A COMPARISON OF ADJUNCT COMPUTER-ASSISTED INSTRUCTION AND TRADITIONAL INSTRUCTION FOR TEACHING COUNSELING THEORIES

DISSERTATION

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By

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This study examined differences in achievement over Person-Centered Therapy and Rational-Emotive Therapy taught by adjunct computer-assisted instruction tutorials (CAI) and traditional instruction (TI). Subjects included seventeen undergraduate university Guidance Associates. Nine were randomly assigned to the computer-assisted instruction group and eight to the traditional instruction group.

The Achievement Instrument Over Person-Centered Therapy and Rational-Emotive Therapy was developed by the researcher to measure achievement. Content validity and test-retest reliability were established for the test. Analysis of covariance was utilized to test for differences in achievement gains between the CAI and TI groups. Cumulative university grade point averages and achievement pre-test scores were covariates. The Kolmogorov-Smirnov test was used to determine if the distribution of scores following instruction would be more positively skewed for the CAI group than for the TI group. This effect was expected if CAI was more effective than TI for low ability students.

After adjustment of post-test scores to compensate for the effects of ability and pre-study knowledge, analysis of
covariance failed to show a significant difference between achievement gains of the two groups. Adjunct CAI did not result in significantly more learning than traditional instruction for teaching theories of counseling. The Kolmogorov-Smirnov test showed no significant difference between the distribution of scores for the CAI and TI groups on the pre-test or the post-test. Based on published research and the findings in this study, it was concluded that CAI is at least as effective as TI for teaching low ability students.

At the conclusion of the study persons in the CAI group reported a significantly more positive view of CAI as a learning medium than those in the TI group. CAI group members expressed significantly more involvement in learning than persons in the TI group. It was concluded that adjunct CAI is a viable alternative to traditional instruction for teaching theories of counseling.
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A COMPARISON OF ADJUNCT COMPUTER-ASSISTED INSTRUCTION
AND TRADITIONAL INSTRUCTION FOR
TEACHING COUNSELING THEORIES

It is important that counselors understand various counseling theories and their associated techniques and procedures. More specifically, counselors should be able to demonstrate their understanding of human nature, human development, origins of problem behaviors, assumptions for client change, and methods and techniques based on various counseling approaches (Dameron, 1980).

In Counselor Education, Vocational Rehabilitation, and Counseling Psychology, the practice of counseling is based on a variety of theoretical approaches that explain why people behave, think, and feel the way they do. Counseling theory also provides the rationale for specific interventions to bring about positive changes in the lives of clients in counseling. In order to convey this knowledge, different teaching strategies may be utilized, e.g., traditional methods, or the newer alternative of computer-assisted instruction (CAI).

The traditional method of teaching approaches to counseling involves introducing the theories by means of textbook materials and building on this knowledge in a lecture discussion format. Workbooks, programmed texts and audio-visual aids are frequently used to supplement instruction. These
supplements consolidate learning and link theory and practice.

With traditional instruction there are inherent deficiencies. Rockart and Morton (1975) say that a textbook, as a means of introducing material, suffers from the weakness of linearity. All students are presented with identical material in a lock-step manner. Also, the presentation of material by text is designed to be most comprehensible to the average student which leaves out the many persons toward whom the material is not geared.

The computer is a potential resource for education that need not present material in a linear manner. One of the greatest strengths of the computer is its ability to branch to different program areas. This permits material to be presented which meets individual student needs.

CAI, in its various forms, has been widely utilized in numerous educational areas. Edwards, Norton, Taylor, Weiss, and Dusseldorp (1975) write that CAI has been used in biology, chemistry, mathematics, geography, sociology, statistics, economics, management, physics, psychology, and computer science.

Two ways to apply computer-assisted instruction appear in the literature: primary and adjunct CAI. Atkinson and Gerard (1967) state that tutorials provide all of the instruction within a given area. Teachers may provide enriching activities, but the tutorial system is essentially self
contained and self sufficient. Chambers and Sprecher (1980) refer to this stand-alone variety of computer-assisted instruction as "primary CAI" (p. 332).

The other usage is "adjunct CAI" in which computer-assisted instruction is combined with other teaching modalities (Chambers & Sprecher, 1980, p. 332). CAI is not intended to replace, but to assist and supplement the teacher (Grinstein & Yarmish, 1981; Hausmann, 1979). When it is used in this manner, CAI can be viewed as one among many pedagogical tools (Hallworth & Brebner, 1980; Lavine & Fechter, 1981; Magidson, 1977). Thorndike (1912) writes that personal teaching can do what books and machines cannot. Each should be used for its particular strength. Doerr (1979) states that "the computer by itself can never be as effective as a human teacher; an alliance of the two, however, creates a powerful teaching force" (p. 12). Foltz and Gross (1980) add that "CAI is not intended, designed, or able to replace people. It simply makes the educational process more effective and efficient" (p. 74). Johnson and Plake (1981) make an even stronger statement in writing that CAI may offer the most effective adjunct to regular classroom instruction since the invention of the printing press.

With the utilization of adjunct CAI, less class time would need to be devoted to the presentation of basic concepts and facts that the computer can teach (Ellinger & Frankland, 1976; Rockart & Morton, 1975; Rowell & Van Kirk,
1978). Thus, CAI could be facilitative by taking over the basic and routine teaching and clarifying functions (Huff & Sasscer, 1982). The use of CAI would free the instructor to provide individual assistance and to help the slow learner (Leiblum, 1982). Increased free time would also permit the teacher to enhance his or her own knowledge and to prepare more effective lectures (McCulloch, 1980).

Additionally, CAI could provide the instructor and students with feedback on the level of mastery and indicate areas in which concepts are still unclear or where specific help is needed (Huff & Sasscer, 1982). With this information, instructors could prepare for classes with a prior knowledge of points that need further clarification. Such a supplement to the educational process in Counselor Education would provide more class time for instruction tailored to the assessed needs of students and for demonstration of therapeutic techniques.

Little utilization of CAI in the education of counselors is discussed in the literature. No sources were found which documented its use in the teaching of counseling approaches. As a result, the efficacy of CAI for this purpose is unknown. The use of CAI to teach approaches to counseling could add to the educational process in Counselor Education and related fields. Interactive computer tutorials could introduce basic concepts, perform diagnostic testing over content, and provide remediation in areas of need.
The primary purpose of this study was to determine whether or not adjunct computer-assisted instruction would result in greater knowledge and comprehension of concepts pertinent to Person-Centered Therapy and Rational-Emotive Therapy than would traditional instruction. An additional purpose was to ascertain whether or not lower achieving students benefitted more from adjunct CAI than higher achieving students.

**Review of Literature**

The computer is presently available for use as an educational resource and can facilitate the educational process through the two major areas of computer-managed instruction (CMI) and computer-assisted instruction (CAI) (Hausmann, 1979; Splittgerber, 1979).

With CMI the computer is used to prescribe and control instruction (Roberts & Zirkel, 1971; Rockart & Morton, 1975; Senter, 1981). The computer matches the unique aptitude, achievement level, attitude, and learning pattern of the individual with the variety of available curricula materials. The computer provides an ongoing prescription for learning based on the analysis of student responses.

In CAI the computer itself is used as a medium of instruction (De Laurentiis, 1980). Hicks and Hyde (1973) say that CAI is a teaching process which directly involves the computer in presenting instructional material. Hicks and Hyde also state that CAI may be used in an interactive mode...
to provide and control the individualized learning environment for each student. Edwards et al. (1975), Splittgerber (1979), and Thomas (1979) write that CAI is usually divided into drill-and-practice, simulations, games, problem solving, and tutorial modes. Muiznieks and Dennis (1979) state that computer-assisted test construction (CATC) is also an application of CAI.

In computer-assisted test construction the teacher controls question content while the computer performs all of the mechanical aspects of testing (Muiznieks & Dennis, 1979). CATC systems may consist of large banks of test questions that can be accessed and assembled to provide many different forms of tests. This provides availability of practice tests and allows rapid and accurate feedback to students. Additionally, tests can be readily accessed for item-analysis and revision.

With drill-and-practice, the computer reinforces concepts previously taught by a teacher. It functions much as a worksheet of problem assignments in a traditional class (Hausmann, 1979). Stewart (1979) points out that in many classrooms drill-and-practice activities take up a large portion of instruction time. Ross and Wasicsko (1981) write that presently there is no better vehicle for drill-and-practice than the computer. In the field of music, Prevel (1980) states that drill-and-practice is the most important application of CAI in ear training. Computer drill-and-practice is
also often used in mathematics, chemistry, and physics coursework.

In simulation and gaming the computer provides a laboratory experience which models an experiment or real world situation for the student (Hausmann, 1979). Simulations are designed so the student encounters the effect of variations introduced during the activity. An example of how simulations are used in undergraduate physiological psychology is described by Snyder (1979). Snyder's goals for the simulation were to allow the student to observe principles of system activity, guarantee exposure to various changes within the system, and to integrate information about basic principles of complex models. Thomas and Bozeman (1981) state that computers can safely simulate dangerous events, demonstrate in moments what might normally take years, and can decrease the need for expensive laboratory equipment. Dennis (1979a) writes that simulations are used in such divergent areas as flight training, stock company transactions, science laboratory procedures, machine operations, medical diagnosis, and economic systems.

Games are similar to simulations but include competition between either the student and the computer or other players (Ottman, Killam, Adams, Bales, Bertsche, Gay, Marshall, Peak, & Ray, 1980). Games include a set of rules, strategies for problem solving, and specified goals or desired outcomes. Computer games of various types may be found in economics,
business, management, mathematics, and military training (Dennis, Muiznieks, & Stewart, 1979).

Problem solving involves the use of the computer to answer complex problems that would otherwise be very difficult (Hausmann, 1979). In some cases computer programs solve problems as students input appropriate data. Examples are the use of programs such as the Statistical Package for the Social Sciences (SPSS), Statistical Analysis System (SAS), and Program Evaluation and Review Technique (PERT).

To many people, tutorials are synonymous with computer-assisted instruction (Rockart & Morton, 1975). Thomas and Bozeman (1981) point out that CAI is a more inclusive term, whereas tutorials are a subheading, making it inaccurate to interchange them. In the tutorial mode, the computer is used like a teacher (Hausmann, 1979) and a frequent usage of tutorials is teaching new information or skills (Wager, 1982). Dennis (1979b) writes that a computer tutorial is a simulation of the interaction between an expert teacher and an arbitrary learner. Thomas (1979) states that tutorials are a form of CAI which resemble programmed instructional texts. Tutorials may be simple linear programs in which all students receive identical instruction, or more complex branched programs in which instruction is individualized for each student depending on needs and/or interests. Paragraph material, interspersed questions, and response sensitive display selection are present in branched tutorials.
Many advantages have been cited for computer-assisted instruction over traditional presentation of material. The main advantage is its ability to individualize the learning process (Ghose, 1978; McCulloch, 1980; Paden, Dalgaard, & Barr, 1977; Peters & Johnson, 1978; Schloss & Ball, 1981). CAI is self-paced, allowing students to proceed through instructional material at their own rate (Alpert & Bitzer, 1970; Bork, 1979; Caldwell, 1980a; Chizmar, Hiebert, & McCarney, 1977; Herbert, 1982; Perry & Keyser, 1979; Suppes, 1979; Wassertheil, 1969). This permits students to spend more time on material that is difficult for them, and to move quickly through material they find easy.

