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THE VALIDATION OF A PROGRAMMED TEXT: BEHAVIORAL COUNSELING FOR
ALCOHOL-RELATED PROBLEMS

by

Suzanne Carol Leiphart

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<div align="right">Suzanne Carol Leiphart</div>

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Early Research and Development of Programmed Instruction

Although S.L. Pressey is generally credited with the invention
of the teaching machine, the first programmed instruction device was
developed by Halycon Skinner in 1866. The earliest programmed texts
were written by Randall in 1810 (Note 1) in the area of penmanship.

Pressey, indeed, is psychology's founder of automated teaching.
He first presented his devices to the American Psychology Association
in 1924 and in 1925 in a paper entitled "A Simple Apparatus Which
Gives Tests and Scores – and Teaches" (1926). The purpose of the
first machine, which was the size of a 1926 portable typewriter, was
to provide information to the student, to teach and drill the student,
and to score the results. The next device developed by Pressey (1960a)
was a multiple choice machine which drilled the student until the stu-
dent was able to correctly answer all the questions consistently.
This device eliminated further presentation of the material once
the student had two successive correct answers.

Many of the first experimental studies concerned with immediate
feedback and programmed instruction occurred in the early 1930's.
Peterson (1930) experimentally tested his automatic self-checking
device, the Self-Instructor and Tester. Experimental and control
groups were given the same reading material, questions and similar
answer sheets. The only difference was that the experimental group
received chemically treated answer sheets and a "chemopen" which re-
sulted in the correct answer area becoming a different color after

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being marked. Peterson found significant differences in favor of the self-checking feature.

Little (1934) found that college students scored significantly higher on final examinations, after having taken 12 unit tests from a testing machine in which the results were immediately scored and tabulated by the instructor, than control groups which did not receive immediate test results. Students who were taught with a drilling machine, and who also received immediate feedback, scored slightly higher on the final examination than the experimental group which only received immediately tabulated scores. It was found by Angell and Troyer (1948) that "immediate knowledge of test results is consistent with the leading theories of learning as proposed by E.L. Thorndike (1932), E.R. Guthrie (1935), C.L. Hull (1943) and E.C. Tolman (1932)".

Little research or use of programmed instruction occurred between the time of Pressey and the late 1940's. Because of what Evans, Glaser and Homme (Note 6) referred to as being an easier and more intriguing task, more time was initially spent in developing teaching machines, rather than in developing the technology for the construction of teaching programs. During most of the late 1940's and early 1950's those in the area of programmed instruction were primarily interested in devising simpler and less expensive teaching machines (Angell & Troyer, 1948), or machines which scored answers more promptly (Pressey, 1950; Stephens, Note 2).

One of the first programmed texts was developed by Ferster and Sapon (1958) to teach German. The text consisted of equivalent

pairs of sentences written in English and German. After completion

of the text students were tested in the areas of vocabulary, recogni-

tion, translation and active vocabulary. Means for each of these

categories ranged from 81 percent to 96 percent accuracy. Mean time

spent with the text for the six subjects was 47.5 hours. Results in-

dicated that the subjects learned a comparable amount of German to

students in a three-credit hour college German course where each

student spent 48 hours in class alone. Factors Fester and Sapon

saw as contributing to their results were the following:

(a) The small quantity of work required for each reinforcement;

(b) the introduction of new vocabulary words in a controlled

manner; (c) the control of overmastery; (d) a graded level of

difficulty; (e) no drilling of grammer, syntax, or concepts principles.

Porter (Note 4) discussed problems with and the advantages of

teaching devices used to teach foreign languages. He strongly re-

commended that these devices have both audio and visual components.

B.F. Skinner's Influence on Programmed Instruction

The middle and late fifties initiated Skinner's work in program-

med teaching. Skinner (1960) emphasized to educators the importance

of the use of one particular teaching machine. With this machine,

immediate reinforcement for the right answer was available in the

form of the pupil being able to turn a knob, which resulted in the

presentation of the next question, only if the prior question had

been answered correctly. A second advantage of this machine, Skin-

ner showed, was that a teacher could easily supervise the work of

an entire class. Students could also progress at their own rate.
The machine provided the means for a complex repertoire to be most
efficiently acquired.

Skinner (1960) discussed the importance of teaching machines
which required a constructed response rather than a multiple choice
response, the only response mode in use until this time. The article
by Skinner also encouraged the use of small steps in which one frame,
or step, was presented at a time. The answers were to be constructed
by moving letters or figures. The constructed answer was then compared
with a coded answer and scored correct or incorrect. A new response
had to be constructed if the initial response was emitted incorrectly.

For older students, Skinner recommended a machine where the stu-
dent's written response would be entered into the machine. The stu-
dents's response and the correct written response would both appear
in a translucent window. If the responses, matched, the student
pushed a lever which punched a hole in the correct response. If the
student did not consider his/her response to match the correct re-
sponse, she/he pushed a different lever which presented the next frame.
After all the frames were displayed and responded to, the machine pre-
sented those missed frames a second time. This process continued
until all frames were responded to correctly.

Skinner described the steps necessary in writing an effective
teaching program in two paragraphs. Later Skinner and Holland (1960b)
discussed, in much more detail, the how-to aspects of programming,
but they thought it was also important to communicate the mechanical

aspects of programming. Several pages discussed ways to economize on space. The authors described, in one paragraph per topic, all of the following·details regarding the design of programmed instruction devices: (a) program length, (b) frame length, (c) frame set length, and (e) writing the actual frames. The one area in which Skinner and Holland went into considerable detail was the use of formal and thematic prompts to evoke errorless responses. Formal prompts included the presentation of definitions, examples, rhymes or the provision of beginning or ending letters. Thematic prompts involved "lead-ins", categories, sublanguages, opposites, and common phrases. As will be discussed later, entire books composed of hundreds of pages were written in the late sixties and seventies which described exactly how to write a program (Markle, 1969; Becker, Englemann & Thomas, 1975).

Skinner and Holland's (1960) first programmend instruction research was discussed in a 1958 article in which machine teaching was compared with studying a textbook. The data were collected from a student questionnaire given to all participants. Seventy-seven percent of the students checked that they received more from the course with machine and conventional textbook than they thought they would have without the machine. Sixty-two percent checked that the machine made conventional text easier to comprehend. Sixty-seven percent said they would prefer to have machines used for parts of all science courses. Other studies published as institutional reports by Eigen and Komoski (Note 3) and by Roe et al. (1962)

supported the notion that programmed texts are also as effective teaching devices as machines.

Skinner's programming techniques were praised and enumerated by Porter (Note 4) in that they: (a) Presented sequenced material one step at a time; (b) required that the student record his/her answers, and (c) give immediate feedback as to the appropriateness of the answers. Porter emphasized that the advantages to Skinner's programs were the assurance that the student encounter the prerequisite material prior to the complex lessons, and that less adequate students would not be punished for not keeping up with the other students. Porter pointed out that reinforcement was two-fold, in that students were reinforced by being able to manipulate the machine to go on to the next item and that mastery of the content was reinforcing. With the use of machines, the teacher was freer to improve the quality of his/her other activities.

As most other proponents of programmed instruction, Holland (1960) discussed the advantages and necessity of mechanical teaching devices. He wrote that programmed texts, flashcards or workbooks were less effective because they offered less control. Holland (Note 6) added to Skinner's a fourth important step necessary to programmed instruction, fading, or the "gradual withdrawal of stimulus support, which is more effective in teaching than simple repetition of the instructional material". Other new principles presented by Holland were the importance of controlling the echoic and observing behavior of the student as well as the inclusion of discrimination training within each program, particularly in foreign language training programs. Also, for the first time a

programmer, Holland, spoke of the need to revise and correct programs.
He said that student errors were a reflection on the program quality,
not on the student. Holland (1959) found, after doing an item analysis
of student responses in a psychology program at Harvard and after re-
vising the program based on this information, that percent errors in
responding dropped from 20 percent in 1958, to 11 percent errors in
1959.

Meyer (Markle)

Meyer (1960) was also one of the first researchers in programmed
instruction. She found that when immediate self-scoring and delayed
teacher scoring groups were compared, the self-scoring groups, whose
answers were presented on the following page of the text, had fewer
ommissions and fewer commission errors. She found that there were no
significant differences between groups whose errors were corrected
and those whose errors were not corrected. Data were collected on
the bases of the pre-test scores, post-test scores, gains, errors
in the text, ommission errors, mis-scoring and types of errors made.
It was found by Meyer that correct self-scoring was not related to
reading skills, familiarity with the material, or to the number of
errors made by each student.

In the same study, Meyer (1960) analyzed the effectiveness of
the major prompts used in the programmed text. The least percentage
of errors (3%) occurred with the junior high school students when
"simple" copying prompts were used and when the number of elements
to be supplied was restricted (1% errors). The greatest percentage

of errors (30%) occurred when students were required to search a panel, which contained a paragraph or more of material, for the correct sentence or phrase. Copying "complex" material also resulted in a high percentage of errors (24%).

Branching

Until 1960, Skinnerian-type programming or linear programming was the technique most often used. Crowder (1960) developed intrinsic programming, which later came to be known as branching. Crowder referred to intrinsic programming as programming where "the necessary program of alternatives is built into the material itself in such a way that no external programming device (such as a computer) is required" (p. 289).

In an intrinsic or branching program the student was asked to read a paragraph of information and answer a multiple choice question. If the question was answered correctly, the student moved to the next unit. If the question was answered incorrectly, the student moved to a remedial unit. The remedial units had the same design as the regular units.

Evans et al. (Note 5) found that groups exposed to branching conditions as compared with non-branching groups did not show a significant difference in peformance. Keislar (1960) found that elementary students who responded to 110 multiple choice items on a teaching machine received significantly higher post-test scores on a constructed response examination than the control group subjects.

