8320
26150 PRINT "(IF YOU DON'T UNDERSTAND A QUESTION, JUST SAY SO, I'LL"
26155 GOTO 8320
26160 PRINT "AFTER THE NEXT QUESTION, TYPE "WHAT?" AND I'LL DO MY THING"
26165 GOTO 8320
26170 PRINT "(REASONS ARE IMPORTANT, TOO -- THE MORE, THE BETTER,")"
26175 GOTO 8320
26180 PRINT "(HEY, I'M ENJOYING THIS, YOU'RE QUITE BRIGHT!")"
26185 GOTO 8320
26190 PRINT "(REMEMBER COMMANDS NEED EXCLAMATION MARKS!! LIKE "REPEAT"
26195 "...")"
26200 GOTO 8320
26210 PRINT "(I'LL TRY TO ANSWER YOUR QUESTIONS. DON'T FORGET,!
26215 GOTO 8320
26220 PRINT
26225 GOTO 8320
26230 PRINT "AND HERE COMES A REALLY INTERESTING QUESTION--NUMBER "C+1"
26235 GOTO 8470
26240 PRINT "WHERE IS QUESTION "C+1", ONE OF MY ALL-TIME FAVORITES COMING UP,"
26245 GOTO 8470
26250 PRINT "HERE IS QUESTION "C+1", "13",""
26255 GOTO 8470
26260 PRINT "LET'S SEE, HOW ABOUT QUESTION "C+1" NEXT. HERE YOU ARE,"
26265 GOTO 8470
26270 PRINT
26275 GOTO 8320
26280 PRINT "RESPONS TO ISING, AFTER INVENTION PROMPTER"
26285 PRINT "YOU COULD TELL ME "WHY NOT", BUT YOU"
26290 PRINT "MAY JUST ASK TO CONTINUE, IF SO, TYPE "CONTINUE:""
26295 PRINT "(DON'T FORGET THE EXCLAMATION POINT;)
26300 GOTO 8470
26305 PRINT "RESPONSE TO "GARBAGE" OR JARGON"
26310 PRINT "HEY, "13", WHAT LANGUAGE: 111111"
PRINT "TRY IT AGAIN, I CANNOT UNDERSTAND WHAT YOU'RE SAYING."
PRINT
PRINT "YOU MAY HAVE RUN SOME WORDS TOGETHER. IF SO,"
PRINT "JUST CONTINUE EXPLORING, I'LL REPEAT THIS"
PRINT "QUESTION IF YOU THINK I REPEATED I'LL GO ON IF YOU"
PRINT "TYPE ['CONTINUE'] IF YOU HAVE MORE TO WRITE HERE, OK?"
PRINT "AHEAD.")"
GOTO 6768
PRINT "ANSWERS THE COMMAND #549"
PRINT "GO ON, "NIS"."
GOTO 6768
GOTO 6768
PRINT "ANSWERS THE SINGLE QUESTION MARK (IS.""
PRINT "G0 AHEAD, "NIS", ASK, I'LL DO THE BEST I CAN,"
PRINT "ANSWERS A "YES" TO ANYTHING ELSE?"
PRINT "WHAT?"
GOTO 6768
PRINT "ANSWERS THE QUESTION MARK?"
PRINT "I COULD SAY THAT THAT'S FOR ME TO KNOW AND FOR YOU TO FIND OUT,"
PRINT "SERIOUSLY, I CANNOT PRETEND TO KNOW "HOW", BUT YOU"
PRINT "SHOULD KEEP EXPLORING FOR AN ANSWER,"
GOTO 6768
PRINT "ANSWERS THE QUESTION MARK?"
PRINT "WELL, ANY NOT? REMEMBER WE ARE EXPLORING, BRAINSTORMING!"
PRINT 6768
GOTO 6768
PRINT "ANSWERS CHANGE #549 COMMAND"
PRINT 6768
PRINT "PLEASE TYPE IN YOUR NEW SUBJECT!"
PRINT 6768
PRINT "ANSWERS STATEMENT # OR #?"
PRINT "WHATEVER YOU THINK BEST, "NIS", YOU DECIDE,"
GOTO 6768
GOTO 6768
PRINT "ANSWERS QUESTION # CAN I #?"
PRINT "YES, OF COURSE."
PRINT 6768
GOTO 6768
PRINT "RESPOND TO SUBORDINATE # BECAUSE#"
PRINT "I LIKE YOUR REASONING."
GOTO 6768
PRINT "RESPOND TO #?"
PRINT 6768
PRINT "ANOTHER INTERESTING QUESTION, I'D SAY "YES."
PRINT 6768
GOTO 12992
PRINT "YES, THAT SEEMS OKAY."
229

PRINT
GOTO 6294
PRINT "RESPONDS TO SHORT ANSWERS"
PRINT "ANNIE, SHORT AND SWEET, DON'T TELL ME"
PRINT "ANNY IN OTHER WORDS, ELABORATE A LITTLE."
GOTO 6230
PRINT
GOTO 6748
PRINT "DO YOU WISH TO CHANGE OR NARROW YOUR SUBJECT?"
PRINT "YES OR NO?"
GOTO 9484
GOTO 6794
PRINT
GOTO 9346
PRINT "RESPONDS TO "REPEAT""
IF 3'4 then 9273
IF 5'4 then 4959
REPRINT SELECTED SCENE QUESTION
IF C'4 then 1999
REPRINT ONE OF FIRST RANDOM FIVE QUESTIONS
GOTO 4996
REPRINT RANDOM SCENE QUESTION
IF 4'1 then 9446
IF 5'1 then 9476
IF 6'1 then 9486
IF 7'1 then 9496
IF 8'1 then 9506
IF 9'1 then 9516
IF 9'2 then 9526
IF 9'3 then 9536
IF 9'4 then 9546
IF 9'5 then 9556
IF 9'6 then 9566
IF 9'7 then 9576
IF 9'8 then 9586
IF 9'9 then 9596
IF 0'1 then 9616
IF 0'2 then 9626
IF 0'3 then 9636
GOTO 9646
PRINT "CLASSIFICATION ARRAY AND EXAMPLE SEQUENCE >>
PRINT
IF I'1 then 12413
19586 I(N)1
19596 IF C'5 then 9590
19606 IF 3'1 then 9590
19616 IF 4'1 then 9610
19626 IF 5'1 then 9620
19636 IF 6'1 then 9630
19646 IF 7'1 then 9640
19656 IF 8'1 then 9650
19666 IF 9'1 then 9660
19676 IF 0'1 then 9670
19686 IF 1'1 then 9680
19696 IF 2'1 then 9690
19706 IF 3'1 then 9700
19716 IF 4'1 then 9710
19726 IF 5'1 then 9720
19736 IF 6'1 then 9730
19746 IF 7'1 then 9740
19756 IF 8'1 then 9750
19766 IF 9'1 then 9760
GOTO 9776
PRINT
GO TO 9468
19776 R(N1)A
19786 GOTO 9496
19796 R(N1)-B
19806 GOTO 9496
19816 R(N1)-C
19826 GOTO 9496
19836 ON R1: GOTO 9446,9546,9756,9886,9886,9916,9943,9986,13624,13876,13116
19846 ON R2: GOTO 10116,10146,10236,10336,13316,13416,19448,19516,19376,14420
19856 ON R3: GOTO 13716,13876,13886,19889,19926,11116,11116,11166,11230
"In writing a paper, it is not always easy to find an interesting topic, so you might consider writing about something that is surprising about "50", or if you are writing a paper about UFOs, you might want to write something about the UFO experience. If you are writing a paper about a controversial topic, such as abortion, you might want to write something about the varied viewpoints of people. Analogies are often fruitful ways to think about a topic. For example, a rainbow can be a symbol of hope, a short-lived phenomenon.

By 'society's attitude' I mean what do people in general think about "50". An important consideration when writing about the actions of a subject is clearly recognizing the consequences of such actions. In other words, what happens after or as a result of "50"?

If there are two parts to this question, first, and are the experts (so-called) trustworthy?

If yes, then.

This is the kind of information that can be discovered during the research phase. Keep this question in mind.

Often a subject can or should affect human behavior. This is a question asks what should we do, should he fight?

Should we change? Should we be quiet about it? Should we? The same steps to understand?

Another way to say 'inherent crisis' is 'basic problem'.

General dilemma, you can begin by discovering the "50" or more parts of "50" which.

Create the problem, this answer is important.