The computer can present text material, ask questions over the presentation, and based on the student responses individually tailor subsequent material to meet identified needs (Mosmann, 1980). Rockart and Morton (1975) say that a computer's branching ability "... is uniquely provided by the logical capability of computers and cannot easily be provided another way" (p. 84). If an item is missed and remediation is seen to be needed, it can be provided. Retesting will determine the next step in the process. If test items are correctly answered the student will be moved to the next area of content. This process makes each student's answer meaningful, as the response serves as the basis for decisions regarding later presentations (Schurdak, 1967).
Interactive CAI also offers the advantage of making students active participants in the learning process through frequent questioning over course material (Bork, 1980; Caldwell, 1980a; Johnson & Plake, 1981; Magidson, 1978; Perry & Keyser, 1979). CAI absorbs the learner's attention and encourages his or her involvement in the learning process (Alpert & Bitzer, 1970).

Feedback over the level of mastery of material can be immediately provided with CAI (Bork, 1980). With traditional instruction, students may wait many days before receiving such feedback. With CAI, feedback is not only virtually instantaneous, but frequent (Chizmar et al., 1977; Roblyer, 1981). Hall (1971) points out that "poor" students, who are hesitant to talk in class, get little personal feedback. Bitzer (1973) states that lower ability students may be embarrassed about slowing down classmates, and may receive feedback only two or three times per week. In a typical CAI session the amount of personal feedback received by all students is quite high. Hall (1971) reports that such feedback may occur from 40 to 600 times in a 40 minute CAI lesson. Rosenbaum (1969) writes that CAI provides 10 times as much student interaction as traditional classroom instruction.

Student feedback may include controlled positive reinforcement for items answered correctly (Caldwell, 1980b; Spitler & Corgan, 1979). Feurzeiz, Horwitz, and Nickerson (1981) state that this capability increases motivation in the
learning process. Rogers (1971) says that the computer is the most effective tool available for providing reinforcement contingencies. When items are missed, erroneous understanding can be immediately corrected (Brubaker, 1979). Also, the type of error provides the rationale for specific feedback (Spitler & Corgan, 1979).

Testing thus becomes an active part of the learning process, ceasing to serve solely as a tool for the purpose of grading (Bork, 1980; Lavine & Fechter, 1981). Testing can diagnose difficulties fairly and impartially without threat or embarrassment to the learner. An informal and supportive atmosphere replaces a threatening one where students feel the need to learn out of fear (Anderson, 1981; Bell, 1974). This shift of emphasis changes the focus of testing from evaluation to facilitative learning (Bork, 1980). Sorensen and Kincaid (in Margulies & Eigen, 1962) state that the change from learning motivated by a fear of failure to learning motivated by success tends to be more effective.

Interactive CAI, with its testing and remedial branching, can tailor progression through course material and provide the same high degree of achievement for each student (Bork, 1980). In this way, valuable class time can be spent on more applied areas of instruction rather than on mastery of basic text material.

A number of studies are reported in the literature which attempt to establish the effectiveness and efficiency of computer-assisted instruction in various educational areas.
Chambers and Sprecher (1980) write that well designed and tightly controlled studies on the effectiveness of CAI are rare, while Magidson (1978) states that studies comparing CAI with traditional instruction are conflicting and inconclusive. Thomas (1979) extensively reviewed CAI studies. He writes that achievement gains of CAI over traditional methods were the norm.

Culp and Castleberry (1971) used CAI tutorials plus drill-and-practice as supplements to traditional instruction in organic chemistry. The experimental group received CAI in addition to traditional instruction (TI), while the control group received only TI. On five tests covering course material, students in the experimental group scored significantly higher than students in the control group. There was no significant difference in test scores over material not covered by the CAI. The authors concluded that CAI is an effective supplement to TI in chemistry.

Instruction in the utilization of library resources at the University of Illinois was provided for introductory biology students (Williams & Davis, 1979). Students in the experimental group completed computer tutorials and those in the control group learned by traditional instruction. The CAI group had a significantly higher achievement level than the TI group.

Tsai and Pohl (1977) taught computer programming to three groups of university students. One group received TI,
a second CAI only, and a third TI plus CAI. The authors found no differences among the groups on homework assignments or term projects, but a significant difference was found on hour quiz and final exam scores which favored the CAI group and TI plus CAI group. There was not a significant difference between the groups using CAI. Tsai and Pohl state that CAI and CAI plus TI are at least as effective as traditional instruction in learning computer languages. They point out, however, that the Hawthorne effect may have influenced the scores of the CAI groups.

Data processing was taught to university sophomores and juniors in a CAI study conducted by Rota (1982). Two intact classes were assigned to each of the instructional modalities: TI, primary CAI, and adjunct CAI. There was not a significant difference in achievement among the three teaching modalities. The researcher states that primary and adjunct CAI are at least as effective as traditional instruction in teaching data processing.

In Rota's study different instructors were assigned to teach classes. A significant difference was found between teacher effect and student achievement. Rota says that teacher attitude toward CAI may affect student achievement.

In another computer science study Lasoff (1981) taught the programming language, Basic, to groups of undergraduate students. The main focus of the study was to investigate feedback modalities in CAI and programmed instruction (PI);
however, a simultaneous area of investigation was the relative efficacy of CAI and PI. Students were randomly assigned to the experimental and control groups where they received five sessions of instruction. No significant difference in achievement was found between the CAI and PI groups.

Lasoff also found that feedback which indicated the correctness of responses to CAI test items was superior to conditions which provided either no feedback at all, or feedback personalized by including the student's name. This difference reached the level of significance for both CAI and PI.

Other research in which computer science coursework was taught by CAI includes a study by Montanelli (1979). He found no difference in achievement between adjunct CAI and traditional instruction in teaching the computer language, Fortran. Similarly, Dershimer (1981) taught computer flow charting techniques by primary CAI, adjunct CAI, and TI. No significant differences in effectiveness were found among the teaching modalities.

Health sciences provided a teaching focus for several studies attempting to establish the efficacy of CAI. Computer tutorials covering first aid for health education students were developed by the University of Illinois. Rubinson and Robinson (1977-1978) report on a pilot study in which a control group was taught first aid by traditional instruction, and an experimental group by CAI. Analysis of post-testing over the course material revealed no significant
difference between the two groups. The time used to learn the material, however, was 50% less for the CAI group. As a result of the time savings, new courses in first aid were added which allowed increases in enrollment. Attitude surveys indicated that students preferred CAI over traditional methods when dealing with didactic instruction. In a final report covering utilization of 15 computer tutorials on first aid, the effectiveness of CAI continued to be equivalent to TI (Rubinson & Warner, 1979-1980). Attitudes toward CAI also remained positive. The only difference was in terms of efficiency. Rather than a 50% savings in teaching time, a 60% time savings was realized in the final study.

Four other CAI studies in health sciences were found in the literature. Tira (1977) found that CAI was significantly better than traditional instruction in teaching a dental classification system. Sorlie and Essex (1979) conducted two studies in basic medical science. In the first, adjunct CAI users scored significantly higher than students taught by TI on a regularly scheduled course examination. In the second study the adjunct CAI group mean was higher than the TI group mean, although the difference did not reach significance. Boettcher, Alderson, and Saccucci (1981) found no differences in the effectiveness of CAI and printed programmed instruction in teaching aspects of psychopharmacological nursing.

At the University of Kansas Medical Center CAI was used in pharmacology as a supplement to traditional classroom
instruction (Rubin, Knetsch, & Rosenblatt, 1976). CAI could be used at the discretion of students and its usage was monitored by the computer. At the conclusion of the semester utilization rates were compared with course grades. The authors found that frequent CAI users achieved higher overall course grades. This result was achieved even though this group was of lower ability, as indicated by grade point averages and MCAT scores. The authors suggest that lower ability students be encouraged to use available CAI materials to increase their achievement levels.

Chizmar et al. (1977) reached a different conclusion when they studied the use of CAI as a supplement to regular instruction in macroeconomics. Participants in the study had the option of using CAI as a supplement to traditional instruction. The Test of Understanding in College Economics (TUCE) was administered as a course pre-test and post-test. Students who used CAI scored only slightly higher than non-CAI users on the post-test. This difference was offset because students with high GPA's chose to use CAI more often than poorer students. The authors concluded that the students who used CAI scored better than non-CAI users in spite of, rather than because of, supplementary instruction.

Three other studies in the literature also address the issue of student ability and achievement with CAI. Abboud (1972) found adjunct CAI to be superior to programmed instruction and language laboratories in teaching the Arabic
language. As the CAI group scores had the smallest standard deviation, Abboud writes that adjunct CAI allows slower students to catch up with the rest of the class. Arnett (1976) conducted a study which compared the effectiveness of primary CAI tutorials with traditional instruction in accounting. No overall differences in achievement were found between the two groups, and lower ability students, as determined by SAT scores, appeared to benefit equally from computer-assisted instruction and traditional instruction.

Jamison, Suppes, and Wells (1974) write of a CAI experiment in which three groups of students received instruction in physics. One group received all material by CAI, a second by traditional instruction, and a third received TI plus a computerized examination review. The mean scores for midterms, final examinations and course grades showed no significant differences among the groups. A Kolmogorov-Smirnov test showed that the distribution of scores of the primary CAI group differed significantly from the TI and TI plus computer review groups. The CAI tutorial group received fewer low grades than the TI group, leading the authors to state that "CAI seemed to truncate the distribution of lower grades" (Jamison et al., 1974, p. 50). They concluded that primary CAI may improve achievement scores, particularly for disadvantaged students.

Adjunct CAI and traditional instruction were used to teach introductory college physics at Western Michigan
University (Liu, 1975). Subjects who participated in the study completed pre-tests and post-tests over course material. The pre-test was used as a covariate in the statistical analysis. Analysis of covariance showed a significant difference in achievement which favored the CAI group. Liu concluded that CAI is a justifiable alternative to traditional instruction for teaching physics.

A series of experiments with CAI, programmed text, and traditional instruction in descriptive statistics is reported by Tsai and Pohl (1980-1981). The first experiment failed to show a significant difference in achievement between students taught solely by CAI and those who completed programmed texts, written homework assignments, and attended traditional instruction sessions. In the second study one group of students received instruction by means of CAI and participated in discussion sessions (CAI plus group). The other group received TI and completed programmed text materials and written homework assignments. On a multiple-choice achievement test the CAI plus group scored significantly higher than the TI group. On a problem oriented test the CAI plus group scored higher than the TI group, although this difference did not reach significance. On a multiple-choice retention test six weeks later, the CAI plus group scored somewhat, though not significantly, higher than the TI group.

In the final experiment in this series by Tsai and Pohl the following teaching modalities were compared: TI only,
programmed instruction only, PI plus TI, CAI only, and CAI plus TI. Based on a multiple-choice achievement test, the researchers found that CAI only, PI plus TI, and CAI plus TI were the most effective strategies. There were no significant differences among these modalities. A problem test was also administered to each of the students in the study. There was no significant difference between the PI plus TI and CAI plus TI groups; however, both of these modalities were significantly better than the other teaching/learning strategies. When the multiple-choice and problem tests were combined, the CAI plus TI group mean was significantly higher than that of any of the other groups. The authors note that on a practical level the CAI plus TI group scored almost 10 points higher than any other group.