In an experiment by Evans et al. (Note 5), one group was re-

quired to emit written responses in a sequence regarding the funda-
mentals of music. The other groups were not required to make overt
written responses. The group which did not make the overt written
responses scored higher than the others, but not significantly so.
Those not writing the answers completed the sequences faster. In
a third experiment it was determined that subjects receiving the
learning sequence showed less variability in performance and had
higher achievement test scores than those receiving traditional
textbook instruction consisting of the same information.

Coulson and Silberman (1959) found results similar to Evans
et al. (Note 5) with junior college students who were experimentally
trained with simulated teaching machines. Results indicated that
teaching machine instruction led to significantly more learning for
the experimental groups as compared with the control group. No sig-
nificant difference in learning occurred between groups required to
make constructed responses compared with the multiple choice response
mode groups.

Fry (1960) compared constructed response modes and multiple
choice response modes. It was concluded by Fry that if the criter-
ion for learning is recall, then the constructed response mode is
the most effective training mode.

Branching

It was the goal of Evans et al. (Note 5) to look at effective
program development. They chose to look at the sequences and prop-
perties of verbal learning. The learning sequences used by the
authors were composed of short written steps requiring the students

to provide one or more written responses. The authors used a sequence to teach conversion to bases other than ten. The original sequence consisted of 51 steps. Steps were added or deleted from this sequence such that four treatment groups used 30, 40, 51, or 68 steps. Results indicated that more steps were associated with fewer errors. It was also found that more steps required more time for sequence completion. They also discovered that small step sequences yielded higher post-test scores than larger step sequences.

Educational Revolution

With the great influx of teaching machines it was the thought, of persons in the programming field, that a great educational revolution would take place. Ramo (1968) predicted future "push button" classes with a teacher present simply to supervise students, where everything would be taught by machine. Those skilled in designing teaching machines were thought to soon be candidates for teachers. Finn (1960) discussed the stresses and strains of any new technology on society, but said that despite this, the future with teaching machines would be better. Blyth (1960) condoned wide use of teaching ing machines because of their time and cost effectiveness.

Since teaching machines had been shown to be extremely time effective, more could be learned by students in less time, thus requiring less classroom contact, teacher contact, or building use hours. Blyth emphasized that teaching machines would be placed in one's home rather than in the schools. With machines as teachers, students would avoid the poor teaching, and there would be more objectivity in the treatment of students and the treatment of

subject matter, it was thought.

Some Early Problems Regarding Teaching Machines

Pressey (1960b) summarized some of the problems with programming that may account for the fact that today most education does not follow the predictions made regarding an educational revolution, that most students would be soon taught strictly with teaching machines. Pressey stated the following problems.

1. Still more research is needed to determine the most effective teaching programs.

2. That programs must be modified for the specific culture group with which they are being used.

3. That teaching machine experience may not be generalized to applied settings.

4. That teaching machines may not provide the motivation necessary for some students to learn.

·5. That programs may not be developed because of the tremendous amount of time and reconstruction necessary for programming.

6. That programs may be too clumsy for teachers to handle.

Lumsdaine (1959a) saw programming problems as questions for research. Those problems, in 1959, were that the best step size was not known, the most appropriate content of prompts or the manner of cueing was not specified, and the best program sequencing logic was not known.

Carr (1960) described five types of errors associated with pro-gram writing in generalized stimulus-response terms.

1. The programmer may incorrectly delineate the total stimulus-response connections to be formed.

2. The programmer may overestimate or underestimate the initial stimulus-response connections.

3. The programmer may not sufficiently condition some of the terminal or transitional stimulus-response connections.

4. There may be defects in the stimulus-response progression.

5. The programmer may make premature progressions in the topography of transitional stimulus-response connections.

Changes in Programmed Instruction in the Sixties

With the 1950's and earlier years being a concentration on the design of teaching machines, the 1960's to the present resulted in more of an emphasis on the technology of programming. Programs also were implemented in places other than schools, particularly in industry and in government agencies. Fewer and fewer new teaching machines were developed while thousands of programmed texts were written.

Technological Developments in Programmed Instruction

Gagne (1965) emphasized the development of instructional objectives as a prerequisite to writing a program. Discussion of the use of objectives with programming in the early sixties was engaged in by Cook and Mechner (1962), Mager (1961a), and Klaus (1962).

One reason these authors generally gave for specifying objectives was that if one precisely described and clarified the desired terminal behavior, the programmer might more efficiently sequence the program. Another reason given was that clearly specified behavior was more susceptible to measurement, thus program validation and evaluation was easier and more likely to be objective. A third general reason was that the specification of behavior classes, such as chains or discriminations, involved specific implications of the conditions

necessary to teach these skills. Gagne (1962a) and Mager and McCann (1961) emphasized that behavior definitions or behavioral objectives were required so that the reinforcement schedule for the student might be established.

Gagne (1965) claimed that objectives were task descriptions. The objectives imitated most frequently in the sixties were those of Miller (1961) and Mager (1962). Miller recommended that an objective consist of several components including the presentation of (a) a word indicating beginning action, (b) an action word or verb, (c) words describing the object to be manipulated, and (d) a word indicating adequacy of the response.

Mager (1962) viewed objectives as consisting of aspects including (a) a definition of the acceptable behavior, (b) a definition of the conditions under which the behavior is to occur, and (c) a performance criterion.

In the sixties, authors such as Gilbert (1962), Miller (1962a) Mager (1962), Gagne (1962a), Stolurow (Note 7) and Cotterman (Note 8) discussed task analysis as the step following the specification of behavioral objectives. Miller (1962a) recommended that the student be given the following information regarding tasks to be completed: (a) a goal orientation, (b) task information, (c) conditions for long and short-term retention, (d) problem-solving exercises, and (e) practice sequences.

Mager (1962) saw great importance in teaching the student to (a) sense or discriminate, (b) identify, and (c) interpret. Stolurow (Note 7) and Cotterman (Note 8), as summarized by Gagne

(1965), found that the content to be learned by the student should include the following highly detailed components such as the (a) specification of the number and length of the sequence of each stimulus-response, (b) delineation of the variations allowed with the stimulus and response, (c) meaning of each stimulus and response, (d) linkage pattern of stimuli and responses, and (e) compatibility and homogeneity of each stimulus and response.

Gilbert (1962a) presented steps necessary for a new operant to be established. He recommended that each step should specify that (a) an observing response occur, (b) the stimulus situation paired with each response be identified, (c) the desired response occur, and (d) reinforcement be provided.

Many looked at task analysis in terms of Bloom's (1956) taxonomy of educational objectives. These objectives included the categories of (a) knowledge objectives, (b) comprehension objectives (c) application objectives, (d) analysis objectives, (e) synthesis objectives, and (f) evaluation objectives.

Gagne (1965) categorized the behaviorally optimal conditions for learning into response differentiation, association, multiple discrimination, behavior chains, class concepts, principles and strategies. A review of the early 1960 research regarding variables necessary in programming, indicated that several studies showed significant advantages of building hierachies, progressively raising response contingencies, and using a gradual progression through the subject matter. See Holland (1965), Gavurin and Donahue (1960), Levin and Baker (1963), Roe, Case and Roe (1962), Wolfe (Note 9), Reynolds and

Glaser (1962).

Holland (1965), as a result of Skinner's work (1961), emphasized the shaping of response topography when a response had a very low probability of being emitted. He recommended discrimination training or shaping as a form of gradual progression based on Terrace (1963), Taber and Glaser (1962), Csanyi (Note 10), Suppes and Ginsberg (1962), Evans (Note 11) and Skinner (1953). In terms of the gradual raising of response contingencies, Holland recommended the establishment of single stimulus response associations. His technique was based on work by Angell and Lumsdaine (1961), Israel (1960), and Schaefer (Note 12).

Holland found that the behavior of the student which must occur in a program is likely to be retained. Eigen and Margulies (1963) demonstrated that when the goal of a program is to teach seven nonsense words and the student is required only to fill in the blanks with three of the words, only these three words will be learned. Resnick and Ellis (Note 13) and Holland (Note 6) obtained similar data.

To assure correct responses on first attempts, Holland (1965) suggested prompting the student with the correct answer before the student was required to supply the correct answer. A Kaess and Zeaman (1960) study opposed the shcool of thought that one learns more through the emission of frequent errors. This school of thought emphasized that if reasons why a response was an error are given in the program, more skill or knowledge would be acquired by the student. Kaess and Zeaman found that the shaping procedure where there is the possibility of emitting only one response was superior to conditions in which five, four, three, or two alternatives

were available. They concluded that with multiple choices the degree of item mastery is inversely related to the number of choices.

Several unanswered research questions in the early sixties, as described by Holland were:

1. What functions as reinforcement in a program?

2. What happens when the reinforcement magnitude varies?

3. What are the effects of reinforcement or nonreinforcement? Many studies found that answer confirmation compared with no confirmation resulted in no difference in skill acquisition (Feldhusen and Birt, 1962; Holland, Note 6; Hough and Revsin, 1963; McDonald and Allen, 1962; Moore and Smith, 1961, 1962). Many studies found significant differences with an advantage for answer confirmation (Meyer, 1960; Angell, 1949; Kaess and Zeaman, 1960). In terms of the use of intermittent confirmation, it was found by Scharf (1961) and Krumboltz and Weisman (1962) that as the intermittent ratio increased, the error rate also significantly increased.

Emphasis on Response Mode

Much of the early sixties' research dealt with the response modes of overt versus covert responding or constructed versus multiple choice responding. Some studies showed significant advantages for overt responding in programs (Williams, 1963; Holland, 1965). Others showed no significant difference between overt and covert responding on learning (Goldbeck and Campbell, 1962; Hartman, Morrison and Carlson, 1963; Keislar and McNell, 1962; Alter and Silverman, 1962; Tobias and Weiner, 1963; Stolurow and Walker, 1962; Evans, Homme and Glaser, 1962). Skinner (1960) maintained that, theoretically, overt response requirements made more sense because covert responding

often was not present when no overt responding occurred.