Print "you to explore those matters which tend to keep".
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18710 PRINT "BASICALLY, "I WANT YOU TO WRITE A FEW WORDS ABOUT THEIR INTEREST."
18720 GOTO 12588
18730 PRINT "THIS IS AN INTERESTING QUESTION SINCE "ANY PEOPLE CAN"
18740 PRINT "BE UNAWARE OF HOW "SE" AFFECTS"
18750 PRINT "US," MAYBE ANOTHER "TO PHRASE THIS QUESTION "WOULD"
18760 PRINT "BE: ARE PEOPLE ACTIVELY OR PASSIVELY INVOLVED IN" 18770 PRINT "SS?"
18780 GOTO 12588
18790 PRINT "HOW DO PEOPLE FEEL ABOUT "SS?"
18800 PRINT "DISTRESSED? HURT? HAPPY? "HEART STRONG? "INDIFFERENT?"
18810 PRINT "ANOTHER "AMAZED? "FRIGHTENED? "ENCOURAGED? ETC."
18820 GOTO 12588
18830 PRINT "WHAT GROUP OF PEOPLE ARE "MOST LIKELY TO READ ABOUT"
18840 PRINT "SS" IN A NEWSPAPER?"
18850 PRINT "HERE'S ANOTHER "WAY TO "LOOK AT IT; IF YOU "HERE NOT"
18860 PRINT "WRITE THIS PAPER FOR CLASS, WHO "WOULD YOU"
18870 PRINT "BE "WRITE IT FOR? "NO ONE "DOES NOT COUNT!")"
18880 GOTO 12588
18890 PRINT "WHO ARE THE THINKERS? "WHY ARE THEY "THINKING ABOUT"
18900 PRINT "SS? ARE THEY?"
18910 PRINT "TAKING "ACTION? EXPLAIN "ANY OR "ANY NOT."
18920 PRINT "FOR EXAMPLE, IF I "HERE "WRITE ABOUT THE DISCOTHEQUE"
18930 PRINT "FAD, I "MIGHT WANT TO "EXPLAIN WHAT "THOSE IN THE"
18940 PRINT "DISCOTHEQUE "BUSINESS THINK "ABOUT THE "REVENUE."
18950 X(25)=1
18960 GOTO 12588
18970 PRINT "THIS IS "THE "FAMILIAR "WHO CARES" QUESTION. BUT "HERE THE"
18980 PRINT "ANSWER "HAS TO "BE "SOMEONE, IF "YOU "CAN, "EXPLAIN WHY"
18990 PRINT "THESE "PEOPLE "ARE, "WHAT "IS "AT "STAKE "FOR THEM?"
19000 PRINT "FOR "EXAMPLE, IF I "HERE "WRITE ABOUT "ENERGY "RESOURCES."
19010 PRINT "I "WOULD "SAY THAT "THE "PRESIDENT "CARES "BECAUSE "AMERICA'S"
19020 PRINT "NATURAL "RESOURCES "ARE "DIMINISHING, ETC, "I "MIGHT "WANT"
19030 PRINT "TO "FOLLOW "THIS "MATTER UP "BY "READING HIS "ENERGY "PROPOSALS."
19040 X(26)=1
19050 GOTO 12588
19060 PRINT "TO "CHANGE OR "NOT TO "CHANGE, THAT "IS "THE "QUESTION."
19070 GOTO 12588
19080 PRINT "DESCRIBE "THE "PEOPLE "AND "THEIR "RELATIVE "POSITIONS "RELATING"
19090 PRINT "CHANGE AND "SS?"
19100 GOTO 12588
19110 PRINT "NOT "ALL "PEOPLE "SHARE "THE "SAME "OPINIONS "ABOUT"
19120 PRINT "SS?, "MENTION "THE "DIFFERENCES"
19130 PRINT "SHADES "OF "DIFFERENCES "WITH "REGARD "TO "ATTITUDE."
19140 GOTO 12588
19150 PRINT "THIS "QUESTION "HAS "MORE "TO "DO "WITH "THE "FACTS "SURROUNDING"
19160 PRINT "SS? " THAN "THE "ATTITUDES."
19170 PRINT "ARE "THE "FACTS "OF "THE "MATTER "AGREE "UPON."
19180 PRINT "AMONG "ALL "PARTIES?"
19190 GOTO 12588
19200 PRINT "A "GOOD "ANSWER "TO "THIS "QUESTION "CAN "TRULY "HELP "YOU "ORGANI"
19210 PRINT "WRITE "YOUR "PAPER, "TRY "TO "BALANCE "THE "LIST "BY "MENTIONING"
19220 PRINT "THE "OPPOSITE "PERSPECTIVE "AS "WELL, "INCIDE."
PRINT "A PERSON'S NAME WITH EACH POINT OF VIEW IF YOU CAN."
11240 GOTO 12580
11250 PRINT "PROCESSES IS A CURIOUS WAY TO PUT IT. I SUPPOSE."
11313 PRINT "I WOULD LIKE YOU TO DESCRIBE HOW YOUR SUBJECT."
11320 PRINT "3", WORKS, WHAT INSTRUMENTS."
11329 GOTO 12590
11330 PRINT "TOOLS, OR METHODS COME TO MIND?"
11340 PRINT "YOU HAVE TO THINK ABOUT TWO THINGS HERE: THE FINAL"
11350 PRINT "PRODUCT OF "3" AND HOW"
11360 PRINT "THIS PRODUCT CAME ABOUT, THINK ABOUT IT, "H15","
11370 GOTO 12560
11380 PRINT "THIS ANALOGY IS ONE OF MANY I COULD HAVE ASKED YOU."
11390 PRINT "ONE WAY TO LOOK AT IT WOULD BE TO DESCRIBE HOW"
11400 PRINT "5" REACTS TO AN".
11410 PRINT "MEASURES ITS SURROUNDINGS, YOU CAN PROBABLY THINK"
11420 PRINT "OF ANOTHER INTERPRETATION AS WELL."
11430 PRINT "UNDERSTANDING THE WORKINGS OF "3"
11440 PRINT "WILL HELP YOU WRITE, BY "PROPS" I"
11450 PRINT "MEAN INSTRUMENTS ASSOCIATED WITH YOUR SUBJECT. I SUSPECT"
11460 PRINT "THIS SAME DEFINITION HOLDS FOR "DEVICES."
11470 GOTO 12500
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"
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 "3."
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 "H1B", I WANT YOU TO SEE"
11680 PRINT "BE 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 "5", BY "SOCIOLOGICAL" I MEAN"
11720 PRINT "THOSE SPECIFIC NEEDS OF A PARTICULAR GROUP OF PEOPLE."
11730 PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT SPACE EXPLORATION."
11740 PRINT "I WOULD ADDRESS THE NEED FOR MAN TO EXPLORE AND DISCOVER,"
11750 PRINT "I MIGHT CONSIDER HOW SPACE IS OUR MODERN FRONTIER."
11760 GOTO 12510
11770 PRINT "WHAT DO WE NEED TO LEARN ABOUT "3?"
11780 PRINT "HOW ARE WE GOING TO BE TAUGHT? WHO IS GOING TO "TEACH US?"
11790 PRINT
11800 PRINT
PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT INFLATION, I WOULD"
PRINT "WRITE THAT WE NEED TO LEARN HOW DANGEROUS"
PRINT "INFLATION COULD BE. I WOULD ADD THAT WE ARE NOT LEARNING"
PRINT "RAPIDLY, AND CONSEQUENTLY ONLY A SEVERE RECESSION WILL"
PRINT "TEACH US ANYTHING IMPORTANT. FINALLY, I WOULD LOCATE"
PRINT "SOME MORE SPECIFIC INFORMATION AT THE LIBRARY."
GOTO 2598

I1690 PRINT "IS MONEY THE ROOT OF ALL EVIL OR THE ONLY HOPE FOR"
I1700 PRINT "$1,998.89."
I1710 PRINT "HOW WOULD IT AFFECT THE SITUATION? FOR BETTER OR"
I1720 PRINT "WORSE?"
I1730 GOTO 12598
I1740 PRINT "ONE OF THE MAJOR "AGENCY" CONCERNS IS TO STATE"
I1750 PRINT "AND DESCRIBE WHATEVER DEVICE/METHOD WILL SIGNIFICANTLY"
I1760 PRINT "CHANGE A PERSON'S ATTITUDE ABOUT A SUBJECT. OBVIOUSLY,"
I1770 PRINT "A "HELL-OUT ANSWER MAY TELL YOU HOW TO WRITE PERSUASIVELY"
I1780 PRINT "ABOUT "SS."
I1790 GOTO 12598
I1800 PRINT "THE ADDING MAY SOUND HUMOROUS IN THIS QUESTION."
I1810 PRINT "LET'S TRY A SIMPLE ASSOCIATION GAME!"
I1820 PRINT "IF I SAY "SS"
I1830 PRINT "AND IF I SAY "PURPOSE"
I1840 PRINT "WHAT DO YOU THINK ABOUT? DESCRIBE OR EXPLAIN."
I1850 GOTO 12598
I1860 PRINT "I MEAN WHAT WOULD BE THE LAST ACHIEVEMENT?"
I1870 GOTO 12598
I1880 PRINT "SOMETIMES, "SS", PURPOSES OR GOALS CHANGE. HAS"
I1890 PRINT "THIS HAPPENED WITH "SS?"
I1900 PRINT "WHY OR ANY NOT?"
I1910 GOTO 12598
I1920 PRINT "WHEN THERE IS A DISAGREEMENT ABOUT THE FINAL PURPOSE"
I1930 PRINT "OR A PARTICULAR ACTION, USUALLY NOT EVERYONE AGREES"
I1940 PRINT "ABOUT THE ULTIMATE PURPOSE, IF THERE ARE DIFFERENCES"
I1950 PRINT "ABOUT WHAT SHOULD HAPPEN, DESCRIBE THEM."
I1960 PRINT "CERTAINLY, "SS" IS SUCH A TOPIC."
I1970 GOTO 12598
I1980 PRINT "HAVE SOME FUN WITH THIS QUESTION. PRETEND YOU ARE"
I1990 PRINT "A FORTUNE-TELLER! WHAT DO YOU PREDICT? WHAT SAY"
I2000 PRINT "YOU, GREAT PROPHET OF "SS?"
I2010 GOTO 12598
I2020 PRINT "EVERYONE AT SOME TIME HAS FELT THAT THE END OF ONE THING"
I2030 PRINT "IS JUST THE BEGINNING OF ANOTHER. CERTAINLY, THIS GUT"
I2040 PRINT "FEELING IS TRUE OF "SS."
I2050 PRINT "DO YOU AGREE WITH ME? ANY OR ANY NOT?"
I2060 GOTO 12598
I2070 PRINT "WHAT'S THE BIG PICTURE, "SS? HOW DOES"
I2080 PRINT "SS FIT INTO THE OVERALL SCHEME?"
I2090 GOTO 12598
I2100 PRINT "WHY DOES "SS" DENY OUR"
I2110 PRINT "ATTENTION IN THIS DAY AND AGE, WHAT REASONS CAN YOU"
I2120 PRINT "GIVE FOR THE IMPORTANCE OF YOUR TOPIC?"
I2130 GOTO 12598
I2140 PRINT "I WAS HOPING YOU WOULD ASK. NEW SOLUTIONS POSSIBLE HERE"
I2150 PRINT "PROBLEMS" YOU CAN COUNT ON IT; NOT THINK ABOUT "SS"
I2160 PRINT "KNOWING MORE ABOUT "SS"
I2170 PRINT "MADE MORE PROBLEMS, DO YOU AGREE WITH ME?"
I2180 PRINT "ANY OR ANY NOT?"
FOR EXAMPLE, IF I WERE WRITING ABOUT POLITICAL CORRUPTION.
I MIGHT DEVELOP THE IDEA THAT CORRECTING POLITICAL
CORRUPTION MEANS SOLVING MANY LAW ENFORCEMENT PROBLEMS.

FOR EXAMPLE, IF I WERE WRITING ABOUT YOUR TOPIC, THIS WOULD BE THE
"FIRST QUESTION I WOULD WANT TO ANSWER."

GOTO 12580
PRINT "Prompters after clarification.
PRINT "TRY ANSWERING THIS QUESTION NOW."
GOTO 12580
PRINT "WHAT ARE YOU THINKING NOW, "NI3"?"
GOTO 12580
PRINT "YOUR TURN, "NI3"."
GOTO 12580
PRINT "SECOND RESPONSE AFTER CLARIFICATION REQUEST.
PRINT "THAT'S ALL I CAN DO AT THE MOMENT, SORRY!"
GOTO 12580
IF C<5 THEN 12690
IF C>7 THEN 12690
PRINT "YOU EXPLORERED 3 QUESTIONS IN THESE FEW MINUTES," PRINT "BUT YOU ARE NOT FINISHED INVENTING YET."
PRINT "YOU ARE STILL IN THE FIRST STAGES"
PRINT "OF THE CREATIVE PROCESS, THE IDEAS YOU HAVE COME"
PRINT "UP WITH, "NI3", NOW NEED TO SIMMER FOR A LITTLE"
PRINT "TIME."
PRINT "I HOPE THAT YOU CAN NOW "GENERATE" YOUR OWN QUESTIONS"
PRINT "FROM BURKE'S FIVE PERSPECTIVES. DON'T NEGLECT THE"
PRINT "RATIOS AS YOU WRITE YOUR PAPER."
PRINT "I HOPE YOUR PAPER ON "NI3"
PRINT "IS TERRIFIC."
PRINT "GOOD BYE, "NI3"."
STOP
PRINT "YOU WERE ASKED QUESTIONS AND FULLY EXPLAINED"

PRINT, "EXCUSE THEM."

PRINT, "PLEASE COME BACK WHEN YOU CAN STAY LONGER."

PRINT, "GOOD BYE."

END
REM << INVENTION PROGRAM: TAGMEMIC MATRIX >>
REM << AUTHOR: MUG BURNS >>
REM << THIS PROGRAM MAY BE USED ONLY WITH AUTHOR'S PERMISSION >>
REM USE WITHOUT DIRECT PERMISSION VIOLATES COPYRIGHT LAW, >>

20050 RANDOMIZE
g600 DIM Z(54)
30070 Z(0)=2
30080 DIM X(54)
30080 X(0)=9
4141 W=16*36+94+X*6=0 "COUNTERS"
41110 PRINT
g120 PRINT
30130 PRINT
g140 PRINT
30150 PRINT
30180 PRINT,"A COMPUTER-ASSISTED INVENTION PROGRAM!
30170 PRINT."--------------------------------------------"  
30180 PRINT
30190 PRINT,"THE TAGMEMIC MATRIX"
30200 PRINT,"------------------------------------------"