Tsai and Pohl state that CAI and TI can be effectively combined. The result is a teaching/learning environment which will produce significantly higher achievement test scores than any of the other environments investigated. Additionally, they write that the experiments "... demonstrate the importance of close student/teacher interaction in conjunction with the effectiveness of the CAI presentation" (Tsai & Pohl, 1980-1981, p. 126).

Typewriting instruction provided the focus for a study by Wolcott (1976). Twenty-two persons received instruction by traditional instruction and the same number received instruction by computer tutorials. Achievement was measured
by a five minute timed-writing and by production of a manuscript. Results of the study were mixed. Students in the traditional instruction group performed significantly better than the CAI group on timed typewriting, while there was no difference between the two groups in manuscript production. In terms of learning efficiency, however, the CAI group took less instructional time to meet the minimum class objectives.

Research and statistics were taught in several CAI studies. Forsythe and Freed (1979) taught biostatistics by adjunct CAI, programmed instruction, and traditional instruction. Post-testing revealed no significant differences among the group means. Chase (1982) also found no difference between group post-test means when he taught research principles by programmed instruction and CAI. Significant differences favoring adjunct CAI over traditional instruction were found when Johnson and Plake (1981) taught analysis of variance techniques to undergraduate statistical methods students. Participants in the study also indicated a preference for CAI over written text material.

Conkright (1982) reports that United Airlines has been using CAI to train newly hired pilots since January, 1978. After 15 months of operation the airline determined that training time had been shortened from 28 days for conventional training to an average of only 9 1/2 days by CAI. The corporation estimated that by using CAI it saved $175,000 in one year. Also, the airline reports that pilots are well
trained and successfully meet all job requirements. United and American Airlines are both preparing CAI for pilots who will fly the new Boeing 767.

Since 1974 the Federal Aviation Administration (FAA) has been investigating the use of computer based training which combines computer-assisted instruction and computer-managed instruction (Buck, 1982). CAI replaced traditional classroom instruction in several courses in 1981. CAI plus textbooks and audio-visual resources were placed in remote training areas where no professional instructor was available. One-third less time was needed to complete the course by CAI than with traditional instruction, and all students completed subsequent courses with no difficulty. Buck states that the FAA should replace a substantial portion of its current classroom work with computer-based training because it is more efficient and effective than traditional instruction.

Gadzella (1980) reports on basic study skills taught by CAI. Undergraduate students were randomly assigned to treatments as follows: traditional classroom instruction, CAI modules, and no instruction. The Survey of Study Habits and Attitudes was administered at the beginning and conclusion of the study. Students who received instruction by CAI reported significantly better attitudes, habits, and behaviors than members of the other groups.

Cartwright, Cartwright, and Robine (1972) taught students to identify children's handicapping conditions by
computer-assisted instruction and traditional instruction. Both graduates and undergraduates were represented in the study. The CAI group scored significantly higher on the post-test than the TI group. Additionally, the CAI group completed the course in 33% less time than the TI group, which indicates that CAI is more efficient than traditional instruction. The authors concluded that CAI is a valuable educational tool. They state that the higher achievement scores were due to individualization of instruction, as each student interacted over 1,100 times with the computer. They also write that students benefit from continual evaluation and feedback from computer tutorials.

In the field of Counselor Education only one study was found in which CAI tutorials were used. Undergraduate guidance associates served as subjects in a study which compared the relative effectiveness of three modes of instruction: Ivey's video-tape based Microcounseling Training, regular classroom instruction, and video-taped Microcounseling Skills Training plus CAI (Hamm, 1976). Achievement was measured by the Carkhuff Communication Assessment Index, Carkhuff Discrimination Assessment Index, and Hamm Index for Identification of Verbal Communication Skills. These instruments assessed communication, identification, and discrimination of counseling verbal skills. Post-testing revealed no significant differences among the three groups on any of the measures.
Several CAI research reviews appear in the literature. Fletcher, Suppes, and Jamison (1972) reviewed 16 CAI studies conducted at various educational levels. Nearly all of these studies showed gains for CAI which reached significance over traditional instruction. Where gains were not significant, CAI still resulted in higher achievement scores than TI. The review revealed strong and consistent achievement gains when students received CAI for a full semester. The authors concluded that carefully developed and properly used CAI can provide effective educational results.

Edwards et al. (1975) conducted a review of computer-assisted instruction research. All studies in the review showed that adjunct CAI was superior to traditional instruction alone. When CAI was used as a substitute for traditional instruction nine studies showed CAI to produce higher achievement, eight demonstrated little difference, and three produced mixed results. CAI was at least as effective as individual tutoring, language laboratories, programmed instruction, and filmstrips. Additionally, less time was required to master course material with CAI than with alternate forms of non-traditional instruction.

Dence (1980) reviewed 11 CAI studies to evaluate computer-assisted instruction's effectiveness and efficiency. Linear, or non-branched CAI, was found to be less effective than branched versions of the same programs. Dence concluded that individualization through branching was responsible for increased program effectiveness. Students who received
feedback from questions in the tutorial had higher post-test gains than students not receiving feedback.

Dence also discusses efficiency, the relative time needed to master material. CAI was found to be more time efficient than traditional instruction. In the studies reviewed, CAI required 33% to 50% less time than traditional instruction. Also, Dence concluded that persons who had used CAI tended to have a positive view of computer-assisted instruction. Additionally, students with CAI experience had a more positive attitude toward learning by computer than did persons who had not utilized this medium of instruction.

Kulik, Kulik, and Cohen (1980) reviewed 59 published CAI studies conducted at the college level. Meta-analysis was used to compare outcomes of studies which met the author's guidelines. The guidelines included a lack of severe methodological flaws, the use of similar experimental and control groups, and quantification of outcomes. This review revealed a small but significant difference favoring CAI over traditional instruction. Achievement was raised an average of three percentage points. Additionally, no significant difference in effectiveness of CAI was found among students in high, average, or low ability ranges. Meta-analysis also showed that material was taught in 33% less time by CAI than by traditional instruction.

Conflicting evidence is reported in the literature regarding the effectiveness of CAI. Hausmann (1979) concluded
that tutorial and drill-and-practice modes are effective learning tools warranted in education. Splittgerber (1979) disagreed by stating that research evidence is not conclusive enough to justify the widespread utilization of computers for classroom instruction.

The problem of interpreting the research is complicated because published studies provide little detail on instructional treatment (Anver, 1978; Salomon & Clark, 1977). For example, an article may discuss a CAI experiment but not specify whether the computer-assisted instruction was drill-and-practice, tutorial, simulation, computer-assisted testing, or a combination of approaches.

Much of the literature does not permit the quality of instruction used in the studies to be examined. Differences in the quality of treatment group presentation could influence experimental results. Also, variations in emphasis on specific content areas could affect experimental outcomes.

Two general types of computers are used to present CAI. One type is a time-sharing system in which several terminals connect with a central processing unit. The second type is the self-contained, independently functioning microcomputer. Many published studies do not identify the type of computer used and the problem of equipment malfunction is only infrequently mentioned. When a time-sharing system is utilized an equipment malfunction can affect all terminals simultaneously, while microcomputers operate independently of one
another (Cavin, Cavin, & Lagowski, 1980). Hawkins (1979) reports that during a study conducted at various community colleges in Illinois, the time-sharing computer was inoperative for about 50% of the time. The resulting frustration would likely affect student attitudes and achievement.

Rota (1982) investigated the effect of instructor attitude on achievement with computer-assisted instruction. The researcher found that instructor attitudes can significantly affect the outcome of CAI and traditional instruction studies. This intangible, yet important factor, is not addressed in the majority of the published research.

Replicating studies or designing research based on the findings of others is made more difficult by the absence of detail in the literature. Specific reasons for obtained results are frequently difficult to identify. It appears that reasons for the outcome of many studies can only be ascertained by direct communication with the researcher.

In summary, this review of the literature on CAI effectiveness research has shown conflicting results. CAI was found to be significantly more effective than traditional instruction in 40% of the studies reviewed. Although not reaching the level of significance, 10% of the studies found higher post-test scores for computer-assisted instruction than for traditional instruction. The two teaching approaches were about equally effective in 47% of the studies. Traditional instruction was found to be more effective than computer-assisted instruction in 3% of these studies.
Six sources in this review examined the relationship between student ability and CAI achievement. Three studies showed CAI to be more effective with lower achieving students, while two experiments showed no relationship between ability and achievement with CAI. One author, who reviewed published studies, concluded that slower students were not helped more by CAI than by TI. The efficiency of CAI was addressed in five of the studies. Less time was required to learn material by computer-assisted instruction than by traditional instruction in all of these experiments. Reported time savings ranged from 33% to 66% when computer-assisted instruction was used.

Computer-assisted instruction was found to be at least as effective as traditional instruction in various fields of education. Although results are conflicting, CAI has been shown to benefit low ability students. No studies were found in the literature which assess the efficacy of CAI in teaching approaches to counseling. Research in this area is needed and provides the focus for this study.

**Research Questions**

The following research questions were posed for this study.

1. Will adjusted post-test scores on an achievement instrument covering Person-Centered Therapy and Rational-Emotive Therapy be significantly higher for students taught
by adjunct computer-assisted instruction than for students taught by traditional instruction?

2. Will the distribution of post-test scores be significantly more positively skewed for students taught by adjunct computer-assisted instruction than for those taught by traditional instruction?

Method

Subjects

Subjects for this study were recruited from a senior level Guidance Associate class at a state university during the Fall Semester of 1982. All class members were encouraged to participate; however, no inducements were offered to individuals who volunteered. Students were allowed class time to complete all assigned materials. An outline of the study was presented verbally to the class and students wishing to participate signed an informed consent form. A copy of the form is in Appendix A.

Seventeen students volunteered to participate in the study. Fifteen reported being classified as seniors and two reported being juniors. The mean age of student volunteers was 24.5 and ranged from 20 to 45 years.

The dissertation proposal review committee evaluated the effects of this study on human subjects. The committee ascertained that this study conforms to the guidelines of North Texas State University's Human Services Review Board. A copy of the form filed with the Board is in Appendix B.
Instruments

Nunnally (1959) writes that the purpose of an achievement instrument is to measure accomplishment in a course of training or unit of instruction. In this study an achievement instrument was used to measure learning. As no validated test over Carl Rogers' Person-Centered Therapy and Albert Ellis' Rational-Emotive Therapy was found in the literature, an instrument was developed covering these theories for use in this study to measure student achievement.

The researcher developed an item bank of 35 questions over each of the two theories used in this study. Twenty proposed items were taken from the Instructor's Resource Manual for Theory and Practice of Counseling and Psychotherapy, Second Edition (Corey, 1982a). Five were from the Instructor's Manual for Fundamentals of Counseling, Second Edition (Shertzer & Stone, 1974). The other ten items were developed by the researcher.

Proposed items were selected to assess both knowledge and comprehension (Bloom, 1954). Additionally, items were representative of logical subtopics of each theory. Items for each counseling approach were chosen based on the following major divisions outlined in Theory and Practice of Counseling and Psychotherapy, Second Edition (Corey, 1982c): introduction to the theory, view of human nature, therapeutic goals, function and role, client's experience in therapy, relationship between therapist and client, therapeutic techniques and procedures, and summary and evaluation.
Anastasi (1968) and Nunnally (1970) state that achievement tests require content validation, or what Mitchell (n.d.) calls curricular validity. Kerlinger (1964) writes that content validation establishes the adequacy of test items to measure the property being investigated. Kerlinger also states that to establish content validity for an instrument "alone, or with others, one judges the representativeness of the items" (1964, p. 458).

