CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

A PROPOSAL FOR THE FULLY AUTOMATED TRAINING
OF BEHAVIORAL OBSERVERS USING PROGRAMMED
VIDEO TAPES

A field research project submitted in partial satisfaction
of the requirements for the degree of Master of Arts in
Psychology

by

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ABSTRACT

A PROPOSAL FOR THE FULLY AUTOMATED TRAINING OF BEHAVIORAL OBSERVERS USING PROGRAMED VIDEO TAPES

by

Fritz H. Böttjer

Master of Arts in Psychology

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The field project described in the body of this work consists of (1) the development of a modular training program for behavioral observation, (2) a literature based theoretically justified proposal for accomplishing this training with programed video tapes, and (3) the design and development of an electronic video training device necessitated by a future implementation of such a proposal.

A model for behavioral intervention in the natural environment of the child is reviewed and a suitable assessment procedure is outlined. Precise specification of behaviors and environmental conditions through observation is seen as a significant aspect of this assessment work. Potential observers are discussed in terms of time, cost,
accuracy of data collection and other factors. A training program overview is presented which aims at a combined population of university students and teachers or parents of "problem" children. The program is designed to accommodate the needs of advanced observers by additional rather than differential instructional units.

The uses of video tape in training are discussed both as adjuncts to traditional approaches and as an independent instructional medium. The video literature is reviewed and a design for video rhetoric as it pertains to observer training is presented. Programed instructional material is described and major principles are delineated with appropriate theoretical justification. The proposal for a programed video tape observer training package is concluded with a specification of hardware design requirements for a training device which will accomplish the needed functions in automated fashion.

The conceptual overview presented in the main body of the text is further broken down into content outlines for all but one section of the proposed video tape program. This remaining section is presented as a sample script including blocking directions for production in a video studio. Also appended is a description of the electronic video training device designed for use with this program.
Chapter 1

BEHAVIOR MODIFICATION IN THE NATURAL ENVIRONMENT

Behavior Modification refers to the systematic application of S-R learning theory principles to the understanding and treatment of maladaptive behaviors. Behavior Modification or Behavior Therapy (Eysenck, Lindsley, Skinner), may best be conceptualized as an applied method of scientific inquiry which aims at providing the most efficient and effective treatment approach to specific behavioral problems. Two aspects of this definition are of great importance. The first is the specification of problems as behavioral--those that involve observable, recordable and objective data. Hence the domain of Behavior Modification is limited to clinical problems for which specific behavioral objectives can be defined. Intrapsychic conflicts, repressions or dynamic explanations are forgone or replaced by a therapeutic focus on overt responses and the environmental stimuli that control these responses (Ullman & Krasner, 1965). The second aspect concerns the incorporation of the central core of the science of behavior--the principles derived from contemporary learning theory (Eysenck, 1964). It is interesting to note that this
defining aspect may be restated without specific reference to learning theory per se, as:

Behavior therapy is the attempt to utilize systematically that body of empirical and theoretical knowledge which has resulted from the application of the experimental method in psychology and its closely related disciplines (physiology and neuro-physiology) in order to explain the genesis and maintenance of abnormal patterns of behavior; and to apply that knowledge to the treatment or prevention of those abnormalities by means of controlled experimental studies of the single case, both descriptive and remedial. (Yates, 1970).

Thus a reliance is made upon the scientific method in the development of theoretical principles which may be applied to the goal of behavior therapy--the changing of unadaptive behavior (Wolpe, 1969). Whether referred to as learning theory or "relevant empirical and theoretical knowledge", the present state of the art can be conceptualized with two (or possibly three) major theoretical orientations subsumed under the single rubric of the Psychological Model (Ullmann & Krasner, 1965).

The Psychological Model views maladaptive behavior as qualitatively the same as all other behaviors in that both may be learned and unlearned through the process of acquiring a functional connection between environmental stimuli and behavior. The two major forms of learning theorization are Classical or Respondent conditioning and Type II or Operant conditioning. Another theoretical body of literature of specific
utility to the major tenets of the present work is the orientation taken by Modeling theorists with "no trial learning" (Bandura, 1965).

By far the most useful learning theory model for parent-child intervention is the operant conditioning model as formulated by B. F. Skinner (1953). A technique based almost exclusively on operant principles and one which has shown itself to be of extreme value to the behavior therapist working with parent-child problems is the technique called Contingency Management. Contingency Management refers to the rearrangement of environmental consequences which strengthen or weaken specified behaviors. Undesirable behavior may be weakened by withholding reinforcement or by the use of punishment and desirable behavior may be increased or strengthened by following it with a reward. The procedure of applying contingency management involves the reorganization of existing patterns of reinforcement so that they lead to a modification of the "deviant" behavior for the ultimate benefit of the deviant individual and those affected by him (Tharp & Wetzel, 1969). Reinforcers are operationally defined as consequences of behavior which increase or strengthen the probability of an individual repeating the behavior in the future in a similar situation. They may be presented or withdrawn contingent upon specified behaviors.
Reinforcers for the targets of our population are structural aspects of the natural environment of the child. These reinforcers already exist (or may be potentiated) within the life space of the target individual. Hence a new model of corrective intervention may be employed which involves the reorganization of the reinforcement control patterns already exercised by the people within the natural environment of the child. This model makes use of existing sources of reinforcement control (i.e., the mother, father or others) to apply the altered contingencies to the target child for appropriate behavior change.

The term Behavior Modification in the Natural Environment refers to this new form of behavioral intervention. Beginning successes in the area have been reported as early as 1959 by Williams who taught parents of a tantruming child the principles of extinction. Boardman (1962) used a consultation model to work with a young boy who displayed aggressive behaviors, lying and running away. The parents were instructed in the use of a punishment contingency and were direct agents of changes in the boy's behavior. Other studies (e.g., Allen & Harris, 1966; Hawkins, Peterson, Schweid & Bijou, 1966; Latham, 1972; O'Leary, O'Leary & Becker, 1967; White, 1972; Zeilberger, Sampen & Sloane, 1968) further demonstrated the effectiveness of using parents
as mediators of reinforcement for their children.

The Triadic Model

A large-scale Behavior Research Project involving the exclusive use of contingency management techniques in the Natural Environment is described by Tharp and Wetzel (1969). A triadic organizational pattern of training and communication is used with every case described.

A similar approach was begun by Doctor (1973), in an intervention project with parents of the retarded. Although certain differences in overall approach exist, the basics of the triadic organizational patterns and the predominant use of the contingency management technique are maintained. The following descriptions elaborate this modified version of the triadic intervention model as it applies to this population.

Supervising Psychologist

A Ph.D. level psychologist forms the first step in the chain and provides supervision and direction to the Behavior Analyst on the basic strategy of assessment and intervention—the supervising psychologist must train the Behavioral Analyst (BA), who acts as major interventionist in the project, in the complexities of behavioral analysis, data collection, and intervention techniques. In general, the clinical experience of the
Supervisor is passed along to the BA through initial training sessions and progress consultation.