30250 PRINT,"HI! WELCOME TO COMPUTER-PROMPTED EXPLORATION.
30260 PRINT
30270 PRINT "PLEASE TYPE IN YOUR FIRST NAME: ";
30280 LINE INPUT N15
30290 IF N15="" THEN 280
30300 PRINT
30390 PRINT "NOW, "N15", PLEASE TYPE IN YOUR LAST NAME: ";
30320 LINE INPUT N25
30330 IF N25="" THEN 280
30340 IF N25=">TEST?" THEN 3850
30350 PRINT
30360 PRINT "THANK YOU, "N15", "N25". I HOPE I CAN BE OF SOME
30370 PRINT "ASSISTANCE TO YOU TODAY. IF WE TAKE EACH OTHER
30380 PRINT "SERIOUSLY . . ."
30390 PRINT "I KNOW YOU'LL THINK ABOUT YOUR TOPIC AS YOU NEVER HAVE BEFORE."
30400 PRINT
30410 PRINT
30420 PRINT,"BEFORE WE BEGIN, "N15", THERE'S AN OLD"
30430 PRINT "SAYING ABOUT COMPUTER-ASSISTED INSTRUCTION. IT GOES!
30440 PRINT,"GARBAGE IN, GARBAGE OUT!"
30450 PRINT
30460 PRINT "IN OTHER WORDS, YOU AND I MUST COOPERATE SO THAT"
30470 PRINT "YOU CAN GET A GOOD START ON YOUR RESEARCH PAPER,"
30480 PRINT
30490 PRINT
30500 PRINT, "(PRESS 'RETURN' TO CONTINUE):"
30520 LINE INPUT A9
30530 PRINT
30540 PRINT
30550 PRINT
30560 PRINT "WOULD YOU LIKE TO REVIEW THE DIRECTIONS AND THE COMMANDS?"
PRINT ""'YES OR NO?"
PRINT "$^N$'"  
IF $^N$ THEN 420
PRINT "$^N$"  
NEW " "DIRECTIONS AND COMMANDS"
PRINT 
PRINT 
PRINT "DIRECTIONS" 
PRINT 
PRINT "1. WHEN YOU MAKE A TYPING ERROR, "'NISI', AND" 
PRINT "THIS TO CORRECT IT, USE THE 'REPUBLIC' OR 'ROBY' KEY."
PRINT "THE 'SHIFT' MUST BE DEPRESSED WHEN YOU 'REPUBLIC'."
PRINT "THE 'SHIFT' MAY LOOK A LITTLE FUNNY (LIKE WRITING BACKWARDS)."
PRINT "DON'T WORRY; IT WORKS THAT WAY."
PRINT ""(NOTE: SPELLING IS NOT CRUCIAL TO INVENTION.)"
PRINT 
PRINT "2. REMEMBER THAT I CAN ONLY READ ABOUT A LINE AT A" 
PRINT "TIME -- ABOUT THIS MUCH:" 
PRINT 
PRINT ""------------------------------------------"
PRINT "PRINT "RETURN" AT THAT POINT AND I'LL GENERALLY"
PRINT "ASK YOU TO CONTINUE, IF THAT DOES NOT WORK, TYPE" 
PRINT """'NISI'" AND I'LL SAY 'GO ON, "NISI'"." 
PRINT 
PRINT "PRINT "RETURN" TO CONTINUE,"" 
INPUT A$ 
PRINT 
PRINT "PRINT "'YES'" 
PRINT "PRINT "'NO'
PRINT "PRINT "'3. AFTER YOU FINISH TYPING YOUR RESPONSE, YOU MUST PRESS"
PRINT "RETURN' AT THAT POINT AND I'LL READ YOUR"
PRINT "RESPONSE AND SAY SOMETHING BACK TO YOU."
PRINT 
PRINT "PRINT "NO OBJECTIVE, YOU MUST"
PRINT "PLEASE ASK QUESTIONS, YOU'LL BE SURPRISED BY HOW MUCH"
PRINT "'NISI' (OR SO I HOPE); I'M NOT GUARANTEING THE TRUTH."
PRINT "BUT I'LL DO THE VERY BEST I CAN, "HISTORY IS STILL"
PRINT "DEVELOPING."
PRINT 
PRINT "("PRESS 'RETURN' TO CONTINUE.")"
PRINT 
PRINT 
PRINT """
21140 PRINT
21150 PRINT
21160 PRINT
21170 PRINT "COMMAND?", "TYPE IN--", "I'LL DO THIS--";
21180 PRINT "-----------", "-------------"
21190 PRINT
21200 PRINT "STOP!", "I'LL STOP ASKING QUESTIONS AND CLOSE."
21210 PRINT
21220 PRINT "CONTINUE!", "I'LL SKIP AHEAD TO THE NEXT QUESTION."
21230 PRINT
21240 PRINT "REPEAT!", "I'LL REPEAT THE QUESTION."
21250 PRINT
21260 PRINT "DIRECTIONS!", "I'LL SHOW YOU THESE DIRECTIONS AGAIN."
21270 PRINT
21280 PRINT "CHANGE!", "I'LL LET YOU CHANGE OR NARROW YOUR SUBJECT."
21290 PRINT
21300 PRINT "?", "I'LL LET YOU ASK A QUESTION."
21310 PRINT
21320 PRINT "EXPLAIN!", "I'LL EXPLAIN THE QUESTION."
21330 PRINT
21340 PRINT "PARTICLE!", "I'LL LET YOU SELECT THE NEXT TAGONIC"
21350 PRINT "PARTICLE'S PERSPECTIVE. YOU CAN ALSO TYPE"
21360 PRINT "WAVE! OR 'FIELD'!
21370 PRINT
21380 PRINT "4", "I'LL LET YOU CONTINUE WITH YOUR RESPONSE."
21390 PRINT
21400 PRINT "", "(PRESS 'RETURN' TO CONTINUE.)";
21410 INPUT AS
21420 PRINT
21430 PRINT
21440 PRINT
21450 PRINT
21460 PRINT
21470 PRINT "THO LAST THINGS:";
21480 PRINT
21490 PRINT
21500 PRINT "*** THINK OF ME AS A PERSON WHO CAN ASK A LOT OF"
21510 PRINT "INTERESTING, THOUGHT-PROVOKING, AND WILD QUESTIONS."
21520 PRINT
21530 PRINT
21540 PRINT "*** SCREAM FOR HELP IF I START ACTING REALLY CRAZY!"
21550 PRINT "PARTICULARLY, IF I DON'T SEEM TO BE ANSWERING YOU,"
21560 PRINT
21570 PRINT
21580 PRINT "", "(PRESS 'RETURN' TO GO ON.)"
21590 PRINT
21600 PRINT
21610 PRINT
21620 PRINT
21630 PRINT
21640 PRINT
21650 PRINT
21660 INPUT AS
21670 IF ON THEN 1690
21680 GOTO 1760
21690 PRINT
21700 PRINT "BACK TO THE QUESTIONS, "418" ---- ---- ----"
PRINT "DO YOU WISH TO SEE A SHORT DESCRIPTION OF THE TAGMENIC MA
PRINT "RINT:" "YES OR NOT?"
INPUT JS="YES"
GOSUB 6370
IF JS = "YES" THEN 1850
GOTO 2140
REM DESCRIPTION OF TAGMENIC MATRIX
PRINT "THE TAGMENIC MATRIX ENCOURAGES A "WRITE TO" "
PRINT "THINK ABOUT A TOPIC FROM NINE PERSPECTIVES."
PRINT "FOR THIS PROGRAM, HOWEVER, I HAVE SIMPLIFIED THIS A "
PRINT "BIT. THIS PROGRAM WILL ASK YOU QUESTIONS FROM ONLY THREE "
PRINT "PERSPECTIVES, WHICH YOU WILL RECALL FROM OUR CLASS DISCUSSION."
PRINT "1. PARTICLE -- VIEWING A SUBJECT IN ITSELF (STATIC)"
PRINT "2. "WRITE -- VIEWING A SUBJECT AS IT CHANGES (DYNAMIC)"
PRINT "3. FIELD -- VIEWING A SUBJECT'S RELATIONSHIP TO OTHERS"
PRINT "SUBJECTS (IN A SYSTEM)"
PRINT "(HIT 'RETURN' TO CONTINUE)"
PRINT "SUBJECT SEQUENCE"
INPUT AS
PRINT "NOW I MUST ASK YOU WHAT YOU ARE 'WRITING'"
22360 PRINT "ABOUT. SO WOULD YOU PLEASE TYPE IN YOUR SUBJECT."
22390 PRINT "(I AM LOOKING FOR ONE TO THREE WORDS, MAYBE FOUR.)"
22400 PRINT
22410 PRINT
22420 PRINT
22430 PRINT
22440 PRINT
22450 PRINT
22460 INPUT SS
22470 IF SS="" THEN 2400
22480 IF LEN(SS)<>3 THEN 2550
22490 PRINT
22500 PRINT "THAT'S A MOUTHFUL, "NIS", MAKE IT SHORTER, LIKE A TITLE.
22510 PRINT
22520 PRINT "HERE ARE THREE EXAMPLES!"
22530 PRINT " " RELIGIOUS CULTS"
22540 PRINT " " LASER BEAMS"
22550 PRINT " " THE NAHANO CULTURE TODAY"
22570 PRINT
22580 PRINT "YOUR TURN, WHAT IS YOUR SUBJECT?"
22590 GOTO 2320
22600 IF 1650 THEN 2570
22610 GOTO 2450
22620 PRINT
22630 PRINT
22640 INPUT SS
22650 PRINT
22660 PRINT
22670 GOTO 2270
22680 ON J GOTO 2290,2290,2750
22690 PRINT "REALITY; THAT'S FUNNY, I USED TO HATE A COMPUTER INTERESTS:
22700 PRINT SS"
22710 GOTO 2750
22720 PRINT "KEY, THAT'S COOL, "NIS": WE'LL HAVE A GOOD TIME"
22730 GOTO 2750
22740 GOTO 2750
22750 PRINT "M", MHHHHH! YOU'LL BE SURPRISED"
22760 PRINT "BY THE RECENT SCHOLARSHIP ON THIS TOPIC. ASK THE"
22770 PRINT "LIBRARIAN IN THE REFERENCE AREA."
22780 PRINT
22790 PRINT "(HINT 'RETURN' TO CONTINUE.)"
22800 INPUT AB
22810 REM " " PURPOSE SEQUENCE ""
22820 PRINT
22830 PRINT
22840 PRINT
22850 PRINT
A comment about your purpose:

"Writing without a purpose or aim, "mis" 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 this point, so now would you briefly describe the purpose of your paper by completing this statement:"

Purpose of your paper...

"Fine, "mis", you and I will talk again about your purpose.

"Before we continue, "mis", I want you to think about your purpose once again.

You have already told me that your purpose was...

"To this point, if nothing else, I want my reader to...