Content validation was established for the achievement instrument used in this study. A panel of five authors in the area of counseling theory served as jury members. Jury panel members are listed in Appendix C.

Instructional content used in this study was from Chapter Five, "Person-Centered Therapy," and Chapter Nine, "Rational-Emotive Therapy" found in Theory and Practice of Counseling and Psychotherapy, Second Edition (Corey, 1982c). Photocopies of these two chapters were provided to each jury panel member. The panel was also given the 35 proposed test items covering each counseling approach. Permission for use of Corey's works (1982a, 1982b, & 1982c) was granted by the publisher. A copy of this permission letter is found in Appendix D.

Jury members were asked to rate each proposed test item as to its adequacy and accuracy in representing the content material. Responses by jury members were either "yes," the item has adequate content validity, or "no," the item does
not have adequate content validity. Only items receiving three or more "yes" responses were retained for use in the achievement instrument. Thirty items over Person-Centered Therapy and 35 items over Rational-Emotive Therapy were validated for use in the test. The validated instrument, called the Achievement Instrument Over Person-Centered Therapy and Rational-Emotive Therapy, and correct responses to items can be found in Appendix E. Appendix E also denotes the origin of specific test items.

Following content validation, reliability was established for the instrument. Nunnally (1959) writes that reliability is "precision of measurement" (p. 95). Cronbach (1960) states that a test may measure the achievement of students who are at one level reliably, while students who are at a different level may or may not be reliably measured by the same instrument. Therefore, reliability should be established with a group similar to the instrument's target population.

Because the subjects for this study were enrolled in a senior level Guidance Associate class at a state university, reliability was established using junior's from the same program. Roscoe (1975) writes that reliability for achievement instruments can be established by the test-retest method. Gay (1980) states that a seven day time period between initial testing and retesting is acceptable for establishment of test-retest reliability.
Early in the Fall Semester of 1982, the initial test was administered to the junior level Guidance Associate class. Seven days later the retest was administered. No mention of the retest procedure was made to the students to ensure a more accurate reliability measurement. Twenty-seven students completed the test and retest. The Pearson product moment coefficient of correlation, to determine the level of reliability, was computed by an SPSS computer program (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975). A correlation of .80 was established between the test and retest which is equal to the level Nunnally (1959) states is acceptable for achievement instruments.

The CAI/Traditional Instruction Questionnaire was developed by the researcher for anonymous completion by participants in the study. A copy of this questionnaire can be found in Appendix F. The instrument was used to assess the following: completion of CAI or reading assignments, presence of outside instruction, attitude toward CAI prior to and following the study, involvement in learning, and preference for group assignment. No validity or reliability data are available for this instrument.

Procedure

The present research used a pre-test post-test control group true experimental design. Students who received adjunct CAI (computer-assisted instruction plus lecture
discussion) comprised the experimental group. Persons who received traditional instruction (written text material plus lecture discussion) composed the control group.

During the first week of the Fall Semester, 1982, 17 students were recruited to participate in this study. Random assignment of subjects to the experimental (CAI) and control (TI) groups was accomplished with the aid of a table of random numbers found in Roscoe (1975). Nine subjects were assigned to the experimental group. Eight were female and one was male. Seven reported being classified as seniors and two reported being juniors. The mean age for this group was 26.56 and the ages ranged from 20 to 45 years. The control group was composed of eight persons. Seven were female and one was male. All members of the control group reported being classified as seniors. The mean age for the control group was 22.25 and ranged from 21 to 27 years.

The week after being recruited all students in the class, whether participants in the study or not, were administered the pre-test. The Achievement Instrument Over Person-Centered Therapy and Rational-Emotive Therapy was used as the pre-test measure and was administered in the students' classroom at the regularly scheduled class time. Following completion of the pre-test all students in the class were told that they would be assigned readings or computer tutorials over Person-Centered Therapy. They were instructed to be prepared to participate in a lecture discussion over the
material at the regularly scheduled class meeting one week later. Students in the control group, as well as non-participants in the study, were given self scoring study tests over Person-Centered Therapy and photocopies of Chapter Five, "Person-Centered Therapy," from Theory and Practice of Counseling and Psychotherapy, Second Edition (Corey, 1982c). The Person-Centered Therapy Self Study Quiz may be found in Appendix G. Items on the study test were identical to those used to control branching in the experimental group's computer tutorials.

The experimental group was taken to the Department of Education's Learning Resource Center where instruction was given in accessing the Rogers computer tutorial. They were told that the tutorial over Person-Centered Therapy would require approximately one hour to complete. The option was given to complete the tutorial at that time, or to return during the ensuing week to complete the assignment.

During the third week of the study a lecture discussion on Person-Centered Therapy was led by the instructor assigned to teach the class. This session lasted approximately one hour. Following the instruction, members of the control group and non-participants in the study were given self scoring study tests over Rational-Emotive Therapy (RET) and photocopies of Chapter Nine, "Rational-Emotive Therapy," from Theory and Practice of Counseling and Psychotherapy, Second Edition (Corey, 1982c). A copy of the Rational-Emotive
Therapy Self Study Quiz is in Appendix H. Items on the RET study quiz were used to control branching in the experimental group's computer tutorial on Rational-Emotive Therapy. All students were told to be prepared to participate in a class discussion on RET the following week. Members of the experimental group were taken to the computer area and instructed in the use of the computer to access the tutorial over Rational-Emotive Therapy. Again they were given the option of completing the tutorial at that time, or making arrangements to complete it later.

At the regular class meeting during the fourth week of the study a lecture discussion over Rational-Emotive Therapy was held for all class members. The session lasted approximately one hour and was conducted by the instructor who led the lecture discussion on Person-Centered Therapy.

During the fifth week of the study all students in the class, whether or not they were participants in the study, were administered the unannounced post-test. The post-test was identical to the pre-test. Only the tests of students volunteering for this study were retained for use in data analysis.

After all students completed the post-test, participants were asked to anonymously complete the CAI/Traditional Instruction Questionnaire. The questionnaire requested the participant's group assignment, asked whether assigned material had been studied, asked if other material over the
theories used in the study had been covered, and assessed attitudinal variables.

Following the study, members of the experimental group were provided handouts identical to those given to the control group. Members of the control group and non-participants were instructed in accessing the computer tutorials used by the experimental group. In this way all of the students in the class were given equal access to all instructional materials used in the study.

**Instruction**

The experimental group received instruction over counseling approaches by means of adjunct CAI tutorials. Tutorials were displayed by an Apple microcomputer on a cathode ray tube. The system permits presentation of text material, testing, and remediation based on responses to questions in the computer-assisted instruction. Students who wished to review sections of text material were able to do so.

The two tutorials were developed largely verbatim from Chapter Five, "Person-Centered Therapy," and Chapter Nine, "Rational-Emotive Therapy," from Theory and Practice of Counseling and Psychotherapy, Second Edition (Corey, 1982c). Changes were made only to break up long sentences and to allow computer presentation of diagrams. In this way equivalent instruction was provided to members of both groups.

Development of computer tutorials was based on research findings and recommendations from the literature. Schurda...
(1967) writes that branched computer-assisted instruction makes each student's responses meaningful, because decisions for tutorial presentations are based on the learner's answers. Dence (1980) states that branched CAI produces significantly more learning than linear versions of the same program. Both tutorials in this study utilized adaptive branching to better meet student needs through individualization of instruction.

Dence (1980), Cartwright et al. (1972), and Lasoff (1981) concluded that students benefit from evaluation and feedback when using computer-assisted instruction. Lasoff also found that feedback which indicated the correctness of responses was superior to feedback which was personalized by stating the student's name. In this study CAI tutorials presented short sections of content followed by true-false and/or multiple-choice items. Non-personalized feedback was provided following the student's response to each question.

Brubaker (1979) writes that erroneous understanding can be corrected by feedback on responses to test items. Spitler and Corgan (1979) add that the type of error made on questions provides information for specific feedback to the student. In the present study, when misunderstanding of content was identified by tutorial questions, the computer branched to a section that addressed the specific student response. For incorrect responses an explanation was given why, based on the counseling theory, the response was incorrect. Two
opportunities were allowed on multiple-choice items, while only one answer was permitted on true-false questions. If the student failed to answer the question correctly, the proper response with its rationale was displayed.

Caldwell (1980b) and Spitler and Corgan (1979) suggest the use of controlled positive reinforcement in computer-assisted instruction. In this study a correct answer to a tutorial question was followed by a positive statement such as "good job" or "you got it right on the first try." The reinforcing statement was followed by the reason, based on counseling theory, that the response was correct.

After the question sequence the student was given the option of reviewing the preceding text material upon which the question or questions were based. The student then proceeded to the following text and question series. In this manner the student progressed through the individualized program.

At the conclusion of each tutorial, questions answered incorrectly on the first attempt were reviewed for the student. The review was provided to better ensure correct understanding of concepts represented in questions that were not answered correctly. For each of the items missed, the question, the student's response or responses, and the correct answer to the item were displayed.

Members of the traditional instruction group studied photocopied handouts of Chapter Five "Person-Centered
Therapy," and Chapter Nine, "Rational-Emotive Therapy," from Theory and Practice of Counseling and Psychotherapy, Second Edition (Corey, 1982c). These readings were supplemented by self scoring study tests over each theory.

Members of both the experimental and control groups were given lecture discussion over Person-Centered Therapy and Rational-Emotive Therapy. Instruction was provided by the professor regularly assigned to teach the Guidance Associate class. To aid in the preparation of lecture discussion sessions the instructor was given copies of the pre/post-test, self scoring study tests, and copies of the chapters photocopied for the TI group.

Results

Research question one asked if adjusted post-test scores on an achievement instrument covering Person-Centered Therapy and Rational-Emotive Therapy will be significantly higher for students taught theories of counseling by adjunct computer-assisted instruction than for students taught by traditional instruction. This research question was tested by analysis of covariance. Pre-test scores and cumulative university grade point averages were used as covariates. Gain scores were adjusted to compensate for prior knowledge of the theories, as measured by the pre-test, and for ability, as reflected by grade point averages.

The high, low, mean, and standard deviation of grade point averages for the CAI and TI groups are presented in
Table 1. Grade point averages were computed based on the university's 4.0 system.

Table 1

<table>
<thead>
<tr>
<th>Group</th>
<th>High</th>
<th>Low</th>
<th>Mean</th>
<th>S D</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI</td>
<td>4.00</td>
<td>2.41</td>
<td>3.12</td>
<td>.53</td>
</tr>
<tr>
<td>TI</td>
<td>3.54</td>
<td>2.32</td>
<td>2.93</td>
<td>.42</td>
</tr>
</tbody>
</table>

Achievement instrument pre-test scores were also utilized as covariates. A statistical summary of pre-test, post-test, and adjusted mean scores for each group is shown in Table 2. Computations were made based on raw-scores, or the number of items answered correctly. The maximum possible score was 65.