The Behavioral Analyst

The Behavioral Analyst is a behavior modification technician who conducts all contacts with the target child and significant persons in the child's environment. BAs are graduate students working on their Master of Arts degrees in Psychology who receive major training from the Supervising Psychologist. The BAs are responsible for conducting assessments, the development of intervention plans and the carrying through with the intervention program itself under the direct supervision of the Ph.D. psychologist. In many cases it is their job to train teachers or parents in the principles of Contingency Management, and behavioral observation procedures as they apply to the target child.

The Target

Most of the target population consists of young (5-15 years of age) behaviorally handicapped children with diagnoses of "developmentally handicapped", "mentally retarded", and "behaviorally disordered". Referrals were made by the Tri Counties Regional Center for the Retarded in the Ventura County area of California. Typical problems involved child management
problems such as tantrums, enuresis, excessive dependency, non-compliance, or aggressive behavior and behavioral deficits such as inadequate social or work skills.

Structure of Intervention

Initially a referral is made to the Supervising Psychologist to conduct a behavioral assessment. It is the purpose of this assessment to ascertain the feasibility of conducting a behavioral intervention with this case. All interviews with target, parents, teachers, etc. are done by the BA during this phase. Data from observations and verbal reports are gathered and analyzed and an assessment report including a functional analysis of the problem behavior is drawn up. If the assessment work indicates a case for potential or possible behavior change, the client is accepted for intervention. The BA with the psychologist's supervision then conducts the intervention program. In almost every case the model of parent or teacher training applies. The parent is instructed in recording procedures and the principles of contingency management. At first only programs with relatively good chances of success are set up. As the parent progresses through a series of mini-programs the general contingency management strategy is outlined. Success is dependent upon many factors; such
as 1) the ability of the parent to understand basic principles, 2) the parents' motivation to work with the BA in a behavior modification program, 3) the reinforcers available and the potential for consequating them and 4) the appropriateness of the intervention plan. In short, all these factors must be explored in the assessment phase before any intervention is conducted.
Chapter 2

ASSESSMENT

The basic goal of the Assessment procedure is to translate raw data into meaningful relationships utilizing the behavioral model. It is, then, a systematic procedure of information collection which assesses the total social and behavioral field of the target individual. The vast amount of information gathered is then used to prescribe a course of behavior change. Finally, process evaluations are made and follow-up data are collected to complete the assessment procedures. The procedures involved in conducting natural environment assessment have been detailed by several authors (Kanfer & Phillips, 1970; Mischel, 1968; Sulzer & Mayer, 1972; Tharp & Wetzel, 1969). The following classification was derived from these sources as they relate to the modified version of the Triadic model just described.

Identifying Information

General information on the problem behavior, the target child, and relevant circumstances gathered from the referral agent may be collectively described
as Identifying Information. The referral agent is the individual or persons reporting the child’s behavior as problematic and requesting help in dealing with it. This person may be a counselor, social worker, teacher, parent, medical doctor, institutional staff member or the client him-or herself—in short, any person seeing the need for behavioral intervention and making a request for aid to the appropriate agency. When a decision is made to accept a case for assessment, the BA is assigned to the task of gathering information from all relevant sources. Prior psychological evaluation, medical reports and other written information from available files are scrutinized first. Interviews with significant figures in the child’s environment are conducted and a wealth of subjective information is gathered. These verbal descriptions often reflect personal motives, contain inconsistencies, and may be based upon hearsay. Except for the asking of specific questions, the BA remains fairly passive and attempts to establish a positive rapport with potential mediators. When all significant parties are contacted, the groundwork for conducting objective observations is laid.

Design and Implementation of Objective Observation

The designation "objective" refers to a desire to transcend the motives and incomplete or biased
information of the referral agent through planned observation. Thus an attempt is made to objectively explore all aspects of the total situation that could 1) affect the behaviors in question and 2) lead to its amelioration.

1. Pin-pointing Behavior

Before an observational charting schema can be devised, an exact specification of terms must be made. Molar generalization must be broken down into molecular units of behavior so that communication from observer to BA to supervisor (if necessary) is complete. The specification of discrete units of behavior (i.e., a specific movement cycle) increases the probability that a given situation or event would be similarly recorded by two or more observers.

2. Characteristics of Problem Behavior

The quantification of target problems must be made specific to the particular situation. The strength of a response (either excesses or deficits) is described with appropriate parameters; such as latency, intensity, duration, and frequency. The computation of rate from frequency over time is often very useful in subsequent analysis.
3. Antecedent Stimulus Events

Antecedent or discriminative stimuli involve all setting events or conditions which provide some sort of consequence for a particular behavior. Thus the physical setting (e.g., school, institution, home, playground, neighborhood), the social situation (e.g., in the presence of mother, siblings, teacher, other children), any environmental condition (e.g., a command or request made, the ringing of the phone, a particular time of day) may all constitute relevant stimulus events.

4. Consequent Events

The consequences that occur contingent upon the emission of the target behavior are of central importance to the development of a behavioral analysis. Such consequent events are often quite complex and it becomes important to analyze their functional relationship with the target behavior. For example, a consequence such as being sent to one's room may topologically (on the surface) seem to be a punishing event whereas its true function could be that of a negative reinforcer in an escape paradigm--removing the child from an otherwise undesired situation. That is, the child may be rewarded by escaping from work, etc. by behaving in a way that results in being sent to his or her room.
5. Charting

Charting procedures involve both choosing an appropriate form and code or symbol for recording so that the whole process becomes efficient and meaningful. Often charting begins with a naturalistic log and proceeds to 1) a more specific and particularized form which anticipates specific behaviors, antecedents and consequences or 2) a time sampling technique for very frequently occurring behaviors. Codes or symbols are used to designate behaviors, antecedents and consequences which occur frequently enough to warrant their use in saving time or space on the chart.

6. Choice of Observers

The implementation of objective observation involves the decision of who will do the necessary observations. Possible observers are: 1) the BA, 2) a trained outside observer, 3) the target child him-or herself, or 4) the parent, teacher or other person directly affected by the problem behaviors. Special circumstances sometimes dictate one or more of the above as being the most obviously suited although most situations allow considerable latitude of choice. Advantages and disadvantages of each potential observer will be delineated.
Behavior Analyst: The advantages of having the BA do the primary observations are of course obvious. Since the BA is already trained, no transmission of communication losses are involved from design to implementation. Doing his or her own observations also affords the BA a better understanding of the total situation since he gains greater exposure to the existing environmental conditions.

Since the BA is an outsider to this existing environmental situation, a degree of reactivity is involved. Any outside observer may alter the situation he or she is trying to assess. This observer effect may produce greater changes in parental responses than in the child's emission of target behaviors. Some biases residual from the identifying information stage may be harbored by the BA which could further reduce his or her effectiveness in producing objective data. Probably the most serious objection to using the BA as primary observer is the time/cost factor. Target behaviors often occur at relatively inconvenient times for the BA. Bedtime problems, enuresis, or morning tantrums would be almost impossible to match with a BA's schedule. Also of importance is the fact that a good sample of behavior often involves several weeks of daily observation—hardly a practical endeavor for salaried Behavior Analysts.
Outside Observer: In the course of Natural Environment work it is often found convenient to use a trained person whose job it is to conduct observations. This person may be an undergraduate student or a parent who has already been trained in observational procedures by either the Supervising Psychologist or a BA. These observers are paid at a lower rate and therefore become more cost-efficient for long-term observations. Communication from the outside observer to the BA is, of course, somewhat less complete although reliability is usually quite good. The outside observer also carries the least bias from previous knowledge of the case of any possible observer. Observer obtrusiveness still presents a problem, but it probably exists at a lesser degree than with the BA.