"Okay, good. Let's keep your purpose in mind."
33400 IF F=1 THEN 8920
33410 PRINT
33420 PRINT
33430 PRINT
33440 PRINT,*HERE IS YOUR NEXT QUESTION = NUMBER C+1."
33450 PRINT
33460 PRINT
33470 PRINT
33480 PRINT
33490 GOTO 4078
33500 PRINT *PURPOSE SEQUENCE AT C+1=12
33510 IF N=1 THEN 3468
33520 PRINT
33530 PRINT,"LET'S PAUSE ONCE AGAIN TO CONSIDER YOUR INTENT,"
33540 PRINT
33550 PRINT,"YOUR GENERAL PURPOSE IS TO"
33560 PRINT P1"
33570 PRINT
33580 PRINT,"ALSO, YOU WANT YOUR READER TO"
33590 PRINT P1"
33600 PRINT
33610 PRINT,"IS THERE ANYTHING ELSE YOU WISH TO SAY ABOUT YOUR PURPOSE ?"
33620 PRINT,*(YES OR NOT)?"
33630 J=**YES**
33640 GOSUB 4670
33650 IF E=1 THEN 3648
33660 PRINT
33670 PRINT,"FINE, "418", ENOUGH ABOUT YOUR PURPOSE."
33680 GOTO 3468
33690 PRINT
33700 PRINT
33710 PRINT,"SUPER, "418", WHAT WOULD YOU LIKE TO ADD?"
33720 PRINT,"(AGAIN, ONE LINE LIMIT IN EFFECT)"
33730 PRINT
33740 INPUT P1"
33750 IF P1="" THEN 3740
33760 GOSUB 3780
33770 GOTO 3648
33780 PRINT
33790 INPUT,*(ANY MORE?)
33800 PRINT,"(IF SO, TYPE WHATEVER IT IS); IF NOT, TYPE "40","
33810 PRINT
33820 INPUT A1"
33830 INPUT P2"
33840 RETURN
33850 PRINT *PAGING FOR QUESTIONS
33860 PRINT
33870 PRINT
33880 PRINT
33890 PRINT
33900 PRINT
33910 PRINT,"HERE WE GO. RELAX AND ENJOY THE MIND-STRETCHING!"
33920 PRINT
33930 PRINT
33940 PRINT
33950 PRINT
33960 PRINT
33970 PRINT
33980 PRINT
33990 PRINT
PRINT
GOTO A400
PRINT, "BACK TO THE QUESTIONS. "N19" ---- ---- ---- ----
PRINT
PRINT
GOTO A130
REM " " ---- COUNTER/EXPLORATION CONTROLS ----
GOTO 4490
PRINT
GOTO 4510
GOTO 4520
GOTO 4530
GOTO 4540
GOTO 4550
GOTO 4560
GOTO 4570
GOTO 4580
GOTO 4590
GOTO 4600
GOTO 4610
GOTO 4620
GOTO 4630
GOTO 4640
GOTO 4650
GOTO 4660
GOTO 4670
GOTO 4680
GOTO 4690
ON 2 GOTO 5490,5550,5560,5170,5190,5220,5230,5280,5310,5340
ON 3 GOTO 5470,5480,5490,5500,5520,5540,5620,5630,5640,5660
ON 2 GOTO 5470,5480,5490,5500,5520,5540,5620,5630,5640,5660
ON 2 GOTO 5450,5450,5460,5470,5480,5490,5500,5520,5540,5560
ON 2 GOTO 5450,5450,5460,5470,5480,5490,5500,5520,5540,5560
REM " " ---- FOR SUBJECT CONTROL-MANAGING ----
GOTO 4520 GOTO 4530 GOTO 4540 GOTO 4550 GOTO 4560 GOTO 4570 GOTO 4580 GOTO 4590 GOTO 4600 GOTO 4610 GOTO 4620 GOTO 4630 GOTO 4640 GOTO 4650 GOTO 4660 GOTO 4670 GOTO 4680 GOTO 4690 ON 2 GOTO 5490,5550,5560,5170,5190,5220,5230,5280,5310,5340
ON 3 GOTO 5470,5480,5490,5500,5520,5540,5620,5630,5640,5660
ON 2 GOTO 5470,5480,5490,5500,5520,5540,5620,5630,5640,5660
ON 2 GOTO 5450,5450,5460,5470,5480,5490,5500,5520,5540,5560
ON 2 GOTO 5450,5450,5460,5470,5480,5490,5500,5520,5540,5560
34480 IF CA12 THEN 3590
34481 IF CA59 THEN 3500
34482 IF PB23 THEN 5830
34483 PRINT
34484 IF A16=5 THEN A16
34485 PRINT "HERE IS QUESTION" + A PARTICLE QUESTION."
34486 PRINT
34487 2W=INT(23+RN+1)
34488 IF Z(0)=1 THEN 4670
34489 Z(0)=1
34490 GOTO 4330
34491 =A34E1
34492 =A16=5
34493 =C81
34494 IF CA16 THEN 3170
34495 IF CA12 THEN 3500
34496 IF CA59 THEN 12260
34497 IF A16=1 THEN 5030
34498 PRINT
34499 PRINT "HERE IS QUESTION" + A FIELD QUESTION."
34500 PRINT
34501 2W=INT(23+RN+1)
34502 IF Z(0)=1 THEN 4980
34503 IF Z(0)=1 THEN 4980
34504 Z(0)=1
34505 GOTO 4300
34506 PRINT
34507 PRINT "SORRY, NO MORE QUESTIONS LEFT HERE, WHAT NOW?"
34508 GOTO 7430
34509 NEW =A "TAZMERIC QUESTION POOL" +A
34510 NEW =A "PARTICLE" +A "MOUNT OF VIEW" +A
34511 PRINT "DESCRIBE THE PHYSICAL CHARACTERISTICS OF"
34512 GOTO 7460
34513 PRINT "WHAT IS " +A "STATIC"?
34514 GOTO 7460
34515 PRINT "WHAT MAKES " +A "SS"?
34516 GOTO 7460
34517 PRINT "DESCRIBE ITS ESSENTIAL CHARACTERISTICS."
34518 GOTO 7460
34519 PRINT "WHAT ELEMENTS DOES " +A "CONTAIN? ELABORATE."
35170 PRINT "IF I CONFINE "$5" IN A CIRCLE; WHAT DOES"
35270 PRINT "IT SUGGEST? TAKE A DEEP BREATH AND THINK, "HLS", ""
35210 GOTO 7340
35220 PRINT "IF I PLACE "$5" IN A MAZE, WHAT DOES IT"
35230 PRINT "SUGGEST? TAKE YOUR TIME," ""
35240 GOTO 7340
35250 PRINT "IF I PLACE "$5" OUTSIDE A CIRCLE," ""
35260 PRINT "WHAT DOES IT SUGGEST TO YOU?"
35270 GOTO 7340
35280 PRINT "DESCRIBE THE PHILOSOPHICAL CHARACTERISTICS OF"
35290 PRINT "$5", ""
35300 GOTO 7340
35310 PRINT "DESCRIBE THE SOCIOLOGICAL CHARACTERISTICS OF"
35320 PRINT "$5", ""
35330 GOTO 7340
35340 PRINT "DESCRIBE THE POLITICAL CHARACTERISTICS OF"
35350 PRINT "$5", ""
35360 GOTO 7340
35370 PRINT "DESCRIBE THE CULTURAL CHARACTERISTICS OF"
35380 PRINT "$5", ""
35390 GOTO 7340
35400 PRINT "DESCRIBE THE SPIRITUAL CHARACTERISTICS OF"
35410 PRINT "$5", ""
35420 GOTO 7340
35430 PRINT "DESCRIBE THE HISTORICAL CHARACTERISTICS OF"
35440 PRINT "$5", ""
35450 GOTO 7340
35460 PRINT "HOW IS "$5" ISOLATED FROM OTHER SIMILAR"
35470 PRINT "TOPICS?"
35480 GOTO 7340
35490 PRINT "WHAT FEATURES OF "$5" REMAIN THE SAME"
35500 PRINT "OVER TIME?"
35510 GOTO 7340
35520 PRINT "WHAT FEATURES OF "$5" DO NOT CHANGE OVER"
35530 PRINT "TIME?"
35540 GOTO 7340
35550 PRINT "WHAT IS THE MOST OUTSTANDING PHYSICAL FEATURE OF"
35560 PRINT "$5?"
35570 GOTO 7340
35580 PRINT "TAKE A MENTAL PHOTOGRAPH OF "$5", DESCRIBE"
35590 PRINT "ONE IMPORTANT DETAIL.
35600 GOTO 7340
35610 PRINT "IMAGINE ENLARGING A PHOTOGRAPH OF "$5", WHAT"
35620 PRINT "DETAILS OF FEATURE WOULD YOU BRING INTO FOCUS? EXPLAIN,"
35630 GOTO 7340
35640 PRINT "SEPARATE THE PROPERTIES OF "$5", HOW LIST"
35650 PRINT "THEM."
35660 GOTO 7340
35670 PRINT "WHAT INSULATES "$5" FROM THE REST OF"
35680 PRINT "THE WORLD?"
35690 GOTO 7340
35700 PRINT "LIST THE STATIC GEOGRAPHIC FEATURES OF "$5",""
35710 GOTO 7340
35720 PRINT "LIST THE STATIC ECONOMIC CONSIDERATIONS OF"
35730 PRINT "$5","
35740 GOTO 7340
35750 PRINT "$5", HOW "$5" PHYSICALLY CHANGES,"
247

25768 GOTO 7049
25769 PRINT "HOW LONG DOES IT TAKE FOR "SS" TO CHANGE?"
25770 PRINT "EXPLAIN YOUR REASONING."
25771 GOTO 7049
25772 PRINT "WHAT FACTORS CAUSE "SS" TO CHANGE? ELABORATE."
25773 GOTO 7049
25774 PRINT "LIST ONE OR TWO OF "SS" VALUE DYNAMIC".
25775 GOTO 7049
25776 PRINT "CHARACTERISTICS."
25777 Z(25)=1
25778 GOTO 7049
25779 PRINT "HOW IS "SS" LIKE A PLANT? DESCRIBE THE SEED."
25781 Z(26)=1
25782 GOTO 7049
25783 PRINT "HOW DOES "SS" GROW? USE YOUR IMAGINATION."
25784 PRINT "NIS"."
25785 GOTO 7049
25786 PRINT "HOW DOES "SS" CHANGE INTO SOMETHING ELSE."
25787 GOTO 7049
25788 PRINT "ELABORATE."
25789 GOTO 7049
25790 PRINT "HOW DOES "SS" INTERACT WITH FORCES AROUND ITSELF?"
25791 GOTO 7049
25792 PRINT "HOW COUL (?) "SS" CHANGE SO THAT MORE PEOPLE"
25793 PRINT "WOULD BELIEVE, ACCEPT, OR UNDERSTAND? EXPLAIN."
25794 Z(27)=1
25795 GOTO 7049
25796 PRINT "HOW IS "SS" LIKE A CHAIN REACTION? DESCRIBE."
25797 GOTO 7049
25798 PRINT "HOW IS "SS" LIKE AN OCEAN TIDE? REACH A"
25799 PRINT "FOR IT, "NIS"."
25800 GOTO 7049
25801 PRINT "FIELD PERSPECTIVE >>>
25802 PRINT "ON THIS PLANET, HOW IS "SS" DISTRIBUTED?"
25803 GOTO 7049
25804 PRINT "DESCRIBE."
25805 GOTO 7049
25806 PRINT "IS "SS" FOUND AMONG ALL PEOPLES, ALL NATIONS?"
25807 PRINT "WHY OR WHY NOT?"
25808 GOTO 7049
25809 PRINT "NOW IS THE MAJOR CONCERN OF "SS" LOCALIZED?"
25810 GOTO 7049
25811 PRINT "WHAT SYSTEM OF BELIEFS SURROUND "SS"?"
25812 GOTO 7049
25813 PRINT "ELABORATE."
25814 GOTO 7049
25815 PRINT "VIEW "SS" AS AN ABSTRACT, MULTIDIMENSIONAL".
25816 GOTO 7049
25817 PRINT "SYSTEM. WHAT DOES THIS PERSPECTIVE SUGGEST?"
25818 GOTO 7049
25819 PRINT "NOW ARE THE CHUNKS OR COMPONENTS OF "SS"
25820 PRINT "ORGANIZED IN RELATION TO ONE ANOTHER? DESCRIBE."
25821 Z(40)=1
25822 GOTO 7049
25823 PRINT "IS "SS" BEST ARRANGED BY SPACE, TIME, OR"
25824 PRINT "CLASS?"
25825 Z(38)=1
25826 GOTO 7049
25827 PRINT "WHAT ORGANIZATIONAL PRINCIPLE DO YOU SEE IN"
25828 PRINT "SS?"
25829 GOTO 7049
25830 PRINT "THINK OF "SS" AS AN ELECTRON. WHAT IS THE"
25831 GOTO 7049
25832 PRINT "NUCLEUS IDEA IT REVOLVES AROUND? DESCRIBE."
I suggest that "SS" does not exist. What does its existence depend upon?

"How is "SS" only a piece of the puzzle?"

"How is "SS" like a blueprint?"

"How is "SS" like the human blood system?"

"How is "SS" becoming invisible, and is it?"

"What rules hold "SS" together? Everything has rules."

"If you could change anything about "SS","" explain your rationale."

"What would it be? Describe your rationale."

"Is "SS" a part of a good or a bad system?"

"Is "SS" a part of a strong or weak system?"

"Describe the forces pulling at each end."

"Describe the series of layers, go down."

"Describe the forces which are pulling at each end."

"Is "SS" now a series of layers, go down."

"Imagine "SS" is a family unit. Describe the father, the mother, the grandparents, etc."

"Describe the winter, spring, summer, and fall of."

"Think about it. How?"

"Describe the community, does "SS" belong?"

"What community does "SS" belong to?"