Table 2

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Pre-Test Mean</th>
<th>S D</th>
<th>Post-test Mean</th>
<th>S D</th>
<th>Adjusted Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI</td>
<td>9</td>
<td>34.33</td>
<td>9.35</td>
<td>45.89</td>
<td>7.10</td>
<td>44.10</td>
</tr>
<tr>
<td>TI</td>
<td>8</td>
<td>29.38</td>
<td>6.59</td>
<td>40.38</td>
<td>10.46</td>
<td>42.39</td>
</tr>
</tbody>
</table>

Analysis of covariance was used to test for significance between the CAI and TI adjusted group means. Computations were completed by a BMDP analysis of covariance computer
program (Dixon, 1981). The .05 level was used to test for the significance of difference. Results of analysis of covariance are shown in Table 3.

### Table 3

Analysis of Covariance Comparing Achievement Gains on the Achievement Instrument Over Person-Centered Therapy and Rational-Emotive Therapy

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares (Adjusted)</th>
<th>DF</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>11.196</td>
<td>1</td>
<td>11.196</td>
<td>.27</td>
<td>.609</td>
</tr>
<tr>
<td>Within</td>
<td>529.780</td>
<td>13</td>
<td>40.752</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adjusted gain scores for the two groups yielded an F-ratio of .27 with a probability of .609; therefore research question one is not supported.

Research question two asked if the distribution of post-test scores will be significantly more positively skewed for students taught by adjunct computer-assisted instruction than for students taught by traditional instruction. Siegel (1956) states that the Kolmogorov-Smirnov test may be used to determine if two sets of scores have the same distribution. The maximum difference (D) between two cumulative frequency distributions is used to determine if the two sets of scores come from the same population. Siegel also says that the Kolmogorov-Smirnov test is especially sensitive for use with small sample sizes, as were used in this study.
Statistical calculations for the Kolmogorov-Smirnov two-sample tests were made with a Statistical Package for the Social Sciences program (Hull & Nie, 1981). The Kolmogorov-Smirnov tests were computed using pre-test and post-test data. The results of the Kolmogorov-Smirnov for the pre-test can be seen in Table 4.

<table>
<thead>
<tr>
<th>Test</th>
<th>D</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>-.4306</td>
<td>.886</td>
<td>.206</td>
</tr>
<tr>
<td>Post-test</td>
<td>-.2917</td>
<td>.600</td>
<td>.432</td>
</tr>
</tbody>
</table>

The maximum difference (D) between the cumulative frequency distributions for the CAI and TI group pre-tests is not significant at the .05 level; therefore the sample scores on the pre-test can be thought of as coming from the same population. A negative value for D indicates that the cumulative frequency distribution of pre-test scores for the TI group rose faster than those of the CAI group.

The maximum difference (D) between the two group's post-test cumulative frequency distributions is not significant at the .05 level. Post-test scores from the CAI and TI groups can be thought of as coming from the same population. Research question two is not supported.
Related Findings

The CAI/Traditional Instruction Questionnaire was completed by each member of the CAI and TI groups immediately following the post-test. The instrument was answered by participants anonymously to encourage truthful responses. The purpose of the questionnaire was to identify factors that may have influenced achievement test results and to assess attitudes toward certain aspects of the study and toward computers.

Subjects indicated on the questionnaire whether they were assigned to the CAI or TI group, and group membership was used for analysis of responses to other items on the questionnaire. Fisher's Exact Test was used to analyze the responses to questions 2, 3, and 4. According to Leach (1979), Fisher's Exact Test is an appropriate statistic to use with nominal level data for independent groups and for use with small sample sizes. It is a test that is useful in cases with many tie scores, as are found with responses to the following questions.

Because completion of assigned materials was important for attributing achievement gains to instruction, the questionnaire asked participants in the study if they had completed assigned readings or CAI. Table 5 shows the number of subjects who completed the assignments over Rogers' approach to counseling and Ellis' approach to counseling.
Table 5
Fisher Exact Test of Completing Assignments

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Rogers Assignment Yes</th>
<th>No</th>
<th>S</th>
<th>Ellis Assignment Yes</th>
<th>No</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI</td>
<td>9</td>
<td>8</td>
<td>1</td>
<td></td>
<td>8</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>TI</td>
<td>8</td>
<td>6</td>
<td>2</td>
<td></td>
<td>6</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Computation of the Fisher Exact Test on completion of each assignment yielded an S value of 10 which is not significant on a two-tail test at the .05 level.

The second aspect of instruction in this study was lecture discussions over the counseling theories. Table 6 shows the number of students who attended lecture discussion over Rogers' approach and Ellis' approach.

Table 6
Fisher Exact Test of Attending Lecture Discussion Sessions

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Attended Yes</th>
<th>No</th>
<th>S</th>
<th>Attended Ellis Yes</th>
<th>No</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI</td>
<td>9</td>
<td>8</td>
<td>1</td>
<td></td>
<td>9</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>TI</td>
<td>8</td>
<td>7</td>
<td>1</td>
<td></td>
<td>7</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

The S value for the Fisher Exact Test was 1 for attending the lecture discussion over Rogers, and 9 for attending
the Ellis session. Neither value is significant at the .05 level on a two-tail test.

The questionnaire also asked participants if they had received information on the theories during the course of the experiment from sources other than materials assigned for the study. Table 7 indicates the responses to the question.

Table 7
Fisher Exact Test of Receiving Additional Instruction on Theories

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Received Additional Instruction</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>CAI</td>
<td>9</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>TI</td>
<td>8</td>
<td>8</td>
<td>0</td>
</tr>
</tbody>
</table>

A Fisher Exact Test yielded an S-value of -32 which is not significant at the .05 level on a two tail-test.

Subjects in the study were asked about their previous computer involvement on question 7. Scale options ranged from "no previous computer involvement" through "nine or more times." Responses were made on a five point non-equivalent interval scale. Leach (1979) says that the Mann-Whitney U is appropriate for use when data are continuous and from two independent groups. The Mann-Whitney U attempts to decide whether the sets of scores come from the same population or different populations. Regarding question 7, a Mann-Whitney
U test for independent samples was performed by a Statistical Package for the Social Sciences computer program (Nie et al., 1975).

A summary of the question 7 Mann-Whitney U results is presented in Table 8.

Table 8

Mann-Whitney U Test of Previous Computer Involvement

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Corrected for Ties</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI</td>
<td>2.11</td>
<td>-.821</td>
</tr>
<tr>
<td>TI</td>
<td>1.88</td>
<td>.4118</td>
</tr>
</tbody>
</table>

After correction for ties, a Z-score of -.821 was attained. Differences between the two groups did not reach the .05 level of significance.

Students were asked to respond on a five point equal appearing interval scale to questionnaire items 8 through 13. T-test results for each item will now be discussed. T-test results were computed by a Statistical Package for the Social Sciences computer program (Nie et al., 1975).

Participants in the study were asked on question 8 if, prior to the study, they believed CAI was a good learning medium. A t-test was performed on the two group's responses. The results are summarized in Table 9.
Table 9

T-Test of Pre-Study View of CAI as a Good Learning Medium

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>S D</th>
<th>DF</th>
<th>T-Value</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI</td>
<td>2.667</td>
<td>.707</td>
<td></td>
<td>-1.98</td>
<td>.066</td>
</tr>
<tr>
<td>TI</td>
<td>3.250</td>
<td>.463</td>
<td>15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A T-value of -1.98 was obtained which is not significant at the .05 level on a two-tail test.

The subjects were asked on question 9 about their view of CAI as a learning medium following their participation in the study. Results of the t-test are summarized in Table 10.

Table 10

T-Test of Post-Study View of CAI as a Good Learning Medium

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>S D</th>
<th>DF</th>
<th>T-Value</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI</td>
<td>4.222</td>
<td>.972</td>
<td>15</td>
<td>3.54</td>
<td>.003</td>
</tr>
<tr>
<td>TI</td>
<td>3.000</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The T-value on a two-tail test was significant at the .05 level, indicating that the CAI group was more positive toward CAI than the TI group after completing the study.

Question 10 asked students about their level of involvement in learning material presented in the study. The results are summarized in Table 11.
Table 11

T-Test of Involvement in Learning Material

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>S D</th>
<th>DF</th>
<th>T-Value</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI</td>
<td>4.333</td>
<td>.707</td>
<td></td>
<td>15</td>
<td>2.35</td>
</tr>
<tr>
<td>TI</td>
<td>3.250</td>
<td>1.165</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A t-test was performed to test for significance of differences in ratings between the CAI and TI groups. A T-value of 2.35 yielded a two-tail probability significant at the .05 level.

Table 12 displays the results of responses to question 11 which asked if the students tried to just get through rather than learn the material.

Table 12

T-Test of Whether Students Tried to Get Through Rather Than Learn Material

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>S D</th>
<th>DF</th>
<th>T-Value</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI</td>
<td>1.778</td>
<td>.667</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TI</td>
<td>3.625</td>
<td>1.408</td>
<td></td>
<td>-3.53</td>
<td>.003</td>
</tr>
</tbody>
</table>

A t-test of the group means gave a t-value of -3.53 and a two-tail probability significant beyond the .05 level. On this question the CAI group again indicated a greater involvement in learning than the TI group.
Participants in the study were asked on question 12 if they would like to have been assigned to the other group. Table 13 shows t-test results of the subjects' preference for group assignment.

Table 13

T-Test of Preference for Assignment to the Other Group

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>S D</th>
<th>DF</th>
<th>T-Value</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI</td>
<td>1.444</td>
<td>.882</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TI</td>
<td>3.250</td>
<td>1.488</td>
<td></td>
<td>-3.09</td>
<td>.008</td>
</tr>
</tbody>
</table>

The TI group reported a greater wish to change treatments than the CAI group. A T-value of -3.09 gives a probability for a two-tail t-test significant at the .05 level.

On question 13 the subjects were asked if they would like to have the option of choosing to learn by CAI or TI. T-test results are presented in Table 14.

Table 14

T-Test of Option of Choosing to Learn by CAI or TI

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>S D</th>
<th>DF</th>
<th>T-Value</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI</td>
<td>4.111</td>
<td>1.691</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TI</td>
<td>4.000</td>
<td>1.069</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15 .16 .876
A T-value of .16 did not reach the .05 level of significance.

Summary and Conclusions

The primary purpose of this study was to explore the relative efficacy of adjunct computer-assisted instruction (CAI) and traditional instruction (TI) for teaching two counseling theories to undergraduate university students. Subjects who participated in the research were taught Carl Rogers' Person-Centered Therapy and Albert Ellis' Rational-Emotive Therapy.

Persons in the TI group received written text materials over the counseling theories and individuals in the CAI group learned equivalent content by computer tutorials. Members of both groups attended the same lecture discussion sessions. Computer tutorials were presented on television monitors by Apple microcomputers. During the study one computer malfunctioned at the beginning of a tutorial. The individual using the computer was moved to a different unit and completed the CAI with no further equipment problems.

Achievement gains in this study were tested for significance by analysis of covariance. Pre-test scores on the Achievement Instrument Over Person-Centered Therapy and Rational-Emotive Therapy and cumulative university grade point averages were used as covariates. Analysis of covariance revealed no difference in achievement between persons taught by adjunct CAI and traditional instruction. The no
difference finding in this research is consistent with studies conducted by Forsythe and Freed (1979), Rota (1982), Hamm (1976), and Dershimer (1981). Research by Culp and Castleberry (1971) and Johnson and Plake (1981) found significant achievement gains favoring adjunct CAI tutorials over TI. The studies which showed significant differences in achievement favoring CAI provided additional instructional time for members of the adjunct CAI groups. No studies were found in which equivalent instruction resulted in higher achievement gains for TI over adjunct CAI. Based on results found in the literature and the present study, it cannot be concluded that adjunct CAI results in superior achievement over equivalent written text materials plus lecture discussion.