The Client: The target child may provide a record of his or her own behavior or the behavior of the parents. Client observers are used only in special circumstances and usually as an adjunct to other adult observations.

The Parent, Teacher, etc.: The use of the person or persons directly affected by the problem behavior of the child as primary observers presents a unique situation. The advantages of having a non-reactive (for all practical purposes) observer amidst the everyday
environmental situation is, of course, obvious in collecting the cleanest data. Biases, however, may sometimes be held by the parent, teacher, etc. and the very act of observing oneself may change the observer's behavior. One factor that may at first glance be counted as a disadvantage is the time that must be spend by the BA in training the parent who presumably starts with no prior knowledge of observational techniques. In actuality this time may be well spent as it provides 1) additional assessment information on the potential of this person as a mediator and 2) the training necessary for mediating an intervention program if it is later initiated. The time spent by a BA in training a parent may be compared to the time that would be otherwise spent by other observers. Thus, it is most often the person who is directly affected by the problem behavior that provides the best data for the least expenditure of time. Additionally, the use of this person as an observer provides necessary mediator assessment input and provides the skills required for future intervention.

In practice it is always wise to allow for several independent sources of observational data to provide input for analysis in an attempt to level biases and allow for reliability checks amongst observers.
7. Potential for Change

The degree of control that may or may not be available in a particular situation is referred to as the potential for change. Incentive, motivation and potential of the mediator and the target child are explored in the total assessment procedures. Questions are asked as to who in the Natural Environment has the time, control and potential for acting as mediator. Does this person want to see behavior changes in the target and what effect would these changes have upon his or her life? The question of ability to understand the principles necessary in conducting an intervention can be addressed by noting the person's performance as an observer. Were charting procedures learned quickly and was work done systematically and completely?

A detailed assessment is made of the reinforcement hierarchy of the target including both those reinforcing consequences that are presently available and those that may be potentiated. Additionally, information concerning the frequency of appropriate behaviors, existing skills and other deficits of the target are explored.

Behavioral Analysis and Initial Intervention Plan

The concluding task of the Assessment procedures is a delineation of the functional relationships
between environmental conditions and target behaviors. This functional analysis of behavior attempts to explain the existing situation in learning theory terms as in the following examples. Tantrum behavior may be seen as being reinforced positively by giving in to persistent requests or negatively by allowing the child to avoid unpleasant activities by tantruming. An enuretic child may not have developed the reflex of a full bladder stimulus leading to the response of awakening. An "acting out" student may be reinforced by peer and/or teacher attention. A lazy, unmotivated boy may not receive contingent reward for approximations of working. Parents may be inconsistent in their reinforcement-punishment procedures so that no discriminative response-contingency function is perceived by the child.

The delineation of functional relationships defines a built-in corrective analysis, to wit: the contingencies are changed for the tantrumer, the full bladder-awakening reflex is developed for the bed-wetting child, the acting out child is no longer given deviant response contingent attention, approximations are reinforced for the lazy boy and parents are taught to be consistent. The corrective analysis must now be matched with the existing potential for change data to see if and how an initial intervention should proceed.
Consideration of the functional analysis, the ideal corrective model and the potential for implementation of this in practice leads to a decision to accept or reject a case for intervention. If a case is accepted, the outlining of an initial intervention plan combining ideal and practical considerations completes the assessment procedures.
Chapter 3

OBSERVATION TRAINING

Behavioral assessment procedures make extensive use of observational data. Such data are often gathered by individuals (e.g., parents, teachers, institutional staff members) who must be trained in observational techniques by Behavioral Analysts. The observation training required by one parent to observe the specific circumstances of her child's problematic behavior may be somewhat different from the training required by another parent. However, a good amount of similarity exists in their respective training programs. Students or others who function as outside observers receive similar initial general information but continue their training so that they can adjust to the variety of situations they may encounter.

Many researchers have made contributions to the area of observational training and several coding systems exist (e.g., Bijou, et al., 1969; Hulten & Kunzelmann, 1969; Kubany & Sloggett, 1973; Kunzelmann, 1970; Patterson & Gullion, 1971). Additionally, several studies have dealt with observer reliability and methods for minimizing the reactive nature of an observer's
presence in the natural environment (Grimm et al., 1972; Patterson & Harris, 1968; Romanczyk et al., 1973). Others have explored the relative efficiency of observation styles (Kissel & Yeager, 1972; Smith, 1958; Yarrow, 1963). The following represents a synthesis of the work done in the field in outline form. The specific aim of this training program is to teach parents, teachers and student observers the basics of providing baseline data for behavioral assessment.

**Behavioral Observation Training Program-Conceptual Overview**

1. Introduction to Behavioral Observation

The initial step in observer training is to present a cogent argument for expending the effort necessary to learn how to do behavioral recording. The student, for whom such training would be seen as a necessary part of his education, will probably require less convincing than a parent who seeks help for an immediate problem. The parent or teacher is made aware of the fact that such work is necessary as an assessment tool which will hopefully lead to the amelioration of the problem. The importance of assessment in a program of behavior improvement should be stressed heavily as a prerequisite to the design of an intervention plan.

An overall outline of the program to follow
should then be given combined with an initial rationale for each section. This training program outline functions as a pre-organizer of the material to follow and will better integrate the overall strategy. At the end of each section a set of questions will be asked to provide a process evaluation of the trainee's progress. Feedback on these questions or discriminations should be given immediately and a criterion for proceeding to the next section is established. If, for instance, an 80% correct criterion is established for continuation, the trainee's responses must be correct 8 times out of 10 in order for him or her to continue. Remedial review is recommended if a trainee fails to meet or exceed the criterion and a retest must be passed at the same criterion level before continuation in the program can be made.

The responses made to the question-discrimination section at the end of each section will provide additional feedback to the programmer for future improvement of the presentations. Each of the following sections will likewise provide a pre-organization outline of the material to be presented in it and a rationale for completing each subsection as it relates to the whole program.
2. Defining Behavior-Pinpointing

Precise behavioral definitions are described in this section by the use of examples. General descriptions frequently heard in interviews are translated into specific behaviors with an appropriate rationale. For instance, the behavior of a child described as "aggressive" would be pinpointed as "rock throwing", "pushing", "hitting", etc. Messiness would be translated as "leaves socks on bedroom floor", "food is left all around eating area", "toothpaste cap is left off", etc. The overall strategy for this instructional unit is to develop a trainee's skills in reducing molar generalizations into specific behaviors and discrete behavioral classes that may be quantified.

Movement cycles (Lindsley, 1964) are described as behaviors that are; 1) controlled by the child, 2) have movement and 3) are repeatable. A suitable set of examples is given to emphasize this point and process evaluation is made calling for discriminations among similar examples.