Similar was the case of constructed versus multiple choice responding. Many studies failed to find significiant post-test differences between constructed response groups and multiple-choice response groups (Burton and Goldbeck, Note 14; Evans, Homme and Glaser, 1962; Hough, 1962; and Price, Note).

Content Organization

The early sixties resulted in several views, supported with or without data, regarding content organization within a program. Mager (1961a) proposed that selected program topics be learner rather than instructor selected, such that no topic function as a prerequisite topic for the other topics. A few elaborate procedures based on the ruleg system were developed by Thomas et al. (1963). The ruleg system, originally developed by Glaser is a system in which the learner is presented with one conceptual rule (ru) and then must work through several examples (egs) illustrating the rule. It was hypothesized that without working through the examples, the student would not learn the rule or be able to generalize it to other situations. Some programs used the egrule system where several examples first were presented and then were followed by a rule. Stolurow (Note7) contended that program content be organized based on rules of logic. Klaus (1964) thought the student should initially be (a) required to discriminate an incorrect from a correct response, then be required (b) to edit answers, and lastly required to (c) produce his/her own answers completely. Gagne (1962a) viewed sequencing as the production of a hierarchy of learning sets, identified by a progressive

analysis of long and short term objectives. It was suggested by Gilbert (1962a) that if a behavior chain were to be learned, the instruction should proceed backward starting at the end of the chain.

Error Analysis

Lewis and Pask (1965) found that when programming, subject matter must not be analyzed and structured in total disregard of the learner's capabilities and error patterns. Harlow (1959) referred to confusions by students which obstructed the learning process as "error factors". Lewis and Pask (1965) claimed that error factors were particularly interesting when they generated whole classes of mistakes. They said these were interesting because they provided the opportunity for the programmer to clear up the mistakes in one or a few steps. Harlow (1959) found with rhesus monkeys that by judiciously arranging test patterns one could demonstrate important factors including

(a) how error factors are determined in individual instances,

(b) frequency of errors, and (c) the most likely order of errors factors in the training routine.

Lewis and Pask (1965), therefore, recommended that adaptive teaching machines be used which required that the student make errors so that the type of instruction needed next could be determined. This view opposed the Skinnerian view, in the sixties, that the student must be given programmed material in such a way that the least number of errors possible be made. The Skinnerians argued that programs resulting in many errors were poorly designed programs.

Failure of the Educational Revolution

Mechner (1965) discussed the reasons for the failure of an educational revolution to occur by 1965. The view of educators then (and now) was that programmed material was appropriate for rote material or drill work, appropriate for teaching facts or for remediation. Others thought that programming stifled creativity. Mechner pointed out that these views were realistic in terms of most of the programs educators were contacting. There were hundreds of programs that were developed in classrooms by non-experts. Mechner then pointed out that the flaws with most of these programs were similar in that the programs did the following:

1. Required the learners to write out irrelevant words omitted from the text.

2. Attempted to teach by rote, concepts which required the presentation of examples.

3. Failed to teach discriminations, generalizations, organizations, categorization and classification of the information presented.

4. Limited learner responses to one word or to multiple choice, instead of requiring explanations, definitions or descriptions, and

5. Were not developed in the appropriate medium or response modality.

Another reason for the slow advancement of programmed instruction was that it was easier to sell others the notion of programmed instruction by describing it as consisting of samll steps, active student

responses and immediate confirmation, instead of referring to
"the operational specification of behavioral objectives" or the
"techniques of behavior analysis" (1965), p. 503). The response
to this was that most persons took the small step, active response,
and feedback notions as being all there was to programmed instruc-
tion. They were not convinced that detailed knowledge of the
science of behavior was important in developing programmed materials.
The field of programmed instruction had attracted many persons with
no background in behavior analysis which resulted in low quality
materials. Another reason for the slow advancement was that it was
much cheaper to develop programmed materials consisting "of text
passages with many blanks than it was to produce programmed courses
based on operational specification of behavioral objectives, behav-
ioral analysis and behaviorally designed frame sequences which have
been subjected to several cycles of testing and revision until the
specifications are met." (p. 504) Mechner mentioned that in 1965 it
cost between $2,000 and $6,000 to produce one hour of top quality
material. This was about 20 times as high as the cost of developing
a comparable conventional textbook.

Program Statistics in the Sixties

The most programmed material in 1965 was available regarding
mathematics, (Evans, 1965) and English (Markle, 1965; Lane, 1965).
The major programming areas in the middle 1970's will be discussed
later in this paper.

During 1961–1963 math programs were the most widely used pro-
grams. The cost of each program was between $10 and $15. In 1961

and 1962, 73 percent and in 1962-63, 79 percent of the users employed programmed instruction without a machine (Eigen, Clayton and Hanson, Note 16).

In 1962 and 1963, the Center for Programmed Instruction sent a questionnaire to over 14,000 school systems in the United States listed by the Office of Education. The questionnaire was designed to obtain information regarding familiarity and use of programmed materials. In 1962, of the 1,830 questionnaires returned, 1,621 indicated non-use of programmed materials. In 1963, of the 1,686 returned, 1,073 indicated non-use. All of the non-users, though, were familiar with the terms "teaching machines", "programmed learning", and "programmed instruction" (Eigen, Clayton and Hanson, Note 16).

Programmed Instruction in Industry

In 1960 there was nearly no programmed instruction in industry. But, in 1963, a survey made by the American Telephone and Telegraph Company (Shoemaker and Holt, 1965) indicated that forty companies of a sample of 277 indicated having an in-company facility for developing their own programs. To most of these companies, programmed instruction appeared to be extremely powerful as a training method.

The survey was sent to the 500 largest companies in the United States. Seventy-five percent of these companies, or 277, responded. Twenty-five percent of the respondents using programs employed the programs with 200 or more of their workers. Sixty-nine percent of all the programs used dealt with job procedures. Seventy-seven percent of the companies surveyed used programmed materials during working hours, where release time occurred on the job.

Advantages given by Shoemaker and Holt for use of programmed instruction in industry were the following:

1. The self-pacing aspect of programmed instruction.

2. Scheduling flexibility – with conventional training it was usually required that large classes be formed to lesson instructor expenses; this was very difficult to arrange in large companies.

3. Quality control- when several instructors were used to teach the same material, there were always differences in content. One instructor was likely to modify content each time he or she taught the course. Programmed materials prevented this.

4. Industries required highly standardized practices where operations must be uniform from one branch to another. Limitations of programmed instruction in industry mentioned by Shoemaker and Holt were the difficulties in obtaining appropriate programs, the initial high cost of program development, limited application of the programs if the trainee number was small, lengthy development, and the subject matter instability if the job procedures frequently changed.

One company survey reported tremendous advantages of using programmed training materials. The Martin Company claimed that it cost only $3.75 to train each employee which was at least a $30 savings per employee for over 1500 employees.

The characteristics of the programs used in industry are as follows. Of the programs developed in-house, 82.2 percent were linear while only 6.6 percent were branching programs. Approximately 68.5 percent required constructed responses while 8.6

percent were multiple choice, 79 percent used programmed texts, and 27.6 used teaching machines.

Many of these industrial programs had been validated or evaluated in some manner. Very few of the companies surveyed used only a subjective approach to evaluation. Among the companies which field tested their programs, there were three basic approaches.

1. Assessment of a program against a criterion examination or other measure,

2. Comparison of a program with another training course in terms of criterion examination, and

3. Comparison of a program-taught group with a control group which generally received no training.

Programmed Instruction in Federal Agencies

In 1965, Bryan and Nagy from the Office of Naval Research reported that over 382 programs existed in federal agencies. Most of these programs were developed in-house by the agency. Very few of these programs had been objectively evaluated.

Program Construction in the Late Sixties and Early Seventies

The late sixties and, particularly, the seventies resulted in the development of highly sophisticated programming techniques. Not as much experimental research was conducted except in terms of program validation. Basically, the steps involved in programming became highly specified and detailed. These steps were based on findings in the fifties and early sixties by Skinner, Holland, Crowder and so forth.

Broudy (1963) described the important procedures of instructions as (a) getting student control, (b) presenting the learning task, (c) inducing trial responses, (d) correcting trial responses, and (e) instituting test trial for evaluation.

Hartley (1972) specified steps every programmer should follow. They were:

1. Precisely specifiy program objectives.

2. Precisely specify prior knowledge and skills of the target population.

3. "Painstakingly" analyze material to be taught and skills to be acquired.

4. From these analyses, determine the optimum teaching sequences, appropriate teaching strategies and appropriate presentation methods.

5. Test the program on the target population sample.

6. Revise the program.

7. Retest the program.

8. Revise and retest as much as necessary.

Ducan (1972) pointed out that the experiments which deliberately disproved the theories of Skinner (Pressey and Kinzer, 1964) Crowder (Senter et al., 1964; Kaufman, 1963; Biron and Pickering, Note 17; Duncan and Gilbert, 1967) and mathetics (Davies, Note 18) actually contributed to programmed instruction. While these studies showed that some features of programming style are superficial, they also show that defining and ordering what the student must master through

task analysis was common to all programming. Miller (1962b) defined a task as any group of activites performed at about the same time or in close sequence, and sharing a common work objective. Duncan (1972) showed that every step and behavior required to complete a task should be diagrammed using flow diagrams or charts.

Gagne (1965, 1969) recommended that tasks be looked at and programmed in terms of the behavior categories of response differentiation, association, multiple discrimination, behavior chains, class concepts, principles and strategies. Leith (Note 19) suggested a taxonomy of learning where types of learning, response intergration, trial and error learning, learning set formation, concept learning, concept integration, problem solving and learning schemata. Fitts (1964) argued that organized behavior generally referred to as skilled or expert behavior is probably a hierarchy of subroutines which are not necessarily repeated in the same hierarchial order for each task.