It was anticipated at the outset of this study that CAI students who scored low on the pre-test would be moved up to the achievement level of those with higher scores by the effects of computer-assisted instruction. Kolmogorov-Smirnov tests showed that the distribution of scores on the post-test was not significantly changed by computer-assisted instruction. Studies by Arnett (1976) and Chizmar et al. (1977) also revealed no differences in achievement, based on student ability, between CAI tutorials and TI. Studies by Jamison et al. (1974), Abboud (1972), and Rubin et al. (1976) found CAI tutorials to be superior to other instructional methods for teaching low ability students. It appears at this time that
CAI is at least as effective as, and in some cases more effective than, traditional instruction in teaching low ability students.

Following completion of the post-test, members of both the adjunct CAI and TI groups anonymously completed the CAI/Traditional Instruction Questionnaire over their participation in the study. Participants were asked on the questionnaire about their experience with computers prior to the present research. A Mann-Whitney U test revealed there was not a significant difference between the two groups in reported prior use of computers. Therefore, this factor should not influence the interpretation of experimental outcomes in this study.

Two assigned tutorials were not completed by the CAI group and a total of four reading assignments were not completed by the TI group. Additionally, the CAI group reported not attending one, and the TI group two, lecture discussion sessions. Differences between the groups in assignment completion and lecture discussion attendance did not reach significance on the Fisher Exact Test. The issue of completion of assignments was not addressed in any CAI study found in the literature.

Four members of the CAI group reported receiving outside information on the assigned counseling theories. No one in the TI group reported receiving additional information on the theories. Although the difference between the two
groups in exposure to outside information appears large, it did not reach significance on the Fisher Exact Test. No studies were found in the literature which address the influence of outside instruction on achievement with CAI.

Attitudes of subjects toward CAI as a learning medium prior to and following the study were assessed on the questionnaire. A t-test showed no significant difference between the groups in their initial view of CAI. A t-test indicated that following the experiment the CAI group's evaluation of CAI was significantly more positive than that of the TI group. Rubinson and Robinson (1977-1978), Rubinson and Warner (1979-1980), and Dence (1980) concluded that following the use of CAI, students viewed computer-assisted instruction more positively and preferred it to lecture discussion. Dence also states that persons who have used CAI are more positive toward computer-assisted instruction than those who have not used CAI. No studies found in the literature report that students exposed to adjunct CAI had a negative attitude toward this teaching modality. The present study and those reported in the literature support the idea that exposure to CAI changes attitudes toward computer-assisted instruction in a positive direction.

Two items on the questionnaire address the issue of active involvement in learning. T-tests showed that CAI group members reported significantly greater involvement by their responses to both of these questions. No studies were found in the literature which asked students about their
involvement in learning. Alpert and Bitzer (1970) write that CAI absorbs the learner's attention, while Bork (1980) and Caldwell (1980a) point out that CAI makes students active participants in the learning process. No indications were found in the literature that CAI was less involving than written text material. The present study supports the conclusion that students feel more involved in learning with CAI than with written text material. Increased involvement in learning would seem to result in higher achievement gains, but there is no evidence that greater involvement with CAI leads to increased achievement over traditional instruction.

Subjects were asked on the CAI/Traditional Instruction Questionnaire if they would like to have been assigned to the other group. A t-test revealed that TI group members reported a significantly greater preference than persons in the CAI group for assignment to the alternate treatment. The findings in the present study are in opposition to those of Forsythe and Freed (1979) who found that half of the individuals in both CAI and TI groups reported a preference for assignment to the other treatment. Forsythe and Freed found no significant difference between the two groups on this measure. In the study by Forsythe and Freed students used CAI for two hours per week for 15 weeks and hardware failures plus scheduling problems were encountered frequently. A possible explanation in the present research for the preference of members of both groups for assignment to the CAI condition
is the novelty of using computers and learning by CAI. Long term use, coupled with equipment and scheduling difficulties, may alter the preference for using CAI.

The final item on the questionnaire asked subjects if they would like to have the option of choosing to learn by computer-assisted instruction or traditional instruction. A t-test showed no difference between the groups in their responses to this item, and members of both groups indicated that they would like to choose between CAI and TI.

Forsythe and Freed (1979) found that students wanted the option of choosing between CAI and traditional instruction. No other studies were found which specifically addressed the issue of preference for the option of using CAI or TI. In the present study confusion was expressed by subjects regarding the question asking if they would like to choose between CAI and TI. Some participants thought the question referred to the material covered in the research. Others thought the item referred to regular university coursework. The different ways the question was interpreted make analysis of the participants' responses subject to question. It might be cautiously concluded, based on the literature and the finding in this study, that students prefer a choice between computer-assisted instruction and traditional instruction.

The literature review for the present study supports the statement by Chambers and Sprecher (1980) that well designed and tightly controlled studies on achievement with CAI are
rare. A lack of instructional equivalence among treatments is commonly found in adjunct CAI research. This study attempted to provide comparable instruction to both treatment groups by developing CAI tutorials virtually verbatim from written materials used by the TI group.

To summarize, the major findings which can be made based on this study are as follows.

1. Adjunct computer-assisted instruction does not result in higher achievement than equivalent traditional instruction.

2. Students who complete computer-assisted instruction develop a more positive view of CAI as a good learning modality.

3. Students feel more involved in learning with computer-assisted instruction than with traditional instruction.

**Recommendations for Future Research**

1. The effects of not completing assignments and receiving information from outside sources on content material covered in CAI tutorials should be investigated in future experiments.

2. The effects of covariates on achievement with CAI should be further explored. In addition to ability and knowledge of subject matter prior to treatment, learning style and other personality factors related to the effectiveness of CAI should be investigated. Further research could attempt to identify these factors, so that for example, selective
assignment of CAI could be made of students most likely to benefit from its teaching format.

3. Further research should focus on assessing students' long term retention of information on counseling theories acquired by adjunct CAI.

Implications for Counselor Education

Approaches to counseling form the foundation for understanding and changing human behavior, and consequently are important in Counselor Education and related fields. As adjunct CAI was found to be at least as effective as traditional instruction for persons of different ability levels, CAI can be considered a viable alternative to written text material for introducing theories to all students in the various counseling fields.

Individuals who used CAI developed a positive view toward computer-assisted instruction; seeing it as a good learning medium and feeling involved in learning the content material. The literature on CAI suggests that CAI tutorials can be individualized and self-paced, so more time can be spent on areas of student need. The student can move quickly through material that is clearly understood. Students can benefit from tutorials by receiving immediate feedback from questions within the CAI, and results of tutorial quizzes can aid the instructor in preparing lecture discussion sessions to meet the assessed needs of students.
A series of computer tutorials over the major counseling approaches would add to the variety of teaching modalities presently available. A great deal of time is required to initially develop CAI tutorials on counseling theories. Once completed, however, they can be accessed by a large number of persons simultaneously, are easily transported, and can be used on compatible computer hardware at any location. CAI is also easily modified, and information can be updated, or tailored to meet needs of specific populations. The apparent benefits of CAI expressed in the literature and found in this study suggest that the development of a full complement of computer-assisted instruction tutorials on approaches to counseling is warranted.
APPENDIX A

INFORMED CONSENT FORM

Name of participant

I agree to participate in a study to be conducted by Donald E. Sampson entitled: A Comparison of Adjunct Computer-Assisted Instruction and Traditional Instruction for Teaching Counseling Theories.

I understand that:
This study is designed to compare two teaching approaches: computer-aided instruction and traditional instruction. The subject matter to be taught is part of required coursework for all persons taking this class and I agree to complete assigned materials pertinent to this study;
Because cumulative university grade point averages will be required for statistical reasons, I give my consent for the researcher to obtain my cumulative grade point average from the NTSU Registrar's office; and
All information obtained in the course of this study will be handled in a confidential manner and will be reported only as group data. Participation is non-paid and is completely voluntary. I am free to withdraw at any time with no penalty. My participation in this study will have no bearing on my grade in this class.

I wish to volunteer as a participant in this study.

Signature

Date

Social Security No:
APPENDIX B

PROPOSAL FOR RESEARCH
COLLEGE OF EDUCATION

Researcher: Donald E. Sampson

Proposed Title: A Comparison of Adjunct Computer-Assisted Instruction and Traditional Instruction for Teaching Counseling Theories

We, the Doctoral Advisory Committee, have read the proposal and have determined that:

1. No risk factor of human subjects exists.
2. No deception of subjects exists.
3. Informed consent by adults (or by a parent of children) has been obtained.
4. Subjects have been given the right to refuse to participate if desired.

Therefore, we agree that the rights of involved human subjects are protected.

For the committee,

[Signatures]

Note to Presider:

Please attach this completed form to the transmittal letter.

When doubt exists, the proposal should be referred to the Institutional Review Board.
APPENDIX C

JURY PANEL MEMBERS


Dr. John J. Pietrofesa, co-author of *Counseling: Theory, Research and Practice*, 1978

Dr. Gary S. Belkin, author of *Practical Counseling in the Schools*, 1975

Dr. Alan Hoffman, co-author of *Counseling: Theory, Research, and Practice*, 1978
May 5, 1982

Mr. Donald E. Sampson
1216 Autumn Oak
Denton, TX 76201

Dear Mr. Sampson:

Thank you for your recent letter about your research study comparing textbook presentation with computer assisted instruction. You have the permission of Brooks/Cole to reproduce Chapter 5 and Chapter 9 and portions of the associated chapters in both THEORY AND PRACTICE OF COUNSELING AND PSYCHOTHERAPY and the MANUAL FOR THEORY AND PRACTICE OF COUNSELING AND PSYCHOTHERAPY (Second Edition). The Instructor's Manual, of course, already has an implicit permission in it.

I hope that you will share the results of your study with Brooks/Cole whether they are favorable to text presentation or computer assisted instruction. I think it would be interesting to see how your research comes out.

Best of luck.

Cordially,

Claire Verduin
Editor

CLV:1b
PLEASE NOTE:

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

These consist of pages:

P. 63-74 Achievement Instrument Over Person-Centered Therapy and Rational-Emotive Therapy

P. 75-76 CAI/Traditional Instruction Questionnaire

P. 77-79 Person-Centered Therapy Self Study Quiz

P. 81-83 Rational-Emotive Therapy Self Study Quiz
APPENDIX E

ACHIEVEMENT INSTRUMENT OVER PERSON-CENTERED THERAPY AND RATIONAL-EMOTIVE THERAPY**

NAME ____________________________

Place the letter which represents the one best answer on the line in front of each question.

The following items are over Person-Centered Therapy.