3. Quantification of Behavior

This unit describes how to measure the behaviors pinpointed in the previous section. A rationale is presented as to when to use the quantification measures of latency, intensity, duration, frequency and rate to
provide a measure of the strength of a response. Process evaluation of conceptual understanding can be made by requiring trainees to choose the correct measures for a particular target behavior. For example, tantrum behavior would usually involve rate (or frequency over time), intensity and duration, non-compliance could be best quantified with latency and frequency, etc.

4. Stimulus Events

The trainee begins this unit with a basic understanding of pin-pointing, movement cycles and quantification of response parameters. Stimulus events are described by the subclasses of antecedent and consequent events. Setting events may also be included as a separate condition that affects the strength of specific stimulus-response relationships (Bijou & Baer, 1961) or as a subset of antecedent events. The similarity of defining and recording stimulus events and response events should be pointed out and frequent examples given. Before process evaluation of learning in this unit is given, a preview of charting and coding conventions is briefly presented.

5. Recording Methods

The goal of the Recording Methods unit is to build sufficient understanding of recording techniques
so that trainees can design and use their own logs and codes to meet a variety of situations. Progression is made from naturalistic logs through the A B C format to examples of individualized logs for specific situations. Trainees should practice with each form while viewing video tapes of behavioral displays. The advantage of coding shorthand will become obvious and many fine examples of coding conventions (i.e., Bijou, Peterson, Harris, Allen & Johnson, 1969; Kubany & Sloggett, 1973; Patterson, Ray, Shaw & Cobb, 1969) can be described. Continuous Recording and time sampling styles are introduced and watches, timers, clipboards and data sheets are demonstrated. Evaluation of progress in this section can be made by giving examples of specific situations and having trainees design their own logs, codes, and recording styles to fit each case.

6. Recording Practice

Now that some exposure to actual recording has been given, trainees are ready to progress to more applied situations. Initially, video tapes of behavioral displays can provide needed practice with a minimum of time expenditure. Adequate preparation for actual field observations should be given, including methods of minimizing the observer effect by being as inconspicuous as possible, breaking eye contact and
avoiding interaction with the target. For students and outside observers, the proper etiquette for approaching a new field situation should also be included, highlighting unobtrusive identification-of-target techniques and system structural procedures (release forms, etc.) for school and home observation. Actual field experience is now called for and may begin with controlled situations where several trainees may concurrently observe through a one-way screen. Simultaneous video taping could provide evaluative and corrective functions for review at a later time. Continuing trainees may gain experience in calculating observer reliability coefficients from such sessions.

7. Charting Procedures

Advanced observer-trainees will receive instruction in converting raw data into charts and graphs preliminary to making a behavioral analysis. The plotting of movements per minute data on six-cycle semi-logarithmic chart paper is one area covered. Various types of charting conventions are discussed and examples of baselining, intervention and reversal chart designs are demonstrated. Additionally the concepts acceleration, deceleration and maintenance are introduced in this section using the previously learned quantification measures and frequent examples for clarity.
Adjunctive Video Tape Displays

Mention was made in the previous section of the use of video tapes to display scenes of behavior for use in observation training. Several advantages of this ancillary use of the video media are apparent: 1) trainees spend less "dead" time, 2) appropriate scenes can be displayed as they fit the program and 3) review can be made with an "instant replay" of the observed behavior.

The first point concerns the extra amount of time a trainee would otherwise spend in observation practice in live situations. Even if an ideal observation site (e.g., a pre-school on campus) were located close to the training room, some time would be spent in transit to and from this location. Additional time would also be spent in filling out forms, waiting for behaviors to occur and the scheduling of observation periods. This experience could be of use to more experienced students, but not for those in the initial units of training.

The replay potential of the media is perhaps the
most advantageous of all. It has been observed that "the reliability of video observations is as high as for live observations of the same behavior" (Eisler & Hersen, 1973). Since all the cues necessary for behavioral observation may be presented in video form (Gartner, 1972), the replay potential can be utilized: 1) to pick up missing data, 2) in reviewing important points or 3) for gathering data on more than one target in the same environmental setting.

A Proposal for Total Video Instruction

The use of video-taped displays as an adjunct to traditional lecture format instruction for observer-training has been explored in the previous section. The proposed modular presentation of the program in separate units lends itself nicely to the possibility of a total video instruction package. Several advantages of this presentation style result for the proposed population of observer-trainees.

Parents may come in to centrally located centers and request only those instructional units that apply to their situations. Modern video cassette playback equipment requires minimal instruction in its use and its operation may be demonstrated on the first introductory unit tape. An assistant at the center would show the parent to the viewing room and start the
cassette for the first viewing only. If the criteria for the first or any subsequent tape were not met, a simple two button rewind-rerun operation would repeat the entire tape or any section which was unclear to the parent. If for any reason a parent could not come in to the viewing center for training, a technician would bring a portable player to the home and connect it to the parents' set. Process evaluation could be done with responses recorded on an accompanying work sheet.

Student trainees would check out tapes from the tape library for immediate use in nearby viewing rooms. They could schedule their training to suit their own schedule and turn in the process evaluation work sheets to the tape librarian.

Several questions arise from the proposal for total video observer-training: 1) has video instruction been demonstrated to be as effective as live instruction and how can the best features of the medium be incorporated into this program and 2) how can immediate feedback of results be given when process evaluation is used as criteria for the completion of instructional units?

I.T.V. Research Findings

The first question to be addressed in proposing a video observer-training package is, can Instructional Television (I.T.V.) be as effective as the Face-to-Face
lecture method? Most I.T.V. experts who have summarized
the voluminous literature of relative effectiveness
studies agree that the overwhelming finding has been no
significant difference between the two presentation forms
(Burke, 1971; Chu and Schramm, 1967; Gordon, 1965;
Greenhill, 1964; Koenig, 1969; Kumata, 1965; Rich, Poll,
& Williams, 1965). It must be pointed out, however, that
many of the studies reviewed by these researchers were
found to be methodologically inadequate owing to poor
experimental design. Nonetheless their general recom-
mendation for future research may be summarized by
Schramm (1960) in his synopsis of the Symposium on the
State of Research in Instructional Television and
Tutorial Machines, held at Stanford in 1959. A mora-
torium on repetitious research is called for since

more than enough studies have now been
built around such questions as, can television
teach? or, can television teach as well as the
classroom lecture? There is no longer any
reasonable doubt that television can teach as
many facts and skills as the same lecture given
in the classroom. and Although some impatience
was expressed...with research aimed at discovering
whether the new media could "teach", there was
general recognition that much remains to be learned
about how and under what conditions they can best
teach.

Dissatisfaction with much of the I.T.V. research
to date results from asking the wrong questions (Burke,
1971; Gordon, 1965) since video presentation is not a
teaching method in-and-of-itself but instead, only a
means of communication (Wood, 1974). The proper
question seems to be what method of instruction would best lend itself to presentation through the medium of television to produce the most desirable learning outcomes? Before any answers to such a general question can be arrived at, a clear delineation of unique video media characteristics and precise specification of desired learner outcomes must be made.