Davies (1972) recommended that a task analysis should result in the following products:
(a) measureable objectives, (b) descriptions of behaviors necessary for mastery, and (c) detailed sequences to be followed presenting the material.

In terms of presentation strategies in programming, Davies (1972) suggested that a frame should meet the following requirements:

1. Interest and stimulate the student.

2. Force the student to emit the desired response.

3. Present stimuli such that the student is forced to emit novel responses.

4. Confirm the appropriateness of the response, and

5. Contain interesting or enriching auxiliary material.

Davies also discussed presentation strategies for programming. He argued that criterion frames should be written first "which release the behavior after it has been finally established and rehearsed" (1972, p. 107). No prompts should be used in criterion frames. An example of a criterion frame would be:

List the principles of behavior.

1. _____

2. _____

Once the criterion frames were written, teaching frames could be constructed. The frames should "introduce and demonstrate all the essential behavior of mastery." (p. 108) Discriminative stimuli were used in these frames along with observing stimuli and instructional stimuli. After the teaching frames were written, rehearsal frames were generally written. The prompts used in practice or rehearsal frames were usually more generalized than those in the teaching frames. After the above frames were completed Davies recommended three methods for making the frames more "distinctive and memorable".

1. Gradually fade prompts.

2. Use stimulus generalization or group together stimuli with similar elements.

3. Use shaping techniques.

Skinner (1968) wrote that "shaping behavior by progressive approximations can be tedious" (Markle, 1969, p. 58). Markle suggested

that priming might be used instead of shaping. The simplest
type of prime mentioned by Skinner (1968) is where the student is
required to copy all or part of the text. Another type of prime
discussed by Skinner (1957), which is used in teaching language or
phonics, was the echoic response. Another type of prime is the
modeling of the appropriated response. A prime, in ohter words,
tells appropriate behavior as opposed to a prompt which merely
hints at the appropriate response.

Davies (1967) and Miller and McKean (1964) completed research
relevant to the most appropriate grammatical structure to use in
programming constructed response sequences or in multiple choice
formats. Burth (1955, 1959), Tinker and Pateson (1949), Luchiesch
and Moss (1942) made varied recommendations for appropriate type
style, type forms, type boldness, type size, space between lines,
length of line and color of paper and print.

Markle (1969) suggested that a matrix be complete to make sure
all relevant information was included in the program such that
subject matter was listed on one axis and target behaviors were
listed on the other axis. Below is a sample matrix.

	Concepts		
Behaviors	Round	Triangular	Square
Define, when given term			
Give examples, when given term			
Label, when given non-examples			

Many suggested that programs be arranged in alogical sequence. It had often been shown, though, that when programs were scrambled and frames were presented in random sequences, no difference in learning occurred (Popham, 1969; Anderson, 1967). It may be the case, though, that logical sequencing is necessary in some areas of teaching, such as in reading or arithmetic. This will be discussed later in the Becker, Englemann and Thomas section.

Algorithms

Davis (1972) discussed the use of algorighms in programming. "An alogrithm is an exact prescription or recipe leading to the achievement of a specific outcome." (p. 120). Much like flowcharting is a logical progression toward the terminal behavior, an alogorithm begins with general situations and ends with specific ones. These situations are presented so that the students respond to one statement, then to the next relevant statement, and so on, until the problem is solved. Three formats were generally used in programs employing alogrithms.

1. Linked statements – series of questions where learners were asked to look at relevant conditions. They used for small self-contained tasks.

2. Visual-type diagrams or whifs – illustrated chains of causual events. They were used for people having difficulties with words or for psycho-motor tasks.

3. Decision tree diagrams – showed relations between conditions. They were generally used for classification tasks or diagnosis problems.

The use of algorighms had several advantages over the traditional prose style usually used in programming.

1. The student was forced to make several decisions about limited facts.

2. Each decision was related to a very specific issue. Problems of outcome and relevancy were kept to a minimum.

3. In writing through a logical tree the student needed not remember his/her earlier decisions, as usually was required with the traditional prose approach which often resulted in confusion.

Mathetics

A mathetics program was designed much like other programs in that it began with detailed task and behavioral analyses. Gilbert (1962a and 1962b) emphasized that the analysis should center on student activities rather than on the coverage of subject matter. In preparing the program, the analyst was to define terminal behavioral objectives. Gilbert's approach utilized behavior chains, discriminations and generlizations. Markle (1969) claimed that "the units into which a mathetist breaks a task for instructional purposes are of the sort—they are supposed to be unitary acts that result in a perceptible effect. The teaching exercise that the matheticist will construct will reflect the largest set of operants that the student can handle in his operant span" (p. 160). Matheticists also emphasized step size, in that they initally overestimated the size of the step, because it was more easily determined when steps were too large as opposed to too small. Exercises were completed by students and revised until errors were eliminated. The overall mathetical approach was, first, to demonstrate the desired

operant to the student, then to prompt the operant, and finally to eliminate the prompts. Mathetics also included the procedure of "backward chaining" or shaping first the terminal behaviors required. According to Pennington and Slack (1965), a student was only given feedback regarding the correctness or incorrectness of his or her answers at the beginning of the program, to "give him confidence in his own correct behavior" (p. 304).

Construction of Branching Programs

The steps in constructing intrinsic or branching programs were very similar to the steps involved in linear programming. Walther and Crowder (Note 20) emphasized that first the desired behavior must be analyzed; second, behavioral objectives in conjunction with a task analysis. Next, the proposed topics should be compared with and analyzed in terms of the behavioral objectives. The program should then be outlined in logical sequence including the concepts to be taught and the definitions of terms.

Walther and Crowder (Note 20) suggested the following, somewhat vague, rules for writing multiple choice questions:

1. Test the central points.

2. Do not deceive the student.

3. Require the student to use program information when answering questions.

4. Write answerable questions based on program material.

5. Never make the student guess the answers.

6. In the stem of the question, include all the words which are common to all the alternatives.

7. State the questions in positive terms.

8. Make the alternatives logically consistent with the stem of the questions.

9. Make the alternatives similar in grammar, length, content, and degree of precision.

10. Make the alternatives as brief as possible.

11. Make the alternatives plausible.

Markle (1969) suggested that although multiple choice frames have seemed inappropriate to Skinnerians, they are appropriate when "there are a limited number of plausible choices for the correct answer, and especially when the design of the frame produces too many wild guesses among wrong dimensions...It lends itself beautifully to teaching overlapping concepts, multiple causes and multiple effects' (p. 103).

Becker, Engelmann and Thomas

Becker, Engelmann and Thomas (1975) recommended that educational instruction be required to include the following components which would (a) motivate the students, (b) force the students to attend to task, (c) present discriminative stimuli, (d) define response requirements, (e) secure student responses, (f) reinforce appropriate responses, (g) correct inappropriate, and (h) evaluate student mastery.

Becker et al. found that programmed tasks should consist of the presentation of a task stimulus such as a picture of a flower followed by a stimulus direction such as "look at the flower". This should be followed by a response direction such as "write its name", and the task response, the written word "daisy". They also did claim that both stimulus prompts and response prompts

should be used, when needed, after the stimulus directions and response prompts, with the prompts being faded as soon as possible. They added that programming a "set of related concepts should be cumulative" (p. 175).

Englemann (1969) suggested that material is properly programmed when a teacher is able to correct a mistake only by referring to earlier material from the program. He advocated that the programmer perform conceptual analyses prior to task analyses when programming. A concept is defined as "a set of stimulus characteristics common to other instances of a specified universe" (Becker et al., 1975, p. 257). When analyzing the structure of a concept, Becker et al. wrote that the programmer must look for characteristics shared by two or more concepts and look for concepts easily confused with each other. Generally, Engelmann (1969) proposed a logical approach to determin which discriminations should be taught in a program.

Becker et al. required that in teaching concepts:

1. Several examples non-examples (postive and negative instances) of the concept be presented to the student.

2. The examples or instances should be chosen "so that all possible instances possess all relevant concept characteristics (p. 69).

3. Irrelevant characteristics within all these instances must vary.

4. The program must be cumulative or must review previously taught material.

When a concept had already been taught or was assumed learned by the student, Becker et al. recommended that rules be taught and then examples be used to identify rules, similar to Gagne's ruleg system. Data indicate that rule learning is more effective than discovery learning. (Note 21).

When problem-solving skills were to be taught in a program, Becker et al. stated that problem analysis skills also be taught. Without being able to analyze problems, stimuli which indicate the most appropriate solution strategy would not be recognized by the student.

The authors wrote that concepts should be divided into concept domains which include concepts about each of the following: (a) objects, (b) object properities, (c) object relationships in space, (d) events in time and space, (e) relationships among events in time and space. (p. 146)

Perhaps the most detailed analysis of steps to follow when programming was presented by Becker et al . They required that a preliminary set of program objectives be written followed by:

1. An anlaysis of the preliminary objectives "into sets of component terminal skills that involve common concepts and operations" (p. 160).

2. A restatement of the objective(s) as sets of related tasks which the student can perform.

3. An analysis of the terminal objectives into component skills that involved related sets of concepts and operations.

4. A specification of the "general-case formats for each of the grouping identified in Step 3" (p. 163).

5. An analysis of the "task formats for prerequisite skills" (p. 166).

6. The use of the information derived "to construct a program sequence chart for terminal objectives, component skills, and prerequisite skills" (p. 166).

7. "Sets of the terminal component, and prerequisite tasks sharing a common task format, as determined by analysis of which pairs of concepts and/or operations lead to tasks that are more alike and that are more difficult because of their length" (p. 166).

8. The modification of "initial teaching concepts (or apparatus rules) as needed to reduce shared characteristics or to simplify them" (p. 167).

9. The use of the "basic principles for teaching concepts and operations to produce and sequence task"(p. 169).

The use of the "basic principles for teaching concepts and operations to produce and sequence tasks" (p. 169).