Keyword subroutine (single-line inputs) >>>

If I is *** then 687A

[2]

IF I=1 THEN 687A

LOAD(10)

IF I=0 THEN 684A
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2490  REM ** SEMANTIC READING ***
2491  PRINT
2492  PRINT  JS= "**CONTINUE:**"
2493  GOSUB 6670
2494  IF #1 THEN 8290
2495  IF #1 = "40" THEN 8720
2496  JS= "STOP;**"
2497  GOSUB 6880
2498  IF #1 THEN 12200
2499  JS= "REPEAT;**"
2500  GOSUB 6880
2501  IF #1 THEN 9540
2502  JS= "DIRECTIONS;**"
2503  GOSUB 6880
2504  JS= "GTT"}
2505  GOSUB 6880
2506  IF #1 THEN 420
2507  JS= "NOW?**"
2508  GOSUB 6880
2509  IF #1 THEN 9960
2510  JS= "WHY?**"
2511  GOSUB 6880
2512  IF #1 THEN 9150
2513  JS= "***"
2514  GOSUB 6880
2515  IF #1 THEN 6850
2516  JS= "EXPLAIN;**"
2517  GOSUB 6880
2518  JS= "NOW?**"
2519  GOSUB 6880
2520  IF #1 THEN 9670
2521  JS= "OGHKT UNDERST**"
2522  GOSUB 6880
2523  IF #1 THEN 9670
2524  JS= "OGHKT EME**"
2525  GOSUB 6880
2526  IF #1 THEN 9670
2527  JS= "OGHKT PRO **"
2528  GOSUB 6880
2529  IF #1 THEN 9670
2530  JS= "OGHKT CR **"
2531  GOSUB 6880
2532  IF #1 THEN 9250
2533  JS= "KAN I **"
2534  GOSUB 6880
2535  IF #1 THEN 9250
2536  JS= "KAN IT **"
250
37500 IF K(i) THEN 9290
37509 JSK*47**
37510 GOSUB 6890
37519 IF K(i) THEN 8958
37520 JSK*5ECUSE*
37530 GOSUB 6890
37540 IF K(i) THEN 9190
37549 JSK*SPACIEX*
37550 GOSUB 6890
37560 IF K(i) THEN 5569
37569 JSK*HAVE*/
37570 GOSUB 6890
37580 IF K(i) THEN 5719
37589 JSK*FIELD*/
37590 GOSUB 6890
37600 IF K(i) THEN 4079
37610 IF LAM THEN 8249
37620 IF CAM THEN 7689*REQUIRES SHORT ANSWERS AFTER & COMMAND
37630 IF LENV(1)="13 THEN 9229
37640 ATLEN(IS) "CHECKS LENGTH OF INDIVIDUAL STRINGS/WORDS" 37650 FOR K=1 TO A:1 37660 IF (IS(IS,A-1))=" THEN 7819
37670 NEXT K 37680 IF K=15 THEN 7840*GARAGE OR JARGON RESPONSE
37690 GOTO 7620
37700 X90 37710 Y80
37720 NEXT K 37730 GOTO 7869
37740 JSK*JEUX 37750 GOTO 8778
37760 Y88 37770 REM "<<< LEADERS GROUP ENDO an D E J FRIENDS >>>
37780 PRINT 37790 PRINT 37800 PRINT 37810 PRINT 37820 PRINT 37830 PRINT 37840 PRINT 37850 IF K=1 THEN 8519
37860 ON F: GOTO 7950,7970,7990,8010
37870 PRINT "GOOD, "NIS", ADD TO YOUR RESPONSE now."
37880 GOTO 7200
37890 PRINT "FINE, "NIS", WRITE SOME MORE."
37900 GOTO 7300
37910 PRINT "THAT'S THE IDEA, "NIS", GIVE ME SOME MORE INFO."
37920 GOTO 7400
37930 PRINT "SOME, "NIS", GOOD ONE, A LITTLE MORE PLEASE."
37940 GOTO 7500
37950 GOTO 7600
37960 GOTO 7700
37970 GOTO 7800
37980 GOTO 7900
37990 GOTO 8000
38000 GOTO 8100
38010 GOTO 8200
38020 GOTO 8300
38030 ON F2 GOTO 8500,8600,8700,8800,8900,9120
38040 PRINT "SUPER, "NIS!"
38050 GOTO 8110
38060 PRINT "OUTSTANDING, "NIS!"
38070 GOTO 8130
38080 PRINT "FANTASTIC, "NIS!"
38090 GOTO 8130
38100 PRINT "PERFECT, "NIS!"
38110 GOTO 8130
38120 PRINT "GREAT, "NIS!"
38130 PRINT
38140 E8X=1  "E8=COUNT FOR EXPLORED QUESTIONS
38150 PRINT; "ANYTHING ELSE?"
READ4 IF E33X THEN 8200
26170 PRINT,"(YOU CAN ADD MORE INFO, ASK A"
26180 PRINT,"QUESTION, OR GIVE A COMMAND --"
26190 PRINT,"WHATEVER YOU WISH.)"
26200 PRINT
26210 LS="YES"
26220 GOSUB 6670
26230 IF K161 THEN 8920
26240 L=1
26250 GOTO F180
26260 PRINT
26270 PRINT,"O K A Y . "
26280 PRINT;"PREVENTS REPEATED PURPOSE SEEK, AFTER HEURISTIC CHOICE"
26290 PRINT
26300 IF CH=3 THEN 9320
26310 IF CH=1 THEN 9320
26320 IF CH=2 THEN 3170
26330 IF CH=2 THEN 3500
26340 PRINT
26350 PRINT
26360 LS=INT(13+ANO+1)
26370 ON LS GOTO 6580,6420,6440,6460,6480,6500,6520,9540,8560
26380 PRINT;"SEE IF YOU CAN USE THE WORD 'BECAUSE' IN YOUR NEXT ANSWER"
26390 GOTO 8570
26400 PRINT;"(IF YOU DON'T UNDERSTAND, SAY SO. I'LL TRY TO HELP.)"
26410 GOTO 8370
26420 PRINT;"THEY, HIS, I'M ENJOYING THIS, KEEP ON TRUCKIN'!"
26430 GOTO 8570
26440 PRINT;"(AFTER THE NEXT QUESTION, TYPE 'WHAT?' AND I'LL DO MY THI"
26450 GOTO 8570
26460 PRINT;"NG, OK.)"
26470 GOTO 8579
26480 PRINT;"USE SOME STRONG VERBS IN YOUR ANSWERS WHEN YOU CAN,"
26490 GOTO 8570
26500 PRINT;"LESS PHRASES AND MORE SENTENCES -- USE 'IS' IF NECESSARY"
26510 GOTO 8579
26520 PRINT;"REASONS ARE VERY IMPORTANT, DON'T NEGLECT TYPING THEM IN"
26530 GOTO 8579
26540 PRINT;"ALL IDEAS ARE GOOD IDEAS: TYPE IN WHAT YOU THINK!")"
26550 GOTO 8570
26560 PRINT;"REMEMBER COMMANDS NEED EXCLAMATION MARKS, LIKE PERHAPS!
26570 GOTO 8570
26580 PRINT;"THE LONGER YOUR ANSWERS, THE MORE I CAN HELP YOU RECALL,"
26590 PRINT
26600 PRINT
26610 PRINT;"HERE COMES AN INTERESTING ONE -- NUMBER 'OF'"
26620 GOTO 8730
26630 PRINT;"HERE COMES AN INTERESTING ONE -- NUMBER 'OF'"
26640 GOTO 8730
26650 PRINT;"QUESTIONS THAT ARE ONE OF MY FAVORITES -- COMING UP"
26660 GOTO 8730
26670 PRINT;"LET'S SEE, HOW ABOUT 'QUESTION', 'NEXT, WHERE YOU ARE,'"
26680 GOTO 8730
PRINT "YOUR NEXT QUESTION IS " #10 "NUMERICAL.
PRINT "YES." GOTO 9879
PRINT "RESPONSES TO YES, AFTER INVENT ON PROMPTER"
PRINT "YOU COULD TELL ME " #10 "ANY MORE", BUT " #10 "NO, I'D LIKE TO CONTINUE.""
PRINT "YOU JUST WISH TO CONTINUE, IF " #10 "YES", " #10 "CONTINUE.""
PRINT "DON'T FORGET TO TYPE THE EXCLAMATION POINT!!!"
GOTO 7040
PRINT "GARBAGE OR JARGON RESPONSE"
PRINT "(YOU MAY HAVE FORGOTTEN TO SPACE BETWEEN WORDS," PRINT "AND"
PRINT "YOU COULD TELL ME " #10 "NO", BUT " #10 "IF " #10 "YES", " #10 "CONTINUE.""
PRINT "JUST TO CONTINUE, OR " #10 "REPEAT""
PRINT "TO SEE THE QUESTION AGAIN.)"
PRINT "ANSWERS THE COMMAND " #10 "YES?"
PRINT "WHY NOT?"
PRINT "GO TO 710"
PRINT "ANSWERS THE SINGLE QUESTION " #10 "MARK (!?"
PRINT "GO AHEAD, " #10 "YES?", ASK, I'D LIKE TO KNOW THE REST I CAN.
GOTO 7040
PRINT "ANSWERS A " #10 "YES" TO ANYTHING ELSE?
PRINT "WHAT?"
GOTO 7040
PRINT "RESPONSE TO A " #10 "YES"
IF 28#-2 THEN 9820
IF 28#-2 THEN 9840
PRINT "ANOTHER INTERESTING PROBLEM, AND BASED UPON " #10 "WHAT WE'VE"
PRINT "DONE SO FAR, I'D SAY " #10 "YES?"
GOTO 72120
PRINT "YES, THAT'S RIGHT,
GOTO 72120
GOTO 72120
IF 28#-2 THEN 12240
PRINT "THIS QUESTION " #10 "MIGHT BE BETTER ANSWERED BY A " #10 "HUMANOID," PRINT "PERHAPS DURING YOUR RESEARCH PHASE, KEEP IT IN MIND," 9879
GOTO 12180
PRINT "ANSWERS NOW?"
PRINT "HELLO, THAT'S FOR ME TO KNOW AND FOR YOU TO FIND OUT," 98120
PRINT "SERIOUSLY, THOUGH, I DON'T KNOW " #10 "HOW", LET'S " #10 "REPEAT" 98120
PRINT "EXPLORING FOR AN ANSWER, YOUR TURN, " #10 "YES?"
98120
PRINT "ANSWERS TO SHORT ANSWERS -- " LEN(131"
PRINT "A SHORT AND DIRECT RESPONSE, GOOD, " #10 "YES?
PRINT "EXPLAIN ANY? ELABORATE A LITTLE" 9820
GOTO 7460
PRINT "ANSWERS " #10 "NO?
PRINT "WELL, " #10 "HOW NOT? REMEMBER WE ARE EXPLORING, INQUIRING;" 98120
PRINT "REPEAT FOR " #10 "YES?"
GOTO 7460
PRINT "FEEDBACK FOR " #10 "BECAUSE"
GOTO 7460
PRINT "THAT'S AN INTERESTING REASON," 98120
GOTO 7460
PRINT "RESPONSE TO SHORT ANSWERS -- " LEN(131"
PRINT "A SHORT AND DIRECT RESPONSE, GOOD, " #10 "YES?"
PRINT "WHATEVER YOU THINK BEST, "N13", YOU DECIDE."
GOTO 7040
PRINT "ANSWERS CAN I GET?"
PRINT "YES, OF COURSE."
GOTO 7040
PRINT "AUTO NARROW/CHANGE LOOP"
PRINT "DO YOU WISH TO NARROW OR CHANGE YOUR SUBJECT?"
PRINT "MAYBE REVISE THE WAY IT SOUNDS IN THESE QUESTIONS?"
PRINT "(YES OR NO?)"
PRINT "BEST, "NIS."
PRINT "AS346O & CAN I?
PRINT "AUTO NARROW/CHANGE COMMAND"
PRINT "GOOD FOR YOU, "N13", NOT EVERY WRITEN NARROWS IT"
PRINT "CHANGES HIS OR HER TOPIC THIS EARLY IN THE INVENTION PROC"
PRINT "PLEASE TYPE IN YOUR REVISED SUBJECT:"
GOTO 2360
PRINT "REPRINTS THE QUESTION"
IF "NO" THEN 9540
GOTO 4130
IF "YES" THEN 9660
GOTO 4330
PRINT "SAMPLE CLARIFICATION ARRAY AND EXAMPLE SEQUENCE >>>
PRINT "<<<"
PRINT "BY "STATIC", I MEAN UNCHANGING, INERT, PERHAPS EVEN STAGNANT."  
PRINT "OR UNPROGRESSIVE,"
PRINT "WHERE I WANT YOU TO DESCRIBE THOSE PROPERTIES WHICH ARE"
PRINT "UNIQUE TO "SS","
PRINT "ELEMENTS IS PERHAPS TOO GENERAL A TERM, BUT I WANT YOU TO"
PRINT "LIST THOSE FEATURES WHICH ARE LIMITED TO YOUR TOPIC,"
PRINT "WE ARE AFTER AN INSIDE DEFINITION,"
PRINT "MAINLY, I WANT YOU TO DESCRIBE "SS" AS"
PRINT "A CLOSED SYSTEM--IMPRISONED, CONFINED,"
PRINT "THINKING ABOUT A PUZZLE, NOT CORN (MAIZE). HOW IS"
PRINT "PUZZLING, TRAPPED IN A MAIZE."
PRINT ""SS" SEPARATED FROM A"
PRINT "CLOSING PARTY, ALSO WHAT PREVENTS ITS ENTRY?"
PRINT "CONSIDER QUESTIONS OF EXISTENCE, ETHICS, INTELLECTUAL "AT"
PRINT "OR REASONING PRINCIPLES,"
PRINT "THOSE CHARACTERISTICS OF "SS"
PRINT " WHICH AFFECT SOCIETY IN GENERAL, SOCIAL EVIL?"
PRINT "SOCIAL CLASS COMMUNITY CONCERNS?"
PRINT "GENERALLY, I'M THINKING ABOUT ELEMENTS OF TENSION IN"
PRINT "SS, YOU CAN BE SPECIFIC IF YOU LIKE,"
PRINT "CULTURAL REFERS TO EITHER (1) CIVILIZATIONS, OR (2) HAPPIE "SS""
PRINT "CONSIDERED TO BE EDUCATIONAL, YOU CAN PROBABLY ADD ANOTHER "SS"}
PRINT "AN ANSWER HERE MAY TAKE SOME IMAGINATION, IT COULD"
PRINT "REFER TO THE INTANGIBLE, UNREAL, PERHAPS EVEN SUPERFICIAL"
PRINT "ASPECTS OF "33","
GOTO 12219
PRINT "WHAT IN THE PAST HELPED "33"?"
GOTO 12156
PRINT "FIRST, THINK OF A TOPIC LIKE YOURS, SECOND, DESCRIBE"
PRINT "WHAT "33" IS DIFFERENT,"
GOTO 12156
PRINT "BY REMAIN THE SAME," I MEAN THOSE THINGS ABOUT"
PRINT "33" THAT DO NOT CHANGE,"
PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT COMPUTER ELECTRONICS"
PRINT "A SUBJECT NEAR TO MY HEART-I COULD WRITE HERE A DEFINITIVE"
PRINT "OF SOLID STATE,"
GOTO 12219
PRINT "THinking ABOUT A PHOTOGRAPHIC DESCRIPTION HERE--""
PRINT "BUT NOT A MOVIE, RATHER A STILL PHOTO,"
GOTO 12156
PRINT "IF I SAY "33" TO PEOPLE,"
PRINT "WHAT IS THE FIRST THING THEY COULD SEE IN THEIR MINDS?"
PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT COLLEGE ATHLETICS,"
PRINT "MIGHT FIRST THINK ABOUT FOOTBALL--RECRUITING, PUBLICITY"
PRINT "CHARACTER-BUILDING, BIG-TIME ENTERTAINMENT, ETC.,"
GOTO 12156
PRINT "CONCENTRATE NOW ON SEEING "33","nPRINT "WHAT FEATURE STANDS OUT THE MOST? DESCRIBE,"
PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT UFO SIGHTINGS,"
PRINT "COULD VISUALIZE ALIEN "WORLDS AND STRANGE SAUCER-SHAPED"
PRINT "SPACECRAFT. LOTS OF INTERESTING DETAILS IN SUCH A TOPIC,"
GOTO 12219
PRINT "AM TRYING TO GET YOU TO EXPLAIN WHY SOME FEATURES OF"
PRINT "33" ARE MORE IMPORTANT THAN OTHERS,"
GOTO 12219
PRINT "I AM LOOKING FOR A LIST OF CRUCIAL FEATURES WHICH "33"
PRINT "HELP YOU ORGANIZE YOUR PAPER. AN IMPORTANT QUESTION!"
GOTO 12156
PRINT "MAYBE A CONDITION OF "33" MAKES"
PRINT "IT UNIQUE. IF SO, DESCRIBE,"
GOTO 12219
PRINT "WHERE IS "33" FOUND ON OUR PLANET?"
PRINT "IN THE UNIVERSE? IN THE U.S. OR A?"
GOTO 12219
PRINT "COULD MONEY BE CONSIDERED A FEATURE OF "33"?"
PRINT "HOW SO EXPLAIN,"
GOTO 12219
PRINT "LOOKING FOR YOUR NOTIONS ABOUT THE DEVELOPMENT OF"
PRINT "33", *
PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT HUMAN DEVELOPMENT,"
256