Characteristics of Television as an Instructional Medium-A Design for I.T.V. Visual Rhetoric

Video programs produced by recording a lecture simultaneously being given to a class would be a very ineffective use of the media's potential. Such a use "may be looked upon as an appendage to a system never designed for use of technology" (Calvert, 19--). Much like the invention of the elevator which permitted a totally new concept in building construction, the potential of video instruction will not be fully realized until its unique characteristics are explored and utilized in programming designed specifically for the medium (Rhodes, 1974). As pointed out by many I.T.V. experts (e.g. Carpenter & Greenhill, 1962; Maloney, 1967; Mc Bride, 1966; Merrill, 1964; Mielke, 1971) such use of unique video characteristics should be restricted to situations which take full advantage of media effects. The media characteristics listed below are discussed in
relationship to behavioral-observation training and the research on television aesthetics.

1. Visualization Techniques

Live lecture or observation settings may tradject visual angles of 180° or more requiring frequent head turns and eye movements. Television, on the other hand, displays a two-dimensional pictorial-graphic image on a small screen requiring little eye or head movement. This attentional disadvantage must be overcome by; 1) frequent display changes to stimulate the viewer's eyes and avoid boredom and 2) the predominant use of medium and close-up shots for highlighting instructor communication.

Eye movement studies (Guba, Wolf, deGroot, Knemeyer, Van Atta & Light, 1964) indicate that a loss of visual attention results after viewing a long scene but may be recaptured with the introduction of a new scene. Shot changes through visual transition (cuts, fades, wipes, etc.) increase the dynamic quality of the presentation and results in improved learning (Aylward, 1960). Used strictly as attention-getting devices, however, such special effects have no positive influence on learning (Kanner, 1962). Such findings would indicate short to medium scene length and the use of special effects only when necessary to present additional information. The split-screen effect might be usefully
employed to simultaneously display the target child and the recording responses of an observer writing in the child's behavior on a log sheet. Specific terms may be introduced into the visual display through the use of superimposition of the printed word(s) at the appropriate time.

Although research results do not support increased learning with specific shot choices (close-ups, etc.), a convention to emphasize or highlight content with a tight shot exists and may aid the viewer in the identification of important information (Anderson, 1972). The use of close-ups provides a new set of communication cues to the viewer since gestures and facial expressions can be more easily noted. Implications of visual field research (e.g. Guba et al., 1964) caution, however, the irrelevant presence of an instructor's face if other portions of the display are of importance. Viewers tend to become preoccupied with a narrator's face to the exclusion of other objects—even strong distractors. A research review done by Hoban (1962) suggests that more information is often transmitted than is received by the audience and that the use of "pop-in arrows" or other identifiers produce an increment in learning by highlighting relevant cues.

The intuitive expectation of increased learning effects resulting from the addition of the color
dimension to visual presentation has not been supported by the research (Chu and Schramm, 1967; Hoban, 1960; Kanner, 1968). Some differences were noted when color was a relevant cue (art production films), but even in such cases the advantage was minimal. Color would seem to increase attention but no support for this thesis has been found thus far. In terms of observation training the added complication of color production does not seem to be justified.

2. Instructor Requirements

An essential element in the production of Instructional Television programs is the preparer and presenter of the television lesson. Face-to-face teaching almost necessitates the same person for both content preparation and delivery of the lecture. The video format usually requires both content and delivery specialists--most often a team effort. Above all, the video instructor must be a communication expert, knowledgeable in the techniques of vivid, forceful and effective presentation style (Mc Bride, 1966). Unfortunately, television has a tendency to magnify mediocrity and careful attention should be given to selection and training of video communicators. It is interesting to note that the production staff need not have expertise in the field they are presenting for video programs.
Blenheim, (1968) demonstrated that in a majority of instances, experienced T.V. communicators can produce factual learning in students as well as experienced experts in the field.

Video playback affords each student a front row seat and direct eye contact with the instructor. This focusing feature probably accounts for the previously cited attentional exclusion of additional information in the visual display when the instructor's face is included.

An advantage of the media that may be included under instructor variables is the potential for totally dominating the visual field with graphics, slides, films or video tapes while presenting comment or elaboration on the audio channel. Display scenes done originally on video tape (or subsequently transferred) may be redisplayed, slowed or stopped (freeze frame) to emphasize critical target movement with accompanying instructor commentary. Unlike the conventional lecture format, a video instructor may redo any section of the tape to his or her satisfaction before releasing it to students. A wise predistribution check could be made by inviting colleagues and students to critique or pretest the pilot tapes.

3. Presentation Differences

Several dramatic differences exist between
face-to-face instruction and I.T.V. presentation forms. Live small-group instruction involves frequent eye contact with the instructor and the possibility of student or teacher posed questions. Such a situation requires student attention or behaviors indicative of such a state. The instructor continues to a new content area if she or he feels that the material is covered or if students 1) do not ask questions, 2) facially indicate understanding or 3) respond to a teacher-posed feedback question. This third continuation-determinant is often acknowledged with no student response at all, as with the question "Is that clear?" or "Can we move on now?" Student silence to such a question would indicate that the previous topic was explained well enough to allow for continuation. With closely matched groups along the dimensions of academic ability, previous knowledge of the subject matter, interest and state of attention, such indices may be quite accurate. Unfortunately, students often vary greatly in these areas and behaviors indicating attention and understanding (note taking, eye contact, and attentive facial expressions) are easily learned by even the slowest in the group. Again, however, faster students (or those starting with previous knowledge of the subject) are slowed down to allow others to catch up.

This disadvantage of live, small group
instruction applies doubly to the large lecture format. In such a situation the lecturer must anticipate the mean level of learning potential for the particular group and pre-structure his presentation to fit this ideal. The model would dictate a level sufficiently high to retain the attention of faster students but not significantly above the bewilderment point of slower students. Since lectures are given only once, supplementary sources (class notes, texts or other written materials) are consulted to bridge any gap existing between actual and ideal learning. This, of course, presupposes that slower students will, in fact, recognize their deficits and make attempts to rectify them. The use of supplementary sources brings up another point; for many students, most learning may not occur during lecture periods at all, but instead while reviewing notes taken from them. This allows the student to passively take in the lecture with occasional note taking for future study.

The picture thus far presented, plays up the negative and fails to elaborate the heuristic model with lectures functioning predominantly as motivating agents for later, more individual and complete student inquiry. It is neither stated nor implied that such a system is without use in higher education. The comments expressed are confined to the area of behavioral
observation training and as such, will concern only this area of instruction.