The Direct Instruction Model was described by Becker and Engelmann (1975, 1976). The effectiveness of the Direct Instruction Model in teaching reading and math and language was demonstrated in the University of Oregon Follow Through Project (Note 22). The results of this study, which was completed in 1977, compared several models of instruction used in 139 communities over nine years for kindergarten through third grade. The models in the Nationa Evaluation were:

1. The Open Classroom Model.

2. The Cognitively-Oriented Curriculum Model.

3. The Bank Street Early Childhood Education Model.

4. The Responsive Education Model.

5. The Tucson Early Education Model.

6. The Parent Education Model.

7. The Language Development (bilingual) Model.

8. The Behavior Analysis Model (University of Kansas).

9. The Direct Instruction Model.

The Behavior Analysis Model differed from the Direct Instruction Model in that the Direct Instruction Model was a logical presentation of subject matter to the student. The Behavior Analysis Model did not necessarily assume a logical presentation of the materials. Becker and Englemann attributed the success of the Direct Instruction Model to the "technological details, the highly specific teacher training, and careful monitoring of student program" (Becker, 1977, p.1) which seemed to imply that the Behavior Analysis Model did not include these areas.

The results of the University of Oregon Follow Through Project indicated that disadvantaged students performed better after exposure to Direct Instruction than students in any other model as shown by Basic Measures, Cognitive Measures, Affective Measures, the Metropolitan Achievement Test (MAT), MAT Total Reading, MAT Total Math, MAT Spelling, and MAT Language. The Behavior Analysis Model proved to be the second most effective teaching model based on the Affective Measures, MAT Total Reading, MAT Total Math, and MAT Spelling.

Program Evaluation

The emphasis on program assessment and evaluation was initiated in the late fifties and early sixties. Criteria for program assessment were first developed by the Joint Committee on Programmed Instruction

(Note 23). They recommended that both predictive and validating criteria of effectiveness be used. Possible validating criteria suggested by the committee were to obtain data regarding the program: (a) error rate, (b) pre-and post-test gains, (c) changes on indirect motivation and transfer, and (d) persistent, permanent or generalized effects. The committee also proposed that internal and external program information in terms of program appropriateness, effectiveness and practicality be used if assessing programs. The Committee specified that to evaluate a program, behavioral objectives must first have been written. The Committee warned that the programmer consider several factors in designing instruments for measuring instructional objectives. They were the following:

1. Definitions of behaviors the programmer wished to shape.

2. Problems of item sampling when developing a test to sample behaviors to be learned.

3. The test's origin (ad hoc) or standardized).

4. Problems of specifiying the level of performance.

5. Reliability and validity of the test.

6. Question or type of criterion of program affectiveness to use

The Committee made general recommendation for reporting program effectiveness. They were that:

1. Effectiveness data should be based on an experimental study under specified conditions.

2. Results should be documented in a technical report meeting standards of experimental reporting.

3. All claims regarding the program effectiveness should be

supported by evidence from the technical reports.

Hartley (1972) proposed that in validating a program on the basis of gains in pre- and post-test scores, the test must first be validated, be found reliable and be objective. Green (1967) argued, though that "evaluation will not be achieved through a classical approach to measurement, but rather, that it will be made in terms of some essential economic facts. A program must be assessed in terms of what it proposes to teach, weather, in fact, it does teach, and how much it costs to teach" (p. 130). To empirically test the program, Hartley recommended both external and internal validation. Internal testing would include developmental testing with imdividuals to detect serious program defects. The next step of evaluation suggested by Hartely, was field testing with a larger number of students. Measures usually looked at with field tests were pre- and post-test and follow-up croes, errors made on tests and on frames, time taken subjective comments from students. Ninety percent accuracy on the post-test was desirable, according to Hartley, but the programmer must control for variables such as the tests being invalid or unreliable. If only post-test scores were looked at, it might be the case that the students knew 85 percent of the material before the program was administered, or the students might have spent far more time with the program than necessary to learn the material.

Horne (1964) pointed out that pre-test, post-test evaluations of programs were not sensitive to the following program aspects: (a) faults in the subject matter, (b) faults in organization, (c) faults in step size, (d) over- or under-prompting problems,

(e) over- or under-reviewing, (f) boring presentation of material, and (g) lack of illustrative material.

In terms of revision of programs based on thest data, little research has been done. Thomas (1966) used the pre-post gain ratio as a basis for decision-making. His decision-making flowchart was based on gains either above or below 60 percent. He recommended specific types of revision for gains above 60 percent and other types for gains below 60 percent.

Hartley (1966b) and Ellams (1969) recommended that each person in the field testing sample be asked to comment on each frame and give suggestions for improvement. Leith (Note 19) recommended administering validated attitude scales after each subject's completion of the program.

Hartley (1966a) reviewed the results of 112 studies comparing programmed instruction with traditional instruction. One hundred and ten of these studies recorded test results. Of thes 110, the programmed instruction groups scored significantly higher than the controls in 41 of the cases. There were no significant differences, in 54 of the studies, between programmed instruction and control groups. Fifteen of the programmed instruction groups scored significantly lower than the conventional instruction group. Hartley concluded that these findings were limited because some of the experiments had a very small sample, some had very short programs, and some studies did not detail the research design used.

Recent Program Data

Hendershot (1973) compiled an annotated bibliography including all published programmed materials. The references were organized according to topic areas and publishers. The author of the present paper condensed Hendershot's information and converted it to numerical data.

It was found that there are 84 areas in which programmed materials have been published by 267 publishers, resulting in a total of 4,435 published programmed texts and 132 mechanical programming devices. The bibliography indicated that 30 percent of the programmed texts were·published from 1960 to 1965, 26 percent were published from 1966 to 1969, and 54 percent were published between 1970 and 1973. Of the texts 10 percent, or 426, provide validation information, three percent, or 124, have pre- and post-tests available, while .5 percent, or 28, have only post-test scores available.

Of the texts that have been validated, the area of highway construction has 100 percent of its texts validated. Calculus has the next highest percentage of validated texts with 81 percent, followed by driver training and insurance with 50 percent validation. ·Less than 50 percent of the topic areas have any validated texts.

Mellan (1960) presented data regarding the number and types of patents given for programmed or programming devices, apparatuses, or machines. In 1936 there were 697 patents for programmed materials,

mostly mechanical, in 16 areas.

The Present Validation Study

The present programmed text was designed to incorporate components of programmed instruction, previously discussed, which were most relevant to the material to be covered, and to the objectives of the text. The following components were incorporated into the programmed text, Behavioral Counseling of Alcohol-Related Problems: (a) overt instead of covert response requirements (Holland, 1965), (b) immediate feedback following a response (Skinner, 1960). (c) precisely specified program objectives (Hartley, 1972), (d) priming (Markle, 1969), (e) small step size (Markel, 1969), (f) presentation of examples and non-examples where appropriate (Becker et al, 1975; Thomas et al, 1963), (g) use of generative sets to teach subject matter (Becker & Engelmann, 1979), (h) logical presentation of subject matter (Becker & Engelmann), (i) programming of most useful skills first, second most useful skills next, and so on (Becker & Engelmann, 1979), (j) cumulative programming where appropriate (Becker & Engelmann, 1979).

The content of the program frames was primarily based on research and publications in the area of behavioral treatment of alcohol problems by Miller (1976), Miller and Mastria (1977), and Sobell and Sobell (1978). Behavioral assessment of alcohol problems content was primarily based on research presented in Ciminero et al. (1977) and Mash and Terdal (1977).

II. Method

Subjects. The subjects were divided into two groups, A and B. Group A participated in Phase 1 of the experiment and consisted of seven male and five female volunteers. Five of the volunteers were undergraduates at Western Michigan University, four were graduate students at Western Michigan University, and three had Masters Degrees. All of the subjects were either working in the human service field or were enrolled in human service degree programs including psychology, social work, teaching, or counseling and personnel.

Subjects in Group A were recruited via posted notices in the human services departments at Western Michigan University, and via word of mouth through the university and human service organizations. Nine subjects were promised $50 upon completion of their participation in the study. Three of the subjects working in the human service field volunteered to participated for no monetary reimbursement.

Group B participated in Phase 2 and consisted of six females and four males. The subjects were all currently enrolled in the Specialty Program in Alcohol and Drug Abuse, a program for students enrolled in masters or doctoral programs in psychology, sociology, counseling and personnel and social work at Western Michigan University. The students were also enrolled in the Specialty Program in Alcohol and Drug Abuse treatment seminar as part of the specialty requirement.

Students in Group B were required to participate in the study, although, they had the option of either dropping or using the two

post-test scores toward their overall course grade. Subject #2 in each phase of the study had participated in pilot studies for the program validation two and three years previously. Thirteen subjects began Phase 2. Ten completed Phase 2. All the subjects in Phase 1 completed the study.

Materials. Materials used in Phase 1 and Phase 2 of the experiment included one 50-item multiple-choice pre test, one 25-item and one 24-item multiple-choice post test (see Appendix A), a 125 page programmed text, Behavioral Counseling for Alcohol-Related Problems, designed and written by the experimenter, and an AB Dick Latent Image Marker. Pre- and post-test items were similar, but not identical in content, to the program frame items.

The programmed text covered the following topic areas related to alcohol problems, with one area per chapter: (a) antecedents to and consequences for drinking, (b) behavioral assessment, (c) behavioral contracting, (d) evaluation of behavioral counseling, (e) relaxation training, (f) systematic desensitization, (g) covert sensitization, (h) assertiveness training, (i) drink-refusal training, (j) occupational skills training.

A chapter, in the programmed text, consisted of several frames. A frame included one or two paragraphs of written information followed by one to ten multiple-choice questions over the information. For the study, the text was typed on ditto masters, so that latent image transfer sheets could be used with the correct answers to the program frame exercises. With the latent image technique, the emission

of a correct response, using a latent image marker, resulted in the appearance of a circle around the item. No circle appeared when an incorrect item appeared. An example follows.