1. The Person-centered view of human nature
   a. contends that people are basically competitive.
   b. holds that humans are driven by irrational forces.
* c. is rooted in a faith in the person's capacity to direct his or her own life.
   d. assumes that, while humans have the potential for growth, there is a tendency toward remaining stagnant.
   e. both (a) and (b)

2. Person-Centered Therapy is best described as
   a. a completed and fixed "school" of counseling.
   b. a dogmatic set of therapeutic principles.
   c. a systematic set of behavioral techniques.
* d. a set of tentative principles describing how the therapy process develops.
   e. none of the above

3. Person-Centered Therapy is a form of
   a. psychoanalysis.
* b. existential-humanistic therapy.
   c. behavioral therapy.
   d. cognitive-oriented therapy.
   e. both (c) and (d)
4. Which of the following is considered important in Person-Centered theory?
   a. accurate diagnosis
   b. accurate therapist interpretation
   c. analysis of the transference relationship
   d. all of the above
   * e. none of the above

5. What is the central variable related to progress in Person-Centered Therapy?
   a. defining concrete and measurable goals
   b. the therapist's technical skills
   * c. the relationship between the client and therapist
   d. the client's ability to think logically and employ the scientific method to solving problems
   e. the therapist's knowledge of psychodynamics

6. "Therapist congruence" is a term that refers to the therapist's
   * a. genuineness.
   b. empathy for clients.
   c. positive regard.
   d. respect for clients.
   e. judgmental attitude.

7. In Person-Centered Therapy, transference is
   a. seen as a necessary, but not sufficient, condition of therapy.
   b. viewed as a core part of the therapeutic process.
   c. regarded as a neurotic distortion.
   d. a result of ineptness on the therapist's part.
   * e. not an essential nor significant factor in the therapy process.

8. Which of the following is not a key concept of the Person-centered approach?
   a. The focus is on experiencing the immediate moment.
   b. The person has the capacity to resolve his or her own problems in a climate of safety.
   c. The client is primarily responsible for the direction of therapy.
   * d. The focus is on exploration of a client's past.

9. The Person-Centered therapist is best described as
   * a. a facilitator.
   b. a teacher.
   c. a human engineer.
   d. a friend.
   e. a judge.
10. "Accurate empathic understanding" refers to the therapist's ability to
   a. accurately diagnose the client's central problem.
   b. objectively understand the dynamics of a client.
   c. like and care for the client.
   * d. sense the inner world of the client's subjective experience.

11. Which technique(s) is (are) most often used in the Person-Centered approach?
   a. questioning and probing
   b. analysis of resistance
   c. free association
   * d. active listening and reflection
   e. interpretation

12. According to Person-Centered theory, a personal relationship between the client and therapist in which the therapist demonstrates attitudes of caring, empathy, positive regard, genuineness, and understanding is
   * a. a necessary and sufficient condition for therapy to occur.
   b. a necessary but not sufficient condition for therapy to occur.
   c. neither a necessary nor a sufficient condition of therapy.

13. The Person-Centered approach uses which technique?
   a. diagnosis
   b. probing and questioning
   c. interpretation
   * d. analysis of resistance
   e. none of the above

14. Which statement is most true of Person-Centered theory?
   a. Therapists should be judgmental at times.
   b. Therapists should direct the session when clients are silent.
   c. The skill a therapist possesses is more important than his or her attitudes toward a client.
   * d. The techniques a therapist uses are less important than are his or her attitudes.
   e. both (a) and (b)
15. Which of the following is a contribution of the Person-Centered viewpoint?
a. It calls attention to the need to account for a person's inner experience.
b. It has relied on research to validate the concepts and practices of the approach.
c. It provides the therapist with a variety of therapeutic techniques.
d. It focuses upon an objective view of behavior.
*e. both (a) and (b)

16. What is a limitation of Person-Centered theory?
a. The approach does not make use of research to study the process or outcomes of therapy.
b. The therapist has more power to manipulate and control the client than is true of most other therapies.
*e. People in crisis situations often need more directive intervention strategies.
d. The client is not given enough responsibility to direct the course of his or her own therapy.

17. For Person-Centered Therapy to be successful
a. the client must regard the therapist as an expert.
b. the therapist must actively guide client experiencing within the session.
c. the client must perceive the therapist as a significant individual from his or her past.
*e. the client must perceive a relationship of equality between the therapist and him or herself.

18. Person-Centered Therapy
a. is an extension of traditional psychoanalytic theory.
*e. was formulated as a reaction against psychoanalysis.
c. was developed independently of any other theory.
d. none of the above

19. The troubled individual according to Person-Centered Therapy
a. is disturbed because of behaviors incongruent with societal values.
b. is disturbed because of what he or she believes about experiences.
*e. distorts or denies what the organism experiences.
d. is disturbed because of unfinished business.
20. In Person-Centered Therapy
   a. a person who is real, caring and understanding will be an effective helper.
   b. therapeutic conditions are effective only in a psychotherapeutic relationship.
   c. it is more important that the therapist view the client's world as it actually is rather than as the client views it.

21. According to Person-Centered Therapy
   a. experiencing is a person's only reality.
   b. a person's central motivating force is toward unconditional positive regard.
   c. a person must struggle against the innate potential to be bad.
   d. none of the above

22. According to Person-Centered Therapy, psychological discomfort will be experienced when
   a. there is consistency between one's self-concept and ideal-self.
   b. there is congruence between one's self-concept and experience.
   c. the individual relies on an external rather than internal locus of evaluation.
   d. a person is overly empathic.

23. As Person-Centered Therapy progresses successfully, the client
   a. increasingly allows into awareness inner experiencing consistent with his or her self-concept.
   b. shifts from focusing on situations in the past to those in the present.
   c. combats irrational beliefs.
   d. increases his/her feelings of social responsibility.

24. Person-Centered Therapy has been effective with
   a. neurotics.
   b. psychotics.
   c. normal people.
   d. two of the above
   e. all of the above

25. Person-Centered Therapy has been successfully used in which of the following?
   a. educational settings
   b. family therapy
   c. intercultural groups
   d. all of the above
26. Which of the following statements is most consistent with the views of Person-Centered Therapy?
   * a. People are inherently good.
   b. People are irrational and unsocialized.
   c. A person's behavior stems primarily from unconscious forces.
   d. A person's behavior stems primarily from environmental forces.

27. According to Rogers, which of the following is not one of the necessary and sufficient conditions for personality change?
   a. Unconditional positive regard
   b. Empathic understanding
   c. The therapist is congruent or integrated  
   * d. Accurate diagnosis

28. According to Person-Centered Therapy, counseling will result in
   * a. more insight or understanding of the relationship between past and present behavior.
   b. more client discussion of symptoms.
   c. more client emphasis upon the past.
   d. less verbalization of feelings and experiences.

29. Most essential to understanding the theoretical conception of Person-Centered Therapy is
   a. knowledge of measurement theory.
   * b. knowledge of the phenomenological point of view.
   c. knowledge of learning theory.
   d. knowledge of various counseling practices.

30. The genuine counselor in Person-Centered Therapy
   a. must be a paragon of integration.
   b. assumes a "wholeness" in every aspect of his/her life.
   * c. is him/herself, even in ways which are not regarded as ideal for therapy.
   d. maintains high standards of conduct and expectations for all clients to meet.
The following items cover Rational-Emotive Therapy.

31. The founder of Rational-Emotive Therapy is
   a. William Glasser.
   b. Frederick Perls.
   * c. Albert Ellis.
   d. Joseph Wolpe.
   e. none of the above

32. Rational-Emotive Therapy belongs to which category of counseling therapy?
   a. client-centered
   b. psychoanalytic
   c. Gestalt
   * d. cognitive-behavior-action oriented

33. This approach to therapy stresses
   a. support, understanding, warmth, and empathy.
   b. awareness, unfinished business, impasse, and experiencing.
   * c. thinking, judging, analyzing, and doing.
   d. subjectivity, existential anxiety, self-actualization, and being.
   e. transference, dream analysis, uncovering unconscious, and early experience.

34. What words would best describe RET therapy?
   a. nondirective and client-centered
   b. experiential
   * c. highly didactic and very directive
   d. both (a) and (b)
   e. none of the above

35. RET is based on the philosophical assumption that human beings are
   a. determined by strong unconscious sexual and aggressive forces.
   * b. potentially able to think rationally, but have a tendency toward irrational thinking.
   c. basically trying to develop a life-style to overcome feelings of basic inferiority.
   d. determined strictly by environmental conditioning.

36. RET stresses that human beings
   * a. think, emote, and behave simultaneously.
   b. think but do not emote.
   c. emote but do not think.
   d. behave without emoting or thinking.
37. RET views neurosis as the result of
   a. inadequate mothering during infancy.
   b. failure to fulfill our existential needs.
   c. excessive feelings.
   * d. irrational thinking and behaving.

38. According to RET, what is the core of most emotional disturbances?
   * a. self-blame
   b. resentment
   c. rage
   d. unfinished business
   e. depression

39. RET contends that people
   a. have a need to be loved and accepted by everyone.
   b. need to be accepted by most people.
   c. will become emotionally sick if they are rejected.
   * d. do not need to be accepted and loved.
   e. both (b) and (c)

40. RET is based on the idea that we become emotionally disturbed because
    a. others indoctrinate us with irrational ideas.
    b. others withdraw their love if we do not think as they do.
    * c. we tend to keep reindoctrinating ourselves with irrational beliefs.
    d. both (a) and (b)

41. According to RET, we develop emotional disturbances because of
    a. a traumatic event.
    * b. our belief about certain events.
    c. the abandonment by those we depend on for support.
    d. the withdrawal of love and acceptance.

42. RET employs what kind of method to help people resolve their emotional, behavioral problems?
    a. the phenomenological method
    * b. the logico-empirical method
    c. the Gestalt method
    d. the philosophical method
43. The main therapeutic goal of RET is
a. to teach clients how to recognize which ego state they are in.
b. to make the unconscious conscious.
c. to assist the client in becoming aware of his or her "being-in-the world."
d. to challenge the client in making both a value judgment and moral decision about the quality of his or her behavior.
* e. none of the above

44. The main function of the rational therapist is
a. to become an "existential partner" with the client.
b. to create a climate of safety and freedom from threat.
* c. to challenge clients to re-evaluate their ideas and philosophy of life.
d. to encourage the client to experience fully the here-and-now.
e. to help the client relieve past emotional traumas.

45. RET can be considered as
a. an educative process.
b. a didactic process.
c. a process challenging ideas and thinking.
d. a teaching/learning process.
* e. all of the above

46. According to RET, a personal client-therapist relationship is
a. necessary, but not sufficient, for change to occur.
b. necessary and sufficient for change to occur.
* c. neither necessary nor sufficient for change to occur.

47. RET methodology includes all of the following methods except for
a. persuasion
b. counterpropaganda
c. confrontation
d. logical analysis
* e. analysis of the transference relationship

48. The role of the client in RET is like that of
a. a co-therapist.
b. a passive observer.
* c. a student or learner.
d. a partner.
49. RET stresses the importance of the therapist's
   * a. acting as a model for clients.
   b. demonstrating unconditional positive regard for all behaviors of the client.
   c. establishing a warm and personal relationship with the client based on liking and caring.
   d. both (a) and (b)

50. Which method(s) is (are) often employed in RET?
   a. the "homework assignment" method
   b. the contract method
   c. the logical-analysis method
   d. behavioral and action methods
   * e. all of the above

51. A possible criticism of RET is that it cannot be used with
   * a. secondary school age children.
   b. low level mental retardates.
   c. verbal children.
   d. criminal personality types.

52. RET is generally considered to be
   * a. a short term therapy.
   b. a re-socialization process.
   c. a long term therapy.
   d. primarily aimed at symptom removal.

53. RET stresses the importance of
   * a. punishment of people who are bad.
   b. "reliving" emotional trauma.
   c. accepting responsibility for one's self.
   d. past history as a determinant of emotions.