As with the large group lecture method, video instruction may be at best programmed to meet the needs of an average, one time viewing audience. If material is aimed at the faster students, however, tapes may be easily repeated for students requiring additional review. One drawback that seems to be at its worst with television instruction is the passive nature of the medium. No assurance of attending to the material is made with either group or individual video presentation. Including a proctor or reference instructor in the I.T.V. viewing room will, at best, result in eliciting attending behaviors with no greater assurance of student understanding than that with the small or large group lecture formats (depending upon the viewing group size). Proctoring would also cancel the instructor time saving advantage usually cited for video instruction. This disadvantageously passive component of video instruction may be compensated for, to some degree, by interesting content materials and well-planned programming.
Chapter 5

PROGRAMED INSTRUCTION

Programed instructional material has been reviewed and defined by behavioral scientists in a number of ways. Lysaught and Williams (1963, p.2) define a learning program as "the process of arranging materials to be learned in a series of small steps designed to lead a student through self-instruction from what he knows to the unknown of new and more complex knowledge and principles." Glaser (1961, p.9) describes programming as "the process of constructing sequences of instructional material in a way that maximizes the rate of acquisition and retention, and enhances the motivation of the student." The Epsteins (1961, p.1) refer to a program as "lessons prepared in a special way, so that the student can scarcely fail to learn." Other experts describe the characteristics of programed materials with a series of specifications reflecting their appearance, their methodology of preparation, their theoretical or historical antecedents, or their emphasis on high levels of achievement (Klaus, 1965). Despite the range of defining characteristics to be found in the programed

**Basic Principles**

In order to provide research and theoretical justification for the principles of instructional programming, a taxonomy of defining characteristics will be used. The nomenclature follows from principles emphasized within S-R theory, cognitive theory and personality theory as they apply to the learning situation.

1. **Learning Rate: Accounting for Individual Differences**

Several factors affect the rate at which a particular organism can learn a given amount and type of material. Individual variables such as anxiety level, perception of group atmosphere, ability level, motivation and prior knowledge are included with presentation variables to assess the total learning picture. Programming principles dictate an individual approach to learning. The student works at the programed learning materials at his or her own pace, going on to another unit only when he or she has mastered it. Since students work individually, pressure resulting from a perceived
need to match group expectations is reduced. Anxiety, as a consequence of failing to meet such norms in a specified time, may therefore reduce as well (Ellis, 1962). Students who normally perform in the lower half of traditional group instruction situations may increase their motivation level and their interest in the subject matter owing to new found learning successes resulting from the more appropriate pace of instruction. The self-paced characteristic allows students of higher abilities and those who start with greater knowledge of the subject area, to progress more quickly through a program. Motivation to learn and interest should improve for faster students as well, since their progress is no longer slowed to a group mean pace.

2. Program Organization

Programed material presents information in a gradual progression of complexity and application. Several types of learning tasks may involve somewhat different forms of this gradual progression (Holland, 1965): (a) factual verbal content programing may consist of hierarchies of interrelated elements; (b) difficult response forms or topographies may be shaped; (c) a program may train students to make subtle discriminations among stimuli; or (d) unrelated associations may be taught by the process of fading. The sequential
presentation strategy aims at producing a learning situation which results in a maximum of success on process evaluation trials. The sequence starts with instructional elements that are already understood by the student. Small learning elements are progressively and cummulative built on to this previous repertoire to accomplish an approximation of the specified terminal skills in stepwise fashion.

The frequency of element presentation is important in providing sufficient repetitive practice or association so that overlearning takes place. Such overlearning of elements insures retention and increases the probability of success on later units. Generalization and discrimination of instructional concepts are likewise aided with frequent practice in varied contexts.

3. Stimulus and Response Requirements

Programming requires a student to demonstrate mastery of a unit of instruction before being allowed to proceed to the next of a sequence which assumes such mastery. In order to insure understanding and provide for active learning, students must respond to questions throughout the program. According to several theorists (Lumsdaine, 1962; Nickson, 1971; Skinner, 1960, 1961, 1963) interspersed process evaluation accomplishes more than a testing function since (1) active student
participation in the instructional process is guaranteed by a program which necessitates learner responding and (2) input for content revision is simultaneously provided for the programmer. Student responses may be made in sensing, identifying or interpreting the stimulus material presented in a variety of ways.

4. Reinforcement

The concept of reinforcement is central to the operant theory basis of programmed instruction and several theoretical generalizations apply aptly (Lysaught, 1963): (1) An individual is said to "learn" if some changes of behavior occur as a result of observing the consequences of his actions.

(2) Reinforcers are consequences that strengthen the likelihood of future repetition of the reinforced behavior.

(3) Reinforcement is most effective if applied immediately following the behavior.

(4) The more often reinforcement follows a particular behavior, the more likely this behavior will be repeated.

(5) Absence or delay of reinforcement following an action reduces the probability of this being repeated.

(6) Task persistence will be facilitated by intermittent reinforcement.
(7) The learning behavior of a student may be shaped toward terminal goals by differential reinforcement of correct approximations.

(8) Reinforcement has a motivational effect by increasing a student's activity, accelerating his or her pace and heightening interest in the learning situation.

(9) Complex patterns of behavior may be shaped from simple elements of these patterns by chaining.

The conditioned reinforcer, "knowledge of being right", is the basis of the programmed instruction strategy. When a student responds to an evaluative stimulus, feedback as to the correctness of this active learning effort must be immediately available. If a correct discrimination is made and this information is conveyed to the learner, an instance of positive reinforcement is said to take place. Incorrect responses are extinguished by withholding this reinforcement and extinction is used to guide learning in the desired direction. As with the stimulus material itself (both instructional and evaluative) repetition of reinforcement for the same behavior increases the learning effect. The behavioral observation training situation involves complex terminal patterns of behavior which must be shaped from more simple elements. The sequential chaining of relevant stimulus material to elicit a maximum of reinforcable learner responses
involves the dynamics of program construction.

**Program Construction**

The same dynamic, logically sequential progression of elements is involved in program construction as in the ideal program itself (Lumsdaine, 1960; Lysaught, 1963).

1. **Outcome Goals**

The programmer starts with a particular set of goals for a specified learner population. Precise operationalization is made of desired terminal learning aims and ways in which these aims may be evaluated. The proposed population of parents and university students represents a considerable range of abilities and entering behavioral repertoires. Separate goals for each group should, therefore, be specified. Such a situation involves a procedural decision to: (1) reduce the terminal learning goals of the faster group so that the same program can be used, (2) construct two separate programs, or (3) devise a single program which allows the parent group to terminate their training at a point which meets their needs and permits students and outside observers to continue the program to their group specific objectives.

Evaluation of learning would consist of discrimination trials of verbal conceptual material, trials assessing verbal generalization of these concepts, and
recognition trials of observational displays as a more applied generalization evaluation.

2. Analysis and Decomposition

After precise terminal goals are specified for each group, the desired behavioral outcomes are analyzed and broken down into the elementary components which are deemed necessary to achieve them. A goal such as the ability to use an ABC log to record behavior would imply conceptual understanding as well as identification and category construction skills related to antecedent, behavior and consequent events. Subunits would be further reduced to basic elements of instructional and evaluative needs.

3. Analysis of Element Interdependencies

The task of this step in program construction is the identification of the logical and sequential interdependencies between the basic elements of instruction. Pinpointing would logically precede the description of antecedents, behaviors or consequences since the latter categories require knowledge of precise behavioral specification in order to conceptualize them. Reorganization is made with such logical progression of both content and evaluative material.
4. Element Interface

With the overall sequence of elements set up as a basic structure the correction process may begin. The goal is to provide continuous reinforcement for correct responses by bridging each sequence of elements with appropriate prompting and coaching of the material to follow. Prompts are faded in successive sequences at a rate which is expected to result in a maximum of correct identifications.