An event which occurs after a person drinks alcohol, which may either increase or decrease future drinking is

    a. an antecedent

    b. a consequence (correct response)

    c. an assessment (incorrect response)

Procedure

Phase 1. Subjects in this phase participated in Group A. All subjects were required to read and sign informed consent forms (see Appendix B). Questions about the experiment were answered if they were not expected to bias the results of the study, after the subjects read the informed consent forms. A pre test was administered to each subject by the experimenter or a secretary. Each subject was then given the first half of the programmed text to take home and complete within one week. Upon the completion and return of the second half, a post test was administered over the content of the second half of the programmed text. Each half of the text was completed, by the subjects, in five to ten days.

With each half of the text, subjects were instructed to read and complete the text in the order in which the material was presented, and to comment on the clarity and content of the frame material and exercises.

Response accuracy was calculated for Group A on the program frame

exercises. The program frame exercises were revised based on the response accuracy or error analysis. Items where one or more subjects emitted an incorrect response were rewritten. Frame content was revised based on exercise error rates and written comments of the subjects.

   Phase 2. Phase 2 consisted of different subjects assigned to Group B. Informed consent forms were read and signed by the subjects in Group B (see Appendix B). Pre and post tests were identical to those used in Phase 1 and were administered using the same procedure except that pre and post tests were given to all subjects, at the same time, in a classroom setting. Students which missed class were given the test by a secretary as soon after class as possible.

   The first half of the revised test was given to each subject to complete in one week. A post test was administered one week later. The subjects had one week to complete the second half of the text and then take the second post test. Response accuracy was calculated based on Group B's responses to the program frame exercises.

   Pre tests, post tests, and the program fram exercises of both groups were initially scored by the experimenter, then by a reliability checker. Reliability was calculated (agreements/disagreements + agreements X 100%) and was found to be 100% for the overall pre and post tests for both groups and 99.7% for the program exercises for both groups.

III. Results

Mean pre- and post-test scores are presented in Table 1 for Group A and Group B. The 50-item pre test included 25 items covering the first half of the programmed text and 25 items over the second half. Thus, the 25 items over the first half of the text are labeled Post Test 1, while the 25 items over the second half are labeled Post Test 2. Overall pre-test scores were slightly, but not significantly higher for Group B, $t=.27$ (11)$p > .05$. Post-test scores for Group A were slightly, but not significantly, higher than the Group B scores, $t=-1.59$ (11) $p > .05$. Each group's overall post-test scores increased significantly over the pre test scores, $t=7.79$ (11) $p < .05$, $t=5.09$ (9) $p < .05$.

Table 2 presents the programmed text data. In Phase 1, prior to the revision of the text, Group A emitted responses to 126 (81.3%) of the 155 program frame exercises with 80% to 100% accuracy. Group A emitted responses to 29 (18.7%) of the 155 program frame exercises with 0% to 79% accuracy. After the program revision, Group B answered 146 (93.6%) of the program frame exercises with 0% to 79% accuracy. None of the exercises were answered with less than 50% accuracy by Group B, while nine exercises (5.8%) were answered with less than 50% accuracy by Group A.

Table 3 presents the percent accuracy of each subject in Group A and Group B on the overall programmed text. Mean scores for Group B 145.5 (93.9%) was significantly higher than the mean percent accuracy for Group A, 138.5 (89.3%), $t =$ (11) 2.79 $p < .05$.

Table 1

Mean Pre and Post Test Scores

	Group A		Group B	
	#	%	#	%
Pre 1	18.3	73.3	17.1	68.4
Post 1	23.3	89.3	22.3	89.2
Pre 2	17.4	69.7	19.1	76.4
Post 2[a]	23.3	96.9	22.8	95.0
Overall Pre	35.8	71.5	36.3	72.6
Overall Post[a]	46.4	94.6	45.1	92.0

[a] Post test 2 had only 24 items due to a typing error, thus, the overall post test only had 49 items as compared to the overall pre test with 50 items.

Table 2

Individual Response Accuracy on Programmed Text Exercises[a]

Subject	Group A		Group B	
	# Correct	% Correct	# Correct	% Correct
1	142	91.6	149	95.5
2	137	88.4	151	96.8
3	139	98.7	148	94.9
4	138	89.0	124/144	86.1
5	140	90.3	138	88.5
6	141	91.0	151	96.8
7	142	91.6	150	96.2
8	139	89.7	153	98.1
9	136	87.7	139	89.1
10	133	85.8	152	97.4
11	138	88.4		
12	137	88.4		
$\overline{X}$	138.5	89.3	145	93.9

[a]Subjects in Group A completed 155 programmed text exercises. Subjects in Group B completed 156 exercises.

Table 3

Percent Accuracy on Overall Pre Tests, Post Tests and Programmed Text

Exercises

	Group A			Group B		
Subject	Pre	Post	Text	Pre	Post	Text
1	56	98.0	91.6	78	98.1	95.5
2	76	93.9	88.4	94	98.0	96.8
3	78	95.9	98.7	60	83.7	94.9
4	70	95.9	89.0	54	91.7	86.1
5	80	91.8	90.3	68	91.8	88.5
6	66	89.8	91.0	64	93.9	96.8
7	80	87.8	91.6	88	93.9	96.2
8	78	89.8	89.7	80	98.0	98.1
9	60	81.6	87.7	70	85.7	89.1
10	72	100.0	85.8	70	93.9	97.4
11	78	98.0	88.4			
12	64	95.9	88.4			
$\overline{X}$	71.5	93.3	89.3	72.6	92.2	93.9

Table 4

Percent Accuracy on Program Frame Exercises[a]

Percent Accuracy	Group A		Group B	
	# Exercises	%	# Exercises	%
100	79	50.9	93	59.6
90-99	36	23.2	34	21.8
80-89	11	7.0	19	12.2
Total	126	81.3[b]	146	93.6
70-79	9	5.8	6	3.8
60-69	3	1.9	1	0.6
50-59	8	5.2	3	1.9
40-49	5	3.2	0	0.0
30-39	2	1.3	0	0.0
20-29	2	1.3	0	0.0
10-19	0	0.0	0	0.0
0-10	0	0.0	0	0.0
Total	29	18.7	10	6.4[b]

[a] Total number program frame exercises for Group A was 155. Total for Group B was 156.

[b] Numbers do not add due to rounding.

IV. ·Discussion

Post-test 2 scores were higher for both groups than the post test 1 scores for two possible reasons (see Table 1). The most obvious reason would be testing effects combined with the subjects' experience in answering the programmed text exercises, which were presented in the same format as the pre- and post-test items. The second reason focuses on the content of the second half of the programmed text. The various counseling techniques described in the second half of the text were similar, procedurally, in many aspects. The techniques covered were relaxation training, covert sensitization, systematic desensitization, and assertiveness training. Thus, the repetition of similar content over several chapters may have affected the post test 2 scores.

Pre-test scores were fairly high for both groups, even though subjects reported that they had had little previous contact with behavioral counseling material. Prior to the study, the programmed text was pilot tested. The programmed text and pre and post tests were quite different in the pilot study, because very long constructed responses were required for answers to test and text essay questions. Pre-test scores where constructed responses were required in the pilot studies were between 0% to 10% accuracy, using students enrolled in human service fields, or in other words, similar types of subjects to the present study. Rowntree (1966) states that the more prompts which are presented in a question, the higher the probabil-

ity that a correct response will be emitted. The multiple choice questions consisted of more prompts than the essay questions used in the pilot study, thus possible resulting in high pre test scores in the present experiment.

Percent accuracy in responding by Group A on the programmed text exercises perhaps was not accurately portrayed by the data. Due to problems with the quality of the latent image transfer sheets, several of the circles indicating correct responses did not appear when marked. It is unclear whether lack of immediate feedback affected the subjects' response accuracy. Also, correct answers were hand pasted in the programmed text for Group A. Occasionally, the wrong answer was pasted to a frame exercise, thus resulting in incorrect feedback to the subjects. Without the technical problems with the text in Phase 1, errors and response accuracy might have been different.

The revised text still contains 10 items (6.4%) which were answered with less than 80% accuracy. It appears that these items could be eliminated completely from the text because only one item per chapter is a high error item, with the exception of the assessment chapter. Deleting one item per chapter should not affect response accuracy on the other items. If the other exercises within each chapter were dependent upon a correct response being emitted on these high error items, the other exercises would also have evoked lower response accuracy. Thus, it is recommended that these high error items be eliminated from the programmed text prior to any further use or publication of the text.

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Appendix A

55

Internal Validity Pre Test

Please complete the following items regarding your personal data.

Age_____   Please check your year

Sex_____   Freshman_____   Senior_____

Race_____   Sophomore_____   Graduate
                                                               Student_____
Major or graduate program   Junior_____
                                                               Master's
_____   Degree_____

Circle one answer for each of the following questions.

1. After math class, during lunch, Eric said to himself, prior to
getting the whiskey bottle out of the trunk of his car at lunch, "I'm
going to get even with my math teacher for giving me a hard time in
class. She'll be sorry she teased me for not knowing the answer".
This is an example of

        a. a consequence for drinking
        b. guilt-related thoughts
        c. retaliatory thoughts

2. What is important to do prior to designing a treatment plan for
the excessive drinker?

        a. Ask the client a couple of questions about him/herself.
        b. Determine the antecedent and consequent events for his or
           her drinking.
        c. psychological testing

3. How should treatment goals be stated in a contract?

        a. In terms of the method of negotiation which occurred.
        b. In terms of the behavior to be increased or decreased in a
            particular situation.
        c. In terms of the consequences controlling the drinking behav-
            ior.