54. According to RET
   * a. individuals have innate biological tendencies toward irrational thinking.
   b. individuals have propensities to be self-destructive.
   c. all people are fallible human beings.
   d. all of the above

55. What is a limitation of RET?
   * a. RET is by nature a long-term therapy.
   b. Therapists may impose their own values and philosophies on clients.
   c. RET over-emphasizes the importance of a client's past.
   d. RET can be used for only a narrow range of problems.
56. According to the A-B-C theory of personality, which letter represents the experience of emotion?
   a. A  
   b. B  
   * c. C  
   d. D

57. Rational-Emotive Therapy
   a. emphasizes the importance of socially correct behavior.  
   * b. emphasizes carrying out homework assignments in everyday life.  
   c. is concerned more with a client's emotions than his or her thinking.  
   d. states that rational living will eliminate psychological discomfort.

58. RET can be used with which of the following types of persons?
   * a. deaf-mutes proficient in sign language.  
   b. those out of contact with reality.  
   c. non-verbal autistic clients.  
   d. very low level mentally deficient persons.

59. In Rational-Emotive Therapy
   a. there is a strong emphasis for the client to do most of the talking.  
   * b. the therapist is frequently highly active.  
   c. it is important that the therapist at least like the client.  
   d. the client must fully experience emotions surrounding problems.

60. RET therapists help their clients work toward
   a. a capacity to be interested in themselves.  
   b. increased self-direction.  
   c. a scientific way of thinking.  
   * d. all of the above

61. A major concept in Rational-Emotive Therapy is
   a. that thinking and emotion are two discrete processes.  
   b. that emotional problems are caused by environmental forces.  
   * c. that emotional behavior stems from self-talk or internalized sentences.  
   d. that emotions are beyond the control of an individual.
62. Rational-emotive therapists believe that
   a. one's past history determines one's present behavior.
   b. in the long run it is easier to avoid than face certain life situations.
   * c. what the individual tells him/herself is or becomes thoughts and emotions.
   d. human unhappiness is externally caused.

63. The major task of the rational-emotive therapist is
   a. to accept and understand the client.
   b. to teach the client to learn about self and the environment.
   c. to test the client.
   * d. to show the client that his/her difficulties stem from illogical thinking.

64. Rational-emotive therapists use relationship techniques.
   a. almost exclusively.
   * b. to gain the client's rapport, trust, and confidence.
   c. to alter the client's illogical thinking.
   d. only with neurotic clients.

65. Passivity on the part of a rational-emotive therapist.
   * a. encourages clients to take advantage of the counselor and to avoid facing and working on problems.
   b. encourages clients to talk out their troubles.
   c. is interpreted by clients as disinterest in them.
   d. encourages clients to believe they are equal to the counselor.

* Denotes correct response

APPENDIX F

CAI/TRADITIONAL INSTRUCTION QUESTIONNAIRE

1) I was assigned to the:
   ____ CAI (computer-assisted instruction) group.
   ____ traditional instruction group

2) Regarding assignments for this study, I completely covered the reading or CAI for:
   ____ Rogers' theory  ____ Ellis' theory

3) I attended class discussion for:
   ____ Rogers' theory  ____ Ellis' theory.

4) The only information I received on Ellis or Rogers during this study was the material assigned to me.
   ____ yes  ____ no
   If "no," please explain (e.g. Ellis assigned in another class).

5) My gender is  ____ Male  ____ Female

6) My age is  ____ years

7) Prior to participation in this research project, my involvement with computers had been:

   None at all  1  2  5 Times  3  4  9 or more  5

8) Before this study I believed CAI was a good learning medium.

   Strongly disagree  1  2  No opinion  3  4  Strongly agree  5

9) After participating in this study I believe CAI is a good learning medium.

   Strongly disagree  1  2  No opinion  3  4  Strongly agree  5
10) Overall, I was very involved in learning the material presented.

Strongly disagree   No opinion   Strongly agree
1         2         3         4         5

11) I found myself trying to get through the material rather than trying to learn.

Strongly disagree   No opinion   Strongly agree
1         2         3         4         5

12) I wish I had been assigned to the other group.

Strongly disagree   No opinion   Strongly agree
1         2         3         4         5

13) I would like to have the option of choosing to learn by CAI or traditional instruction.

Strongly disagree   No opinion   Strongly agree
1         2         3         4         5
APPENDIX G

PERSON-CENTERED THERAPY SELF STUDY QUIZ

The following questions are true/false or multiple choice. After answering all items compare your responses with those on the attached answer sheet.

1. Roger's approach is existential in nature.

2. Knowledge of theory and techniques designed to promote behavioral change forms the core of Person-Centered Therapy.

3. Person-Centered Therapy asserts that given proper conditions humans will develop in a positive manner.

4. The Person-Centered approach stresses the importance of a client viewing the therapist as an expert.

5. Rogers postulated that three conditions provide the climate to provide growth. They are:
   a) id, ego, and superego.
   b) genuineness, caring, and deep understanding.
   c) genuineness, phenomenology, and deep understanding.
   d) self-responsibility, rational thinking, and reality based beliefs.

6. Rogers views Person-Centered theory as an established, rather than tentative set of principles.

7. The phenomenological view emphasizes the importance of
   a) viewing the client's world objectively.
   b) interpreting client behavior according to established theoretical principles.
   c) viewing the client's world from the client's perspective.
   d) none of the above
8. According to Person-Centered Therapy, the same therapeutic principles apply to normal as well as disturbed persons.

9. According to Person-Centered theory genuineness, caring, and empathy are necessary, but not sufficient conditions for client change to occur.

10. Person-Centered Therapy can help the client gain greater power and self-control.

11. The primary goal of Person-Centered Therapy is to help the client
   a) resolve his or her current personal difficulties.
   b) move forward in his or her growth process.
   c) live more rationally, thus avoiding many personal difficulties.
   d) gain power and control over others.

12) According to Rogers, a person who is becoming increasingly actualized
   a) becomes more open to experience and trusting of him/herself.
   b) increasingly looks to him/herself for answers to difficulties and is willing to view personal growth as a continuing process.
   c) begins to think and live more rationally.
   d) A and B above

13. A Person-Centered therapist should present him/herself as someone who has resolved most personal difficulties.

14. An example of client "incongruence" is a discrepancy between self-concept and ideal self-concept.

15. As Person-Centered Therapy progresses clients may be expected to bring up more anger, hatred, guilt and other negative emotions.

16. Rogers hypothesized that if empathic understanding, nonpossessive caring and genuineness occur in a relationship, then growth and positive personal development will occur.

17. In Person-Centered Therapy an accurate diagnosis leads to the selection of appropriate therapeutic techniques.
18. According to Person-Centered Therapy genuineness means that
   a) the therapist shares all of his or her feelings with the client.
   b) the therapist expresses a deep caring for the client.
   c) the therapist is willing to share both positive and negative feelings with the client.
   d) B and C above

19. Unconditional positive regard for a client implies that the therapist approves of the client's behavior.

20. For accurate empathic understanding to occur the therapist shares the client's subjective world without losing his/her separateness.

21. The conditions of unconditional positive regard and acceptance, empathic understanding, and genuineness or congruence are dichotomies; they are either present or they are not present.

22. The Person-Centered approach evolved from a non-directive therapy to an experiential therapy.

23. The most recent formulation of Roger's theory permits more active participation by the therapist as compared to earlier concepts of Person-Centered Therapy.

24. Rogers believes that persons are motivated to self-actualize within the reality they perceive.

25. Due to its active and directive nature Person-Centered therapy is safer than many other forms of therapy.

26. A characteristic of Person-Centered Therapy is that it
   a) teaches a more "rational" lifestyle.
   b) focuses on linking one's past with one's present.
   c) permits clients to explore areas they deem important to work on.
   d) none of the above

27. A limitation of Person-Centered Therapy is that practitioners frequently tend to oversimplify Roger's approach.

28. Some Person-Centered therapists give up their personal power, thus limiting their therapeutic effectiveness.
# Answers to Person-Centered Therapy Self Study Quiz

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<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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APPENDIX H

RATIONAL-EMOTIVE THERAPY SELF STUDY QUIZ

The following questions are true/false or multiple choice. After answering all items compare your responses with those on the attached answer sheet.

1. RET is most concerned with
   a) thinking.
   b) feeling.
   c) congruence.
   d) transference.

2. RET emphasizes disputing one's irrational beliefs.

3. According to Ellis, it is rational to strive for infallibility.

4. Ellis contends that emotions operate independently of actions, but consistently with thoughts.

5. Ellis maintains that people have biological predispositions to act in ways that may perpetuate self-defeating behavior.

6. Ellis views psychopathology as "irrational thinking and behaving."

7. RET stresses that we actively maintain disturbances by reindoctrinating ourselves with unverifiable statements.

8. Which of the following beliefs does Ellis say can lead a person to discomfort and self-defeat?
   a) It is necessary that persons I want to love me do love me.
   b) I should be thoroughly competent in order to be worthwhile.
   c) My past history determines how I feel today.
   d) all of the above
9. According to RET, people are disturbed by
   a) incompletely completed transactions.
   b) external events.
   c) their beliefs about events.
   d) none of the above

10. Ellis maintains that one can feel better by disputing one's
    a) activating events - A.
    b) beliefs - B.
    c) emotional consequences - C.
    d) disputations - D.

11. RET holds that people actively seek ways to change
    their personalities in order to avoid self-defeating behavior and personal discomfort.

12. RET's major therapeutic goals are being aware of irrational beliefs and adopting a more rational philosophy of life.

13. RET holds that emotionally healthy people
    a) measure their self-worth by the value of their actions.
    b) remain flexible and open to change.
    c) work with others in order to solve most of their own personal difficulties.
    d) all of the above

14. An RET therapist attempts to help clients
    a) understand that they have incorporated many irrational "shoulds," "musts," and "oughts."
    b) understand that they keep their disturbances active by repeating self-defeating sentences.
    c) develop rational philosophies of life.
    d) all of the above

15. RET therapists are highly active and directive in therapy.

16. RET is primarily a reeducative process.

17. Ellis maintains that clients will begin to feel better only when they understand that their present problems were caused by their past experiences.

18. RET stresses the importance of actively and diligently working to overcome irrational beliefs.

19. Ellis maintains that empathy, genuineness, and unconditional positive regard are necessary, but not sufficient conditions for effective therapy.
20. RET therapists should model a rational lifestyle for their clients.

21. The primary cognitive method used in RET is actively disputing irrational beliefs.

22. RET therapists generally utilize techniques from the cognitive, emotive, and behavioral areas with each client.

23. RET therapists assign homework less often than person-centered therapists.

24. Ellis maintains that any person who is willing to work diligently will be helped by RET.

25. Compared to other individual therapies, RET is generally considered to be of relatively short duration.

26. Ellis frequently suggests that clients participate in group as well as individual therapy.

27. The active and directive nature of RET gives the therapist a great amount of power in the therapeutic situation.

28. As a part of the therapeutic process RET stresses action after gaining insight.
ANSWERS TO RATIONAL-EMOTIVE THERAPY SELF STUDY QUIZ

1. A  15. True
2. True  16. True
3. False  17. False
4. False  18. True
5. True  19. False
6. True  20. True
7. True  21. True
8. D  22. True
9. C  23. False
11. False  25. True
12. True  26. True
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