5. Tentative Program
   Formation

The complete sequence of elements is now drawn up, including appropriate interface prompts and evaluative measures. Correction and reorganization is made where appropriate in maintaining the logical continuity of the tentative presentation format.

6. Assessment and Change

The tentative program is now tried out on students typical of the target population. Feedback on effectiveness is gathered from measures of completion time, percentage of correct responses, and verbal report of the students' reactions. The pilot student provides an important input to program change on both evaluative and content grounds. Campbell and Chapman (1965) have demonstrated that students can provide excellent
next section. Automated devices require disks, rolls, tapes or other presentation and response materials specific to each teaching machine design. The various types and uses of teaching machine hardware are discussed in the next section.

Teaching Machines

Mechanical devices conceived of as aids to instruction were reported to be in existence as early as 1866 (Mellan, 1936). In the 1920's Dr. Sidney L. Pressey devised a system of providing students with immediate feedback to questions asked from a mechanical testing device (Pressey, 1926). The first type of automated teaching which gave prominence to the program and conceived of the machine-program association as a system of instruction were the hardware-software combinations of B. F. Skinner (1958). Since the late 1950's thousands of teaching and training devices have been introduced utilizing sophisticated hardware of all descriptions.

Programs designed specifically for use with teaching machines underwent changes as well. Linear programs were introduced that would automatically skip remedial review sections if a correct response was made. Branching programs (Crowder, 1959) were devised which made a student response-contingent determination of the next problem or instructional area to be displayed by the
device. Recent technological advances have even permitted the development of completely integrated instructional systems utilizing computers to "converse with" and guide students in unique individually determined learning paths (Gentile, 1967).

The production of sophisticated hardware is without question far ahead of the design and production of programs necessary for their use (Lumsdaine and Glaser, 1960). This fact has prompted many behavioral scientists (e.g., Gentile, 1967; Melton, 1960; Skinner, 1963) to warn that neither the technical (hardware) nor the semantic (programming) areas should be allowed to develop at a greater rate than the science upon which they are based. This point is, of course, debatable since the discovery of many scientific principles has followed the invention of hardware designed to answer relevant theoretical questions. One would be forced to agree, however, that the design of elaborate instrumentation which accomplishes nothing more than a duplication of human teaching functions would be wasteful at best.

The design of hardware-software training systems requires the consideration of three interrelated factors: (1) the type of knowledge to be imparted, (2) the learning theory based program and functions required to teach this instructional area and (3) the practical considerations of convenience, cost and the state of the
The proceeding sections have discussed the principles of programmed instruction as it applies to the training of behavioral observers. The hypothesis has also been expressed that video instruction may prove to be a very effective presentation medium for this area of instruction. The basics of programming, however, do not lend themselves to video display without some means of instrumentation which would require active student responding and would provide feedback for these responses. The following functions are needed to interface video instruction and programming principles:

1. User Considerations

The hardware used by students and instructors should be straightforward and easy to use. The video viewing room should be pleasant, quiet, and contain a minimum of gadgetry, with comfortable seating at an appropriate (or variable) distance from a high resolution monitor. Instructors should be provided with a non-technical means of amending program content should this become necessary after pilot running of students. All set up and termination procedures should be easily
accomplished. Presently the only form of playback equipment fitting this requirement is a video cassette system such as the Sony V01800.

2. Programming Requirements

Fully programed video instructional material must provide (1) sequential ordering of material, (2) a means of requiring active user responding and (3) immediate feedback as to the correctness of each response. Instructional and evaluative materials may be presented in any combination or sequence and only the normal studio recording equipment should be required to accomplish this. Since the production staff may be independent of the instructor-user (as when professors avail themselves of school Audio Visual services) no special requirements should be asked of the studio crew in producing the tapes.

Active student responding would necessitate some sort of student response unit which could allow at least five choices to be entered. Behavioral observation training may require discriminations within categories such as antecedents, behaviors and consequences hence a set of nine or twelve response keys would be even more appropriate. A provision must be made to prevent multiple answers or responses at an inappropriate time. This interval should be variable to accommodate the anticipated range of user ability levels. In order to allow
the same tape to be used with different response intervals, a supplementary cuing system must be employed to notify users when to respond. A light cue on the subject's response unit would accommodate this function well. Behavioral displays would sometimes call for unprompted subject responding—in such a situation the cue light would be inactivated. Stimulus control of such observed behavior may be built by cuing initial scenes and eliminating the cue function in later discrimination trials. Response intervals must automatically terminate before an answer is given on the video or audio channels of the tape if this means of feedback is employed.

An even better feedback provision would immediately determine the correctness of a subject's response and convey this information with a reward light located either on the video monitor or the subject's response unit. If such feedback could be returned within a fraction of a second, the most logical location would be on the subject's unit since responding would already require an eye shift from the monitor.

3. Research and Content Evaluation Functions

In order to provide an evaluation of program effectiveness and question difficulty, some assessment of student responding must be made. An automated data
collection system should be devised which would provide question number, correct answer and subject response information. Data collection would be facilitated if this information were printed on a permanent record which would include an identification of the subject and the tape unit viewed. Another measure of program effectiveness and question difficulty level is latency. The time it takes a subject to respond after being cued or presented with a scorable discrimination can provide additional self-corrective feedback to the program designer. Such a hardware feature would be extremely desirable especially if such information could be similarly recorded for each question.
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Explanation of Appendices

The conceptual overview of the behavioral observation training program described in the main body of this work is further broken down into content outlines for all but one section. The content outline is used prior to actually scripting a unit of instruction. It elaborates upon elements of content and sequences them in a logical presentation order. Once the content format is finalized, actual video taping of relevant displays may begin. Unlike staged television, natural environment scenes are difficult to specify before the actual taping is done. For this reason, final scripting must be done after all relevant displays are available for review.

Tape #3, Quantification of Behavior, is presented in a scripted form as a way of demonstrating the form and nature of scripting as it differs from the content outlines. The script is an illustrative example rather than a final product and is complete up to the review section.

Appendix Eight describes the electronic video training device designed for use with this observational training program. Completion is expected in August, 1974.
APPENDIX #1

Introduction to Behavioral Observation (Content Outline)
Introduction to Behavioral Observation-- Tape #1

I. Pre-organizational material
   A. Rationale for learning how to do behavioral observation
   B. Description of training program
   C. Instructions for use of the Response Unit
   D. Overview of subsequent tapes
   E. Review/evaluation questions

II. Rationale for behavioral observation
   A. Behavioral model
      1. A brief description of natural environment behavioral intervention is presented (see text).
      2. The suitability of this model in modifying specific behavior problems is discussed. Examples of situations which may profit from behavioral intervention are given.
   B. Behavioral assessment
      1. Assessment is discussed as a necessary preliminary to intervention design.
      2. Determining the strength of a response is described as an important aspect of the assessment procedures.
C. Parents' rationale (Basic)
   1. The observational program will help you to precisely describe the problematic behavior of your child—thus aiding communication of problem behavior with others and making behavioral analysis an easier task.
   2. The understanding of observation techniques will prepare you for additional training in order to carry out an intervention program with your child.