4. The setting of goals should not be based on which one of the fol-
    lowing?

        a. the motivation of the individual
        b. cooperation of significant others
        c. only what the client of individual desires

5. During relaxation training the individual is systematically in-

structed to

   a. tense and then relax one muscle or muscle group at a time.
   b. relax and then tense one muscle or muscle group at a time.
   c. only relax one muscle or muscle group at a time.

6. In systematic desensitization, the client and counselor should complete a list of

   a. fear-producing situations.
   b. situations which elicit relaxation.
   c. covert sensitization.

7. The general drink refusal training procedure is

   a. covert sensitization.
   b. behavioral contracting only.
   c. behavioral rehearsal.

8. What behaviors are <u>not</u> involved in effectively refusing a drink, generally?

   a. rigidity or smiling
   b. speaking loudly and firmly
   c. direct eye contact

9. Which of the following is <u>not</u> true?

   a. Questionnaires are often biased because they are based simply on the writer's views.
   b. Questionnaires often represent only one point of view.
   c. Questionnaires are rarely biased or intuitive.

10. Which of the following do social antecedents <u>not</u> include?

   a. the presence of withdrawal symptoms
   b. social pressure
   c. the absence of another person

11. Which of the following is not a type of list that the client would make for the covert sensitization procedure?

   a. events of unpleasant or aversive nature not necessarily involving drinking
   b. events of an unplesant or aversive nature involving drinking, specifically
   c. events which were particularly pleasant to the client in the past

12. Heavy drinkers who lack assertiveness or engage in inappropriate

·assertive behavior

    a. increase the probability of their drinking.
    b. decrease the probability of theri drinking.
    c. increase the probability of becoming assertive because they
       drink.

13. In systematic desensitization, relaxation and what else are com-
    bined in the first step of the training procedure?

    a. covert imagery
    b. extinction
    c. assessment

14. Which of the following is not a factor which a newly employed
    former drinker might have difficulty dealing with which might
    initiate excessive drinking?

    a. authority figures
    b. business travel
    c. a job well done

15. Why is evaluation often omitted from treatment by many counselors?

    a. It offers concrete proof that the therapeutic intervention
      by the counselor moved the client to a higher level of func-
      tioning.
    b. The client who uses evaluation techniques will come to understand
      the control he or she has over his or her own behavior, so that
      he or she is less apt to blame hidden forces for setbacks
      in treatment.
    c. Its importance is not fully understood by the client or ther-
      apist.

16. Which of the following is <u>not</u> taught in drink-refusal training?

    a. offering an alternative response
    b. maintaining the same topic of conversation
    c. requesting a change

17. Which of the following is <u>not</u> included in the systematic desen-
    sitization procedure?

    a. behavioral contracting
    b. maintenance
    c. negative self-reference thinking

18. John would like to condition an aversive response to the taste,

a. ask an attractive woman to go out on a date
b. smile at a woman
c. look at a woman from a distance

25. The item at the bottom of his hierarchy would be

a. ask an attractive woman to go out on a date
b. smile at a woman
c. look at a woman from a distance

26. Drink-refusal training involves

a. relaxation training
b. assertiveness training
c. covert sensitization

27. Which of the following is not true about behavioral contracting?

a. All the possible alternative treatment techniques for the client should be specified in the contract.
b. A treatment technique should be specified for each short and long-term goal
c. The treatment techniques specified in the contract should be renegotiable at any time during treatment.

28. Which of the following is true about assertive behavior?

a. Assertive responses are longer than nonassertive responses.
b. An assertive person gives in by agreeing with something with which she or he does not agree.
c. It involves learning to never request another to change or modify his or her behavior.

29. An event which occurs after a person drinks alcohol which may either increase or decrease future drinking behavior is

a. an antecedent
b. a consequence
c. an assessment

30. Which of the following is not an example of a short term goal?

a. To be abstinent by the end of the twelfth month.
b. To drink not more than three drinks during the next week.
c. To lose one pound per week for the frist month of the diet.

31. Had a hard day at work and feel angry and tense. Which type of antecedent control is this?

a. physiological
b. cognitive
c. emotional

smell, and presence of alcohol. Which procedure should his counselor teach him?

   a. systematic desensitization
   b. covert sensitization
   c. extinction

19. Which of the following is <u>not</u> an emotional antecedent to drinking?

   a. thoughts such as "I'm gonna get even with him".
   b. excitement
   c. anxiety

20. Which of the following would most likely <u>not</u> be measured when assessing drinking behavior in a simulated setting?

   a. number of drinks ordered ina specified period of time
   b. blood alcohol level
   c. magnitude of the sips of alcohol taken

21. Which of the following is true?

   a. Treatment goals should be determined only by the therapist.
   b. Treatment goals should be determined only by the client.
   c. Treatment goals should be determined by the client, therapist and relevant others in the client's life.

22. "Let your muscles start to relax....just let go....and concentrate on that feeling, what it feels like when it is all tensed up, and then as you start to let go of the muscle....how good it feels when you start to relax that muscle....let the muscle go....let it relax more and more....the muscles in your fingers, and your hand, and in your forearm....let those muscles go....

In which of the following techniques is the above technique used?

   a. assertiveness training
   b. covert sensitization
   c. self monitoring

23. To assure that the client is relaxed she or he should be asked

   a. to stand up when relaxed.
   b. to shout, "I'm relaxed".
   c. to lift a finger.

24. A male with a phobia to females could design a hierarchy with his counselor as a first step in eliminating his phobia. What would be the most likely item to be on the top of the hierarchy?
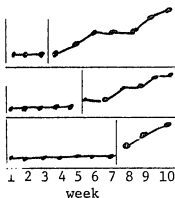
32. Vivid images of vomiting and nausea are used in which procedure?

   a. covert sensitization
   b. occupational skills training
   c. systematic desensitization

33. As with long term contracting, short-term goals, in a contract, should be negotiated between the client and counselor and

   a. be identical to the long-term goals specified.
   b. be stated in terms of behavior to be increased or decreased in a particular situation.
   c. be specified only in an unwritten contract.

34. In concluding an interview, the client should have skill in

   a. asking questions about absenteeism
   b. making final statements
   c. mention police records he or she may have

35. When would a reversal design be inappropriate to use when a drinker is attempting controlled drinking?

   a. when he or she is on the verge of divorce
   b. when he or she is not working or living with anyone
   c. when drinking was not harmful prior to treatment

36. Which of the following is not included in the definition of aversive situational consequences?

   a. decreases in the pleasantness of the situation or surroundings
   b. decreases in the unpleasantness of the situation
   c. increases in the unpleasantness of the situation

37. Which of the following does not need to be practiced at home by the client?

   a. assertiveness
   b. relaxation
   c. evaluation

38. After training, the word "calm" should elicit

   a. sensitization
   b. appropriate assertiveness
   c. relaxation

39. The purpose of self monitoring is

   a. to evaluate only assertive behavior.
   b. to evaluate only drinking behavior.

    c. for the therapist and client to become more familiar or
       sensitive to his or her behavior.

40. Which is <u>not</u> an evaluation design used with behavioral techniques?

    a. multiple baseline design
    b. control group design
    c. post test design

41. Small steps should be used with which of the following techniques?

    a. multiple baseline design
    b. control group design
    c. post test design

42. Having thoughts of guilt for <u>not</u> completing all the work during
the day is an example of which type of antecedent control?

    a. cognitive
    b. emotional
    c. situational

43. The difference in degree of anxiety produced in each hierarchial
situations should be

    a. small
    b. large
    c. moderate

44. The purpose of attaining reports from significant others regard-
ing the client's behavior is to

    a. obtain a reliability check to be sure that the client's self
       reports or self monitoring data are not intentionally or un-
       intentionally inaccurate.
    b. determine if the client is actually self monitoring.
    c. determine if the client is carrying out the treatment pro-
       cedure.

45. The purpose of relaxation training is for the individual to learn

    a. to alleviate his or her tension and anxiety without drinking
       alcohol.
    b. to produce tension as a learning experience.
    c. assertiveness.

46. If the purpose of treatment is for the treatment effects to gen-
eralize to several other behaviors of the client, which would
be the least appropriate evaluation design?
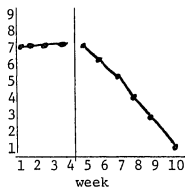
    a. multiple baseline design

b. control group design
c. reversal design

47. In which situation should evaluation data <u>not</u> be collected?

    a. during treatment
    b. prior to treatment
    c. data should always be collected

48. Which of the following is <u>not</u> a positive cognitive consequence?

    a. increases in negative thoughts
    b. decreases in negative thoughts
    c. increases in positive self-reference thoughts

49. Long term consequences of drinking are generally

    a. positive
    b. aversive
    c. retaliatory

50. How often should a client practice relaxation in a quiet location?

    a. once a month
    b. once a week
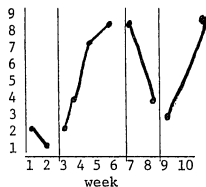   c. at least three times per week

Post Test #1

1. Which of the following is <u>not</u> a situational antecedent?

    a. physical pain
    b. time of day
    c. the presence of a beer advertisement

2. Which of the following represents a multiple baseline design?

a.   b.   c.

3. Which of the following is <u>not</u> a problem with inventory or questionnaire methods of assessment of drinking behavior?

    a. Sex differences in responding on inventories has generally been determined.
    b. Factor scores, component behaviors and specific situations have not been examined with inventories.
    c. Self-report scales have demonstrated short-term, but not long term reliability.

4. The purpose of self monitoring is

    a. to evaluate only assertive behavior.
    b. to evaluate only drinking behavior.
    c. for the therapist and client to become more familiar or sensitive to his or her behavior.

5. Which of the following is <u>not</u> related to the control of drinking behavior?

    a. antecedent events
    b. positive consequences
    c. behavioral assessment

6. Which of the following is <u>not</u> a positive cognitive consequence?

    a. increases in negative thoughts
    b. decreases in negative thoughts
    c. increases in positive self-reference thoughts

7. Which of the following is not necessary to include in a behavioral contract?

    a. The exact negotiation procedure which will be used between client and counselor.
    b. The procedure for evaluating client progress.

    c. The termination date of long term goals.