PRINT "ADULT PASSENGERS HAVE BEEN POPULAR FAKE LATELY."
14900 X(24)=1
15000 GOTO 12210
15100 PRINT "WHY AM I WONDERING HERE ABOUT THE RELATIVE SPEED OF CHANGE."
15200 PRINT "WHAT DOES PROGRESS MEAN TO 35?"
15300 GOTO 12150
15400 PRINT "LIKE PEOPLE? LIKE DISEASE? LIKE TIME? LIKE GROWTH?"
15500 PRINT "LIKE MATURITY? LIKE PROGRESS?"
15600 GOTO 12160
15700 PRINT "BY 'DYNAMIC', I MEAN THE TENDENCY FOR 35"
15800 PRINT TO CHANGE. WHAT ENERGIZES 35?"
15900 PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT WOMEN IN POLITICS."
16000 PRINT "I WOULD THINK ABOUT PARTICULAR POLITICAL ORGANIZATIONS LIKE"
16100 PRINT "N.O.W., WHAT ABOUT THE EQUAL RIGHTS AMENDMENT?"
16200 X(25)=1
16300 GOTO 12210
16400 PRINT "I WANT YOU TO BREAK DOWN 35 AND"
16500 PRINT "EXPLAIN ITS ORGANIC DEVELOPMENT."
16600 PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT INFLATION."
16700 PRINT "THE ROOTS MIGHT BE GREED! THE TRUNK MIGHT BE THE AMERICAN"
16800 PRINT "FREE ENTERPRISE SYSTEM AND BLOSSOMS MIGHT BE FOOD PRICES"

16900 X(26)=1
17000 GOTO 12150
17100 PRINT "YOU SHOULD SEE THE ANSWERS I GET TO THIS. HOW!!""
17200 PRINT "I'M AFTER A CREATIVE GUESS."
17300 GOTO 12160
17400 PRINT "YOU KNOW, FROM CHRYSLIS TO BUTTERFLY, A SORT OF"
17500 PRINT "METAMORPHOSIS."
17600 GOTO 12210
17700 PRINT "I GUESS I AM THINKING OF A CHEMICAL EXPERIMENT WITH"
17800 PRINT "35 AS A CATALYTIC AGENT."
17900 GOTO 12160
18000 PRINT "IN OTHER WORDS, WHAT WOULD MAKE 35"
18100 PRINT "MORE CONVINCING?"
18200 PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT DREAM INTERPRETATION."
18300 PRINT "I WOULD ARGUE THAT A GREATER UNDERSTANDING OF JUNG'S PSYCH."
18400 PRINT "LOGIC""
18500 PRINT "WOULD HELP MY AUDIENCE UNDERSTAND THE UNCONSCIOUS SELF."
18600 X(27)=1
18700 GOTO 12160
18800 PRINT "IN OTHER WORDS, HOW DOES THE ACTION OF 35"
18900 PRINT "TRIGGER A REACTION?"
19000 GOTO 12210
19100 PRINT "DOES 35 HAVE EGG AND FLOAT A CYCLE?"
19200 GOTO 12150
19300 PRINT "IS 35 FOUND EVERYWHERE OR WHAT?"
19400 GOTO 12160
19500 PRINT "WHO IS MAINLY INTERESTED IN 35?"
19600 GOTO 12150
19700 PRINT "WHERE IS MOST OF THE ACTION OF 35?"
19800 GOTO 12150
19900 PRINT "A LARGE PEOPLE WITH MANY TOPICS! DESCRIBE THE "
PRINT "INTELLECTUAL DIMENSIONS OF "33"," 11440 GOTO 12180
11450 PRINT "IS THERE A SOLAR SYSTEM (SO TO SPEAK) OF "33"?"
11460 GOTO 12190
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(39) = 1
11530 PRINT "CLASS" MEANS CATEGORIES OR CLASSIFICATIONS, BY THE WAY,
11540 PRINT "ANSWERING THIS QUESTION MAY HELP YOU DETERMINE THE MOST"
11550 PRINT "APPROPRIATE MODE FOR YOUR PAPER,"
11560 PRINT
11570 PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT THE DEPRESSION,"
11580 PRINT "I WOULD BE QUITE CONCERNED ABOUT TIME; MOST HISTORICAL"
11590 PRINT "TOPICS ARE CONCERNED WITH TIME,"
11600 Y(38) = 1
11610 GOTO 12180
11620 PRINT "TIME? SPACE? CAUSE-EFFECT? COMPARISON-CONTRAST?"
11630 PRINT "GENERAL-SPECIFIC? SPECIFIC-GENERAL?"
11640 GOTO 12219
11650 PRINT "WHAT FORCES KEEP "33" IN PLACE?"
11660 PRINT
11670 PRINT "FOR EXAMPLE, IF I WERE WRITING ABOUT SOLAR ENERGY,"
11680 PRINT "I WOULD VISUALIZE SOLAR ENERGY ORBITING EARTH'S DIMINISH"
11690 PRINT "ING:"  
11700 PRINT "ENERGY RESOURCES, SUCH AS GAS, COAL, ETC."
11710 X(37) = 1
11720 GOTO 12190
11730 PRINT "YES, "33", THOUGHT YOU WOULD ASK, I DON'T HAVE"
11740 PRINT "ANY IDEA, I WAS JUST ASKING WHAT YOU THOUGHT, ANYTHING?"
11750 GOTO 12190
11760 PRINT "WHERE DOES "33" FIT INTO THE LARGER SYSTEM?"
11770 GOTO 12210
11780 PRINT "IS THERE A FORMULA TO FOLLOW LIKE MY ALGORITHMS? DESCRIBE"
11790 GOTO 12190
11800 PRINT "AN ANALOGY OF THE "FIELD" PERSPECTIVE--HOW IS"
11810 PRINT ""33" LIKE A PLAN FOR SOMETHING?"
11820 GOTO 12190
11830 PRINT "WHAT IS THE HEART OF "33"? THE ARTERIES?"
11840 PRINT "THE VEINS? DON'T FORGET THE FUNCTIONS INVOLVE,"
11850 GOTO 12190
11860 PRINT "@$%&**%$@## OU!KK! HUT THE FLOOR:!!:"
11870 GOTO 12190
11880 PRINT "DESCRIBE THE BLUE OF "33,"
11890 GOTO 12190
11900 PRINT "IT'S EFFECT ON PEOPLE? THE WAY IT IMPACTS THE PEOPLE INVOLVED?"
11910 GOTO 12213
11920 PRINT "AN EVALUATION, SURE, BUT IT MAY HELP YOU SEE"
11930 PRINT ""33" IN A NEW LIGHT,"
11940 GOTO 12190
11950 PRINT "WHAT DO "33" AND POWER HAVE IN COMMON?"
11960 GOTO 12190
258