D. Teachers' rationale (Basic)
   1. Observation training will provide you with the ability to efficiently communicate problematic classroom situations to others so they may understand more clearly.
   2. Skills learned in this observation program will prepare you for further training in order to appropriately change the behavior of your pupils.

E. University students' outside observers' rationale (Advanced)
   1. Students, parents, teachers or anyone who desires to work as a behavioral observer in a variety of situations may complete the advanced training.
   2. Learning how to observe and chart behavior
will aid you to:

a. communicate precisely with a behavioral scientist or others.
b. prepare for intervention training.
c. develop advanced skills in preparation for learning how to analyze behavior.
d. gain experience in preparing for a career in the helping profession.

III. Description of training program

A. Program population aim

1. Parents and teachers will view five, twenty minute instructional units which contain review and practice material. In addition, one of the three practice tapes (6a, 6b, 6c) will be assigned according to the type of situations that will most likely be encountered.

2. University students and others who wish to gain advanced observational skills will view all three of the practice tapes plus one advanced instructional unit.

B. Sequencing

1. Each video tape unit must be viewed in order since later instruction is based upon the complete understanding of earlier units.

2. Students must schedule their time so that all units are completed within a specified
period as dictated by viewing facilities, research considerations or class scheduling.

C. Process evaluation

1. Evaluation of learning performance will take the form of interspersed questions which are answered with the Response Unit.

2. Additional questions are asked in a summary section at the end of each unit.

3. Eight out of every ten questions must be answered correctly in order to continue to the next unit (80% continuation-criterion).

4. Missed units (under 80% correct) will require a review of the tape before continuation is possible.

5. No penalty is involved if a unit is missed and repeated as long as the 80% continuation-criterion is met before the following unit is attempted.

IV. Instructions for use of the Response Unit

A. When to respond

1. The use of the Response Unit is demonstrated by video display and active student responding.

2. Question discriminations provide verbal and light cues to indicate when a response is called for. The cue light is amber and is
labeled "RESPOND". It will activate and remain lighted until a response is made or the time interval elapses.

3. Display discriminations may be cued with the cue light or they may be unprompted. Students will be advised by the host when a non-cued observational display is presented.

B. Feedback

1. Immediately upon making a correct response, a green light, labeled "CORRECT" will be activated.

2. The feedback light will remain lighted for two seconds and will operate for cued or non-cued discriminations alike.

C. Continuation-criterion assessment

1. All responses made on the Response Unit are automatically recorded on a data tape so that a determination can be made at the completion of each tape to review or continue to the next unit.

2. Students may determine their performance from the data tape after completing an instructional unit.

V. Overview of tapes

A. Tape #1--Introduction to Behavioral Observation, has attempted to describe the overall training
program and provide a rationale for doing the work necessary for learning how to observe. The use of the Response Unit was described and we are now ready for an overview of subsequent tapes.

B. Tape #2--Defining and Pinpointing Behavior, will demonstrate the use of a movement cycle in developing your skills in reducing observed behavior into terms and categories that may be quantified.

C. Tape #3--Quantification of Behavior, describes how to measure the strength of a response with the categories frequency, rate, duration, latency and intensity.

D. Tape #4--Stimulus Events, defines relevant behavior connected events encountered in the natural environment and describes how to score them.

E. Tape #5--Recording Methods, demonstrates a variety of logs and coding procedures to allow for efficient observation. Recording styles are introduced and an application strategy is provided. With the successful completion of this tape, students should be able to properly observe and record in a variety of situations. Parents and teachers who wish to be able to produce baseline data for analysis of the problem behavior they encounter with their children or
pupils will end their instructional training at this point. A determination will be made for each trainee as to which of the three practice tapes will be viewed.

F. Tapes #6a, 6b and 6c--Recording Practice, will prepare observers for the situations they may encounter. This is essentially a practice unit and will require students to design their own log forms, coding strategies and measurement forms. Advanced trainees will view all three of the practice tapes.

G. Tape #7--Charting Procedures, concludes advanced training by demonstrating how to convert raw data into charts and graphs preliminary to conducting a behavioral analysis.

VI. Review questions

A. The aim of this unit is primarily to stimulate interest, to describe the program and to demonstrate the use of the Response Unit.

B. Questions should be heavily prompted so that trainees will become familiar with the response mechanism and the method of question-discrimination presentation. Examples are given and the answers are prompted as in ... "The correct answer is #3. Press button #3 on your Response Unit. As you can see, the green light came on
immediately after you gave your answer. To
demonstrate an incorrect response, press any
button except #3. This time the "CORRECT" light
did not go on--thus indicating an incorrect
answer."
APPENDIX #2

Defining and Pinpointing Behavior
(Content Outline)
I. Pre-organizational material
   A. Rationale for precise specification of behavior (pinpointing)
   B. Description and training in the use of movement cycles to identify and count target behaviors.
   C. Practice in observing target behaviors
   D. Review/evaluation questions

II. Why pinpointing is necessary
   A. Basic definitions
      1. Target behaviors are described as behaviors which are considered problematic (annoying, troublesome, irritating, sickening, or otherwise aversive) to the parent, teacher or significant other in the child's life.
      Changes in these behaviors (increases or decreases) must be specifiable. The desired change should be of benefit to and desired by the parent and often times the child as well.
      2. Target child--the child who emits the target behavior or behaviors; i.e., the subject of the observation.
      3. Pinpointing refers to a precise specification
of behavior, such that each behavioral movement may be identified as a discrete unit. If a target behavior is properly pinpointed, all observers viewing the same child should agree upon the number and types of target behaviors observed (reliability).

B. Rationale for pinpointing

1. The goal of intervention is behavior change. In order to discover the best intervention technique, we must first know how often the target response occurs at the beginning. Constant monitoring of the behavior will indicate when it starts to change and how rapid the change is made. The intervention plan is modified in light of feedback from observation.

2. Precise specification of desired and undesired behaviors will let the target child know exactly what is expected of him or her once intervention has begun.

3. Parents, teachers or other mediators will be rewarded by noting objective changes in their records when target behaviors begin to change in the desired direction. This will provide added incentive to continue with the program.

III. Movement cycles
A. A rationale is given for the use of movement cycles and how it helps to specify and record behavior.

B. Definition of movement cycle

1. Behavior must have movement, action or effect in the environment.
   a. Examples given: hitting, screaming, talking, running, etc.; i.e., any behavior which can be directly observed.
   b. Examples not qualifying are given: thinking, feeling, hurting, hating, etc.; i.e., any inferred state not involving specific movement.

2. Behavior of interest to us must be controllable by the target child.
   a. Examples given: opening a door, eating a cookie, playing with toys, etc.
   b. Examples not qualifying are given: a child's response to being burned, bodily needs, etc. Needs such as eating, drinking, etc., should be qualified since some control is involved.

3. Behavior must be repeatable; i.e., an observer must be able to identify the beginning and end of a movement cycle.
   a. Examples given: writing a letter, word
or sentence, getting out of one's seat and returning to it, saying a word, obeys a command, etc.

b. Examples not qualifying are given: feeling happy, thinking about play time, etc. The beginnings and ends of these examples are not easily identified by observers.

C. Establishing the size of a movement cycle

1. The size of the cycle should reflect the relevant aspects of the behavior; i