8. Which of the following is <u>not</u> a purpose of behavioral contracting?

    a. To train goal-directed behavior.
    b. To keep counseling sessions on target.
    c. To assess the client's alcohol consumption.

9. What is the value, to the client, of using evaluation techniques?

    a. That it will be demonstrated that the therapist has total control over the client's mental health.
    b. That she or he has control over his or her own behavior.
    c. That it will be more apparent that hidden forces control behavior.

10. Margaret had five or six martinis and then beat up her son when he had the television too loud. The next day she said to herself, "I'm so ashamed. I'm so sorry. I'll never hit him again." This is an example of

    a. retaliatory cognitive behavior
    b. guilt-related cognitive behavior
    c. negative self-reference thoughts

11. The Drinking Profile is

    a. a questionnaire primarily related to drinking and assertiveness.
    b. a questionnaire primarily related to drinking and marital happiness.
    c. a general questionnaire which assesses general patterns of drinking.

12. The client and counselor agree that John will record the number of times he initiates an argument with his spouse each day. This is <u>not</u> an example of which of the following?

    a. a behavioral contract
    b. self monitoring
    c. retaliatory thoughts

13. Which of the following is an example of long-term negative con-
    sequences for drinking?

    a. gastritis
    b. vomiting
    c. antecedent events

14. Which of the following categories is not included in social skills
    inventories?

    a. marital skills
    b. cognitive skills
    c. self expression and assertiveness skills

15. Which of the following is generally not involved in the evalua-
    tion procedure?

    a. The comparison of post treatment data with pre-treatment data.
    b. The comparison of pre, during, and post treatment data.
    c. The comparison of one client's data with the counselor's
       subjective views of the changes in the client's behavior.

16. A control group is generally given

    a. no treatment.
    b. treatment different from the experimental group.
    c. self-management training.

17. Dennis was regerred to counseling by his teacher. When each was
    interviewed, Dennis and his teacher differed significantly re-
    garding Dennis' drinking behavior. In general, the teacher said
    Dennis had a severe drinking problem, while Dennis said that the
    teacher disliked him and his brother, and was therefore exagger-
    ating. What should the therapist do?

    a. Assume the teacher is correct.
    b. Assume Dennis is correct.
    c. Ask a third person for a reliability check.

18. Which of the following is not a positive social consequence for
    drinking?

    a. Friends saying, "You're really fun to party with".
    b. Being able to make a public speech without constantly stut-
       tering.
    c. Drinking to attain the consequence of thinking positive self-
       reference thoughts.

19. Which of the following is not a reason to administer the breath
    test as an assessment technique?

    a. To determine a fairly accurate quantitative representation

of the client's blood alcohol level.

    b. To obtain a reliability check to be sure that the client's self reports or self monitoring data are not intentionally or unintentionally inaccurate.

    c. To determine the client's level of intoxication if he or she is attempting controlled drinking.

20. Which of the following is a goal in which it is likely that both the client and counselor will agree.

    a. To increase the number of times the client tells off his boss.

    b. To increase the number of times the client is appropriately assertive with his boss.

    c. To decrease the number of interactions the client has with his boss.

21. Which of the following would most likely not be measured when assessing drinking behavior in a simulated setting?

    a. number of drinks ordered in a specified period of time

    b. blood alcohol level

    c. magnitude of the sips of alcohol taken

22. Which of the following is an emotional antecedent to drinking?

    a. guilt

    b. crying

    c. fever

23. Which of the following more appropriately describes a reversal design? (Each letter represents a phase of the experiment.)

    a. ABAB

    b. ABCA

    c. ABCB

24. The setting of goals should not be based on which one of the following?

    a. the motivation of the individual

    b. cooperation of significant others

    c. only what the client desires

25. The presence of another person which functions as a stimulus for one to drink is

    a. a social antecedent to drinking.

    b. a physiological antecedent to drinking

    c. a situational antecedent to drinking

Post Test #2

1. How often should a client practice relaxation in a quiet location?

   a. at least three times per week
   b. twice per month
   c. once per week

2. Sally is asked if she would like a drink. Her reply, "Say you're looking good. What have you been doing?" This is an example of

   a. offering an alternative when asked to have a drink.
   b. changing the subject when asked to have a drink.
   c. requesting a change when asked to have a drink.

3. Which procedure should be used in teaching occupational skills?

   a. behavioral rehearsal
   b. covert sensitization
   c. breath testing

4. Which of the following is not a statement of the purpose of relaxation training?

   a. By learning to relax one will be able to ward off urges to drink before they become too strong.
   b. One will learn to become tense whenever one desires.
   c. One will be able to avoid and eliminate anxiety.

5. In the systematic desensitization procedure, the client and counselor should complete a list of

   a. fear-producing situations.
   b. situations which elicit relaxation.
   c. covert sensitization situations.

6. In systematic desensitization, relaxation and what else are combined in the first step of the training procedure?

   a. assessment
   b. extinction
   c. covert imagery

7. The pairings of feelings of sickness with relaxation occurs with which procedure?

   a. systematic desensitization
   b. relaxation training
   c. covert sensitization

8. Which of the following statements is false?

   a. An assertive person appropriately expresses his or her personal rights.
   b. An assertive person appropriately expresses negative emotions.
   c. An assertive person is morelikely to need to drink to excess.

9. The drink-refusal training prodedure is similar to which of the following procedures?

   a. behavioral contracting
   b. relaxation training
   c. assertiveness training

10. Which of the following procedures does not include relaxation training as an integral part of the procedure?

   a. assertiveness training
   b. covert sensitization
   c. systematic desensitization

11. Which of the following procedures does not include behavioral hierarchies?

   a. systematic desensitization
   b. relaxation training
   c. assertiveness training

12. Which of the following is not included in the systematic desensitization procedure?

   a. behavioral contracting
   b. maintenance
   c. negative self-reference thoughts

13. Which of the following does not become aversive to the drinker following covert sensitization?

   a. drinking behavior
   b. imagined scenes of drinking
   c. assertiveness

14. Nonassertive responses involve

   a. rigid posturing and the avoidance of eye contact of others.
   b. direct eye contact.
   c. longer verbal responses.

15. "Much better. Excellent, in fact. You were confident, forceful, and sincere." This is an example of

   a. the client being assertive.

b. the therapist giving feedback to the client.
c. relaxation instructions.

16. Which of the following is <u>not</u> a response that the person could emit in terms of drink refusal?

a. request a change
b. offer an alternative
c. take just one drink

17. Which statement is <u>not</u> true?

a. The drinking problem is often ignored by the employer, resulting in the firing of the employee for poor job performance.
b. Alcohol problems cause more waste in terms of industrial time and money than other disorders.
c. A person can be fired because he or she specifically has or has had alcohol-related problems.

18. Which of the following is an example of an assertive response?

a. "Please don't do that."
b. "Goddam it, cut it out..."
c. "I uh don't mind too much if you do that."

19. Which of the following is an example of a systematic desensitization hierarchy?

a. Giving a lecture to 500 people.
   Giving a lecture to 100 people.
   Giving a lecture to 50 people.
   Giving a lecture to 10 people.
   Giving a lecture to 3 people.

b. Giving a lecture to 3 people.
   Giving a lecture to 50 people.
   Giving a lecture to 500 people.

c. Giving a lecture to 50 people.
   Giving a lecture to 10 people.
   Giving a lecture to 500 people.
   Giving a lecture to 100 people.
   Giving a lecture to 5000 people.

20. After being offered a drink of wine, John said, "I'd rather have a cup of coffee". This is an example of

a. changing the subject.
b. offering an alternative.
c. increasing looking at the person.

21. Which is one of the first steps in the relaxation training procedure?

    a. Make sure the word "calm" or "relax" elicits relaxation.
    b. Ask the client to make him/herself comfortable.
    c. Tell the client to practice relaxation at home.

22. Which of the following is <u>not</u> a component of systematic desensitization?

    a. the presentation of anxiety-producing situations in hierarchial order
    b. covert sensitization
    c. entering real-life situations

23. The proper order of procedural steps during assertiveness training:

    a. roleplaying, instructions to the client, compiling a hierarchy list
    b. compilation of a hierarchy list, instructions to the client, roleplaying by the counselor, roleplaying by the client, feedback to the client.
    c. feedback to the client, roleplaying by the client, roleplaying by the counselor, instructions to the client, compilation of a hierarchy list.

24. Could one use a multiple baseline design to evaluate drink-refusal behavior?

    a. yes
    b. no

Appendix B

Informed Consent Form

I give my consent to participate as a subject in an experiment conducted by Sue Leiphart for her doctoral dissertation. I understand that she will be attempting to validate her programmed text, Behavioral Counseling For Alcohol-Related Problems for internal validity. Twelve volunteers completed the programmed exercises, as well as, pre and post tests for the first internal validity study. Based on these data, the text will be revised.

Thirteen students enrolled in the Seminar in Substance Abuse, Winter semester, 1980, will complete the revised text and pre and post tests for the second internal validity study.

Possible risks, as a result of my participation in the study, might include discomforts I might experience in completing the material if it has not been well programmed. I realize that names will never be associated with my test scores or error rates on the programmed ex- ercises. If the programmed materials are effectively programmed, such that my error rate is low, a benefit of the study for me is that the material will be easily and effectively mastered.

I understand that there is no way the data will be presented such that they can be idenfified with the individual subjects involved. An- onymity will be maintained throughout the duration of the study. Orig- inal data will be destroyed at the end of the study. I understand that Greg Blevins, one grader and Sue Leiphart will be the only persons allowed access to the raw data. I may refuse consent to allow my data to be used for the dissertation at any time during the study.

Subject Signature_____ Witness Signature_____

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