PRINT "A MIND-BREAKER, ISN'T IT? LOOKING FOR AN INSIGHT ON"
9790 PRINT "THE INSIDE."
9790 GOTO 12214
12214 PRINT "? "------------------ "? "------------------ ?"
12214 PRINT "DESCRIBE X AND Y."
12214 GOTO 12150
12214 PRINT "LIKE PANCAKES? LIKE A DECK OF CARDS? LIKE A GEOGRAPHICAL"
12214 PRINT "SURVEY?"
12214 GOTO 12180
12214 PRINT "THE CHILD IS THE PARENT PERSON OF THE PERSON PERSON."
12214 GOTO 12180
12214 PRINT "ARE THERE SEASONAL CHARACTERISTICS ABOUT "
12214 PRINT "BIRTH, YOUTH, MATURITY, DEATH?"
12214 GOTO 12150
12214 PRINT "A CATEGORY OF THOUGHT ABOUT "
12214 PRINT "A COLORED "
12214 DESCRIE,"
12214 GOTO 12180
12214 PRINT "PROMPTERS AFTER CLARIFICATION".
12214 PRINT "TRY ANSWERING THIS QUESTION NOW."
12214 GOTO 7040
12214 PRINT "WHAT ARE YOU THINKING, " HIS"
12214 GOTO 7040
12214 PRINT "YOUR TURN, " HIS"
12214 GOTO 7040
12214 PRINT "THAT'S ABOUT ALL I CAN ADD AT THE MOMENT, SORRY."
12214 GOTO 12180
12214 REM "<< CLOSINGS >>"
12214 IF C43 THEN 12590
12214 IF C47 THEN 12520
12214 PRINT "YOU EXPLORED "
12214 PRINT "OF THE "
12214 PRINT "OF QUESTIONS I ASKED."
12214 PRINT "BUT YOU ARE NOT FINISHED INVENTING YET, " HIS"
12214 PRINT "IN THE LANGUAGE OF A COGNITIVE PSYCHOLOGIST, YOU ARE JUST"
12214 PRINT "BEGINNING THE "
12214 PRINT "STAGE, YOUR IDEAS NEED"
12214 PRINT "TO SINK NOW."
12214 PRINT "HOPE YOU NOW CAN ASK YOUR OWN QUESTIONS."
12214 PRINT "FROM THE PERSPECTIVES OF "
12214 PRINT "AND "
12214 PRINT "AS A MATTER OF INTEREST, YOU WERE ASKED."
12214 PRINT "PARTICLE QUESTIONS,""WAVE QUESTIONS, "
12214 PRINT "QUESTIONS,"
12214 PRINT "FINALLY. I HOPE YOUR PAPER ON "
12214 PRINT "IS AS SYSTEMATICALLY ORGANIZED AND POLISHED AS IT HAS"
12214 PRINT "SYSTEMATICALLY THOUGHT ABOUT TODAY."
12214 PRINT "COORDINALLY."
12214 PRINT "A INDIRE CREATIVE SPIRIT"
12214 STOP
12214 PRINT "YOU MUST BE A DEEP "
12214 PRINT "HERE, " HIS".
259

12550 PRINT "YOU ONLY WERE ASKED 3 QUESTIONS, PLEASE COME BACK."
12560 PRINT "WHEN YOU CAN STAY LONGER, BYE."
12570 STOP
12580 PRINT
12590 PRINT, "WHY, "NIX", YOU ARE IN A HURRY TODAY."
12600 PRINT
12610 PRINT, "YOU PROBABLY WILL HAVE TO SPEND MORE TIME"
12620 PRINT "THINKING ABOUT THIS."
12630 PRINT
12640 PRINT, "SORRY I COULD NOT HELP YOU MORE, BYE."
12650 STOP
12660 END
APPENDIX C: Runs
A COMPUTER-PROMPTED INVENTION PROGRAM:
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ARISTOTLE'S TOPICS
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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 'RETURN' OR 'UNDO' KEY. THE 'SHIFT' MUST BE DEPRESSED WHEN YOU 'UNDO'. 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 '44' AND I'LL SAY 'GO ON, HALT.'

(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 (up to I hope!) I'm not guaranteeing the truth, but I'll do the best I can. My memory is still developing.

(PRESS '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.
'THIS ONE IS A LOT OF FUN, HALT.)
44 I'LL LET YOU CONTINUE WITH YOUR RESPONSE.
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?)

I'M GLAD YOU ASKED, WALT. BRIEFLY, THE TWENTY-EIGHT ETHICAL 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.

(NOT '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 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, CESSION 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 'NOW', BUT YOU SHOULD KEEP EXPLORING FOR AN ANSWER.

CONTINUE:

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

"I'M 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.

HATED 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!

RAY.
DO YOU WISH TO NARROW OR CHANGE YOUR SUBJECT?
(MAYBE REVISE THE WAY IT SOUNDS IN THESE QUESTIONS?)
(YES OR NOT)

NO

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

HERE IS QUESTION 3, WALT.

WHAT HAS BEEN DECIDED ABOUT FEAR OF DEATH TO DATE.

EXPLAIN!

DECISIONS HAVE BEEN MADE ABOUT FEAR OF DEATH.
WHAT WERE THEY ABOUT? WHO MADE THEM?

FOR EXAMPLE, IF I WERE WRITING A PAPER ABOUT INFLATION, I COULD WANT TO WRITE A PARAGRAPH OR TWO ABOUT THE GOVERNMENT'S LEGISLATION TO DATE. TRY ANSWERING THIS QUESTION NOW.

CALIFORNIA HAS A NATURAL DEATH ACT WHICH ALLOWS PEOPLE TO INSTRUCT IN THE EVENT OF DEATH TO HAVE THEIR LIFE SUPPORTED.

GO ON, WALT.

SUPPORTING МACHINE

WHO, WALT. ADD TO YOUR RESPONSE NOW.

PEOPLE HAVE HAD VARIOUS ORGANS 'TRANSPLANTED' TO HELP OUTSTANDING. WALT:

YES, BUT I WANT YOU TO KEEP.

WHO?

THE LAST QUESTION
STIMULATING RHETORICAL INVENTION IN ENGLISH COMPOSITION THROUGH—ETC(U)

AUG 79  H L BURNS

END
FANTASTIC, HALT!

REPEAT!

WHAT HAS BEEN DECIDED ABOUT FEAR OF DEATH TO DATE?

RAPID AND QUICKLY HAS TAKEN OFF LIFE SUPPORT EQUIPMENT TO DIE TO RELIEVE HER PAIN OF 44.

GO ON, HALT.

PROLONGING THE LIFE OF A VEGATABLE

HALT.

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

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

DEFINING FEAR OF DEATH.

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

GO ON, HALT.

OUR IMMORTALITY

(HM, HALT. ADD TO YOUR RESPONSE NEXT.)

HURRIE ASKING WHY MOMMY OR DADDY IS NO LONGER WITH US IS SOMETHING WE OFTEN FIND HARD TO COME WITH.

SUPER, HALT!

(ASKING ELSE?)

YES, FEAR OF BEING IN UNUSUAL SURROUNDINGS, AND WHERE WE DON'T KNOW THOSE SURROUNDINGS ARE THE JUST ASK.

HALT?

EXPLAIN:

YOU MIGHT SPEND ALL DAY ON THIS QUESTION, BUT I AM AFTER A SHORT DEFINITION. IN LESS THAN FORTY MINUTES.

WHAT IS FEAR OF DEATH?

YOUR TURN, HALT.
FEAR OF THE UNKNOWN

FANTASTIC! HALT!

FEAR OF PAIN

ANYTHING ELSE?

OHAY.

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

AND HERE COMES A REALLY INTERESTING QUESTION -- NUMBER 9.

WHAT COULD BE CONSIDERED A CAUSE OF FEAR OF DEATH?

WITNESS EXPOSED TO DEATH PROPERLY WHEN WE FIRST EXPERIENCE IT.

GOOD. HALT. ADD TO YOUR RESPONSE NOW.

SEELING SOMEONE DIE IN A TRAGIC INCIDENT

SUER. HALT!

ANYTHING ELSE?

WITNESS EXPERIENCING OUR LOVED ONES TO PLAY WITH THEM AND GO THE PLACES WHERE WE ENJOYED OURSELVES.

WHAT?

EXPLAIN!

THIS QUESTION IS ABOUT CAUSES AND EFFECTS, BUT YOUR ANSWER SHOULD JUST MENTION THE CAUSES. THE REASONS.

FOR EXAMPLE, IF I WERE WRITING ABOUT HUMAN RIGHTS PROGRAMS. I WOULD WRITE SOMETHING ABOUT THE OUTRAGES OUR WORLD HAS WITNESSED.

TRY ANSWERING THIS QUESTION NOW.

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

OHAY!

YES, THAT SEEMS OK.

YOUR TURN. HALT.
CONTINUE!

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

HOW 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 CUNT.

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 SEYON HOSPITAL GAVE A TALK TO MY STUDENTS.

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

I HAVE WORDED MY PEOPLE HAVE SUCH A FEAR OF WHAT THEY DON'T KNOW AND CANT DO SOMETHING ABOUT. LIKE MY FEAR.

GO ON, WALT.

OF SINKING.

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 ARE.

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 EXPLODED 8 QUESTIONS OUT OF THE 9 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 NIGHT & GOOD LUCK!

TIME: 21.90 SECS.
>CLOSE
(CLOSING BASIC.LOG)
A COMPUTER-ASSISTED INVENTION PROGRAM:
----------------------------------------
BURKE'S DRAMATISTIC PENTAD
-----------------------------

GREETINGS! WELCOME TO CAIL-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 HOW 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, ROBIN. 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?

DIFFERENT TEACHING METHODS FOR DIFFERENT CHILDREN.

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

THE WHOLE MODERN DAY PROBLEM OF DISCRIMINATION.

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.

WHY ESPECIALLY CARES ABOUT SEX DIFFERENCES?

EXPLAIN THEIR REASONS.

ALL PEOPLE, BOTH MEN AND WOMEN SHOULD CARE ABOUT SEX DIFFERENCES, BECAUSE THEY ARE ALL 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 1.

DESCRIBE SOCIETY'S ATTITUDE TOWARD SEX DIFFERENCES.

THAT IS A QUESTION TO WHICH I DON'T KNOW THE ANSWER. THAT IS WHAT I TRYING 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 SENIOR SEX AND WOMEN THEREIN.

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 ARE 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 THEM OCCUR MOSTLY IN THE BIG ORGANIZATIONS -- SCHOOLS, WORK, SPORTS.

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

LARGE ORGANIZATIONS HAVE A STRICT RULE SET AND WHEN THESE DONT AGREE WITH MEN OR WOMEN'S 44 GO ON, ROBYN.

VIEWPOINTS, CONFLICT OCCURS

SUPER, ROBYN!

ANYTHING ELSE?

NO, I HADNT THOUGHT 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... DON'T UNDERSTAND THE BIOLOGICAL FACTORS THAT CONTROL MEN AND WOMEN'S ACTIONS, EMOTIONS ETC.

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

PEOPLE NEED TO KNOW HOW MUCH HEREDITY CONTROLS MOTIVATION, INTELLIGENCE, SPECIAL SKILLS

SUPER, ROBYN!

ANYTHING ELSE?

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 ESTABLISH WHETHER DIFFERENCES REALLY EXIST BETWEEN MEN AND WOMEN.

HOW WOULD YOU COMPLETE THIS STATEMENT:

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

THAT YES, DIFFERENCES DO EXIST, AND THAT THESE DIFFERENCES OUGHT TO BE IN OUR OKAY, GOOD. KEEP PURPOSE IN MIND AS WE CONTINUE.

HERE IS YOUR NEXT QUESTION -- NUMBER 6.

WHAT REASONS CAN YOU LIST FOR THE EXISTENCE OF SEX DIFFERENCES?

BIOLOGICAL, HEREDITY, ENVIRONMENTAL, CULTURAL, AND OF COURSE, PLAIN DIFFERENCES.

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

EXPLAIN:

WHY DOES SEX DIFFERENCES DEMAND OUR ATTENTION IN THIS DAY AND AGE? WHAT REASONS CAN YOU GIVE FOR THE IMPORTANCE OF THIS TOPIC?

YOUR TURN, ROBYN.

IT IS AN IMPORTANT TOPIC BECAUSE THE FACTOR OF DISCRIMINATION 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 HAVE 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 DON'T THINK I UNDERSTAND PLEASE EXPLAIN!

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

WHAT ARE YOU THINKING NOW, ROBYN?

OKAY, I DON'T UNDERSTAND PLEASE CONTINUE!

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

NO

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

IS THE SITTING AROUND SEX DIFFERENCES UNIQUE?

WHAT MAKES IT SO?

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

I LIKE YOUR REASONING.

GOOD, ROBYN, ADD TO YOUR RESPONSE NOW.

IT IS ALWAYS TOUCHY BECAUSE PEOPLE GET OFFENDED WHEN YOU START TALKING ABOUT SOMETHING LIKE THIS.

GO ON, ROBYN.

SO BASIC IN THEIR PERSONALITY

SUPER, ROBYN!

ANYTHING ELSE?

NO CONTINUE:

SURE.

(USE GOOD, STRONG, ACTION VERBS WHEN YOU CAN.)
HERE IS QUESTION 9, ROBIN.

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, ROBIN.

SEX DIFFERENCES IS CONSTANTLY AROUND, IMPOSING ON OUR LIVES, POSSIBLY THREATENING SOME PEOPLE.

GOOD, ROBIN, ADD TO YOUR RESPONSE NOW.

IT SEEMS THAT WE, AT LEAST IN AMERICA, ARE CONSTANTLY ANALYSING OUR ROLES IN OUR CULTURAL
GO ON, ROBIN.

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

TERRIFIC, ROBIN!

NO CONTINUE!

ANYTHING ELSE?

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, ROBIN. ADD TO YOUR RESPONSE NOW.
IT SENS THAT SOME OF OUR LAWS ARE STILL PURITANICAL IN REGARDS TO WOMEN'S RIGHTS.

TERRIFIC, RUBY!

ANYTHING ELSE?

TRYING IT AL IN, IF A WOMAN IS ACCUSTED TO BEING SUPPORTED, AND HER HUSBAND IS THE SUPPORTER AL

GO ON, RUBY.

THEN, WHEN AND IF SHE EVER LEFT HIM, THE LAWS AND SOCIETY WOULD HELP HER.

OKAY.

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

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

WHAT CAUSES SEX DIFFERENCES? EXPLAIN.

I TALKED ABOUT THAT EARLIER. I DON'T REALLY KNOW SINCE I HAVEN'T RESEARCHED IT YET AL

GO ON, RUBY.

BIOLOGICAL FACTORS, HEREDITY, CULTURAL FACTORS.

BY GEORGE, RUBY. COULD YOU WRITE A LITTLE MORE PLEASE.

ANOTHER REASON MIGHT BE MENS AND WOMEN'S ACTUAL ATTITUDES TOWARD THE OPPOSITE SEX.

GREAT, RUBY!

NO CONTINUE!

ANYTHING ELSE?

OKAY.

LET'S PAUSE ONCE AGAIN TO CONSIDER YOUR INTENT.

YOUR GENERAL PURPOSE IS TO

TO ESTABLISH WHETHER DIFFERENCES REALLY EXIST BETWEEN MEN AND WOMEN.

ALSO, YOU WANT YOUR READER TO UNDERSTAND

THAT IF'S, DIFFERENCES DO EXIST, AND THAT THESE DIFFERENCES OUGHT TO BE IT IN YOUR.
IS THERE ANOTHER THING 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 IS
GREAT. RORY, WHAT WOULD YOU LIKE TO ADD?
IS IMPORTANT IN THE WHOLE REALM OF HUMAN RELATING
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 4 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, RORY, 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, RORY.

TIME: 14.10 SECS.
Console
CLOSING LOG
(CLOSING BASIC, LOG)
WELCOME TO CAL-PROMPTED EXPLORATION.

PLEASE TYPE YOUR FIRST NAME: RICK

HOW, RICK, PLEASE TYPE 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 TAOGENIC MATRIX?
(YES OR NO?)

YES

THE TAOGENIC MATRIX HEURISTIC:
BRIEFLY, THE TYPHEMIC 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.)

HOW 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 change.

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:
OKAY.

(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 PROCESSOR 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:
OKAY.

DO YOU WISH TO NARROW OR CHANGE YOUR SUBJECT?
MAYBE REWRITE THE WAY IT SOUNDS IN THESE QUESTIONS?
(YES OR NOT)

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.

Okay.

(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 capabilities.

Good, Rick. Add to your response now.

Computers being able to be in the every day home.

Terrific, Rick!

Anything else?
NO

OKAY.

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

LET’S SEE, NOW ABOUT QUESTION 9 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

OKAY.

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 DECISIONS

GOOD, RICK. ADD TO YOUR RESPONSE NOW.

HELP PEOPLE COPE WITH EVERYDAY LIVING

FANTASTIC, RICK! ANYTHING ELSE?

NO.

OKAY.

(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 CAN REALLY THINK

SUPER, RICK! ANYTHING ELSE?

IF COMPUTERS CAN REALLY HELP MAN WITHOUT DESTROYING HIM

OKAY.

DO YOU WISH TO NARROW OR CHANGE YOUR SUBJECT?

MAYBE REVISE THE WAY IT SOUNDS IN THESE QUESTIONS?
(Yes or not)

(If you don't understand, say so, I'll try to help.)

We're moving right along, here is question 6,

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 things.

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 computers 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

OKAY,

(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 CONSTRUCT BECAUSE PEOPLE DID NOT HAVE THE MACHINERY TO BUILD THEM. THAT'S AN INTERESTING REASON.

GOOD, RICK. ADD TO YOUR RESPONSE NOW.

NOW NEW ELECTRONIC EQUIPMENT COMPUTERS ARE BEING BUILT MUCH EASIER.

FANTASTIC, RICK!

ANYTHING ELSE?

NO

OKAY,

(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 US AN EXTRA MUCH TIME BECAUSE THEY WORK VERY FAST.

THAT'S AN INTERESTING REASON.

OUTSTANDING, RICK!

ANYTHING ELSE?
OKAY.

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 NOT?)

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:
E  COMPUTERS  Y
DESCRIBE E AND Y.

TRY ANSWERING THIS QUESTION NOW.

AT ONE END THERE IS THE SCIENTIST WHO USES THE COMPUTER TO HELP HIM AND AT
THE OTHER END 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.

(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:

(HEH, RICK, I'M ENJOYING THIS, KEEP ON 'QUICKIN'!

QUESTION IS -- 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 13. 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

OKAY.

(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 MACHINES BUILT TO HELP HIM BUT SOMETIMES PEOPLE ARENA GO ON, RICK.

AFRAID OF IT TAKING OVER HIM

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 piece of machinery now in existence.

Fine, Rick, write some more,

They can compute problems and make decisions 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 9 particle questions, 1 wave questions, and 6 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: 33.56 secs.

<LOGS
<CLosing BASIC.LOG>
APPENDIX D: Heuristic Handouts
ARISTOTLE'S TOPICS

The questions based upon Aristotle's topics are adapted from his "Topics." 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?

* 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 Marj Burns, 417-3104. His assistant is Ken Kieze, 411-4759 / 471-3334. The computer terminals are located in Perlin 3. Please call if you are unable to keep your appointments. Thanks.
KENNETH BURKE'S DRAMATISTIC PENTAD

The questions based upon the dramatic pentad are derived from Kenneth Burke's Grammar of Motives. The five key terms of the pentad -- act, scene, agent, agency, and purpose -- represent the specific perspectives the dramatist creates in the "attributes of motives." Specifically, Burke contends that "any complete statement about motives will offer scene and all answers to these five questions: what was done (act), where or where it was done (scene), who did it (agent), how he did it (agency), and why (purpose)." Interestingly, many people associate the dramatic pentad with the journalistic pentad, i.e., how, when, where, whom, and why. What ultimately recommends the dramatic pentad is the manner in which the ten possible ratios can be manipulated in order to explore unknowns.

Journalistic Questions

- What is the setting for your subject?
- Is the setting around your subject unique? Any or any 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 or people show 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 Suque Hughes, 413-254.
His assistant is Dan Garcia, 413-253 / 471-3214.
The computer terminals are located in Berlin. If you are unable to keep your appointment, please call. Thanks.
The questions based upon the tactual matrix are derived from Young, Becker, and Pike's tactual discovery and chance. One of their important maxims is "A unit of experience can be viewed as a particle, or as a cause, or as a field. That is the writer can choose to view any element of his experience as a unit which can be seen as a triangle or as a part of a pattern or relationships or part of a larger context." According to Young, tactual 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 Tactual 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 'nonymous, 837-3423. His assistant is Jan Zaitz, 411-4754 / 471-3234. The computer terminals are located in Berlin 3. Please call if you are unable to keep your appointment. Thanks.
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 (837-344).

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**

1. **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.

<table>
<thead>
<tr>
<th>(SA)</th>
<th>(A)</th>
<th>(UN)</th>
<th>(D)</th>
<th>(SD)</th>
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</thead>
<tbody>
<tr>
<td>1. I think freshman college students generally need help with prewriting.</td>
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<tr>
<td>2. It was easier to talk to the computer than it was to talk to my teacher about my topic.</td>
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<tr>
<td>3. If I had another paper to write, I would volunteer for another computer-assisted invention session.</td>
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<td>4. The CAI session is more efficient than the way I usually begin writing a paper.</td>
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<tr>
<td>5. I would like to do the CAI again with my same topic but for a longer period of time.</td>
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<tr>
<td>6. The hardest questions were the best questions.</td>
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<td>7. I think the session will make the actual writing of the paper easier.</td>
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<tr>
<td>8. From experiencing this instruction, I have learned how to generate my own questions.</td>
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<tr>
<td>9. The computer program made me think.</td>
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<tr>
<td>10. A list of all the questions would have helped me just as much as the session itself.</td>
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<tr>
<td>11. The composition plan exercise was useful for helping me make the transition from invention to arrangement.</td>
<td></td>
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<tr>
<td>12. Overall, the computer-prompted invention sequences helped me discover something to say about my topic.</td>
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</tr>
<tr>
<td>13.</td>
<td>I have a better idea about my own system of thinking than I did before experiencing the CAI.</td>
<td></td>
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</tr>
<tr>
<td>14.</td>
<td>The entire experience was useless.</td>
<td></td>
<td></td>
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<tr>
<td>15.</td>
<td>The computer-prompted invention sequences helped me discover two or three ideas which I had not thought about before.</td>
<td></td>
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</tr>
<tr>
<td>16.</td>
<td>The programmed questions were too difficult.</td>
<td></td>
<td></td>
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<tr>
<td>17.</td>
<td>I needed more practice before the final session.</td>
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<tr>
<td>18.</td>
<td>The CAI helped me as far as quantity of information was concerned.</td>
<td></td>
<td></td>
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<tr>
<td>19.</td>
<td>The CAI helped me as far as the quality of the information was concerned.</td>
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<tr>
<td>20.</td>
<td>I had more time to talk with the computer than I could have arranged with my composition instructor.</td>
<td></td>
<td></td>
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<tr>
<td>21.</td>
<td>I liked the way the computer asked me to give more information.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>22.</td>
<td>The CAI helped me discover some things I did not know about my topic but needed to find out.</td>
<td></td>
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<tr>
<td>23.</td>
<td>The lectures and class discussions helped me understand the heuristic.</td>
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<tr>
<td>24.</td>
<td>From experiencing this instruction, I understand how heuristic questions could be applied to lots of topics.</td>
<td></td>
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<tr>
<td>25.</td>
<td>I learned how to systematically begin writing by asking myself specific questions.</td>
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</table>
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

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(Coefficient / (Cases) / Significance)
SELECTED BIBLIOGRAPHY


English, H. M. Linguistic theory as an aid to invention. College Composition and Communication, 1984, 19, 136-140.


Ghose, A. An objective proof of the superiority of computer-assisted instruction. Improving College and University Teaching, 1978, 26, 64-66.


Mann, W. C. Man-machine communication research: Final report. Marina del Rey, California: Information Sciences Institute of the University of Southern California, February 1977. (NTIS No. AD-A037 108)


Odell, L. Question-asking and the teaching of writing. The English Record, 1976, 27, 78-86.


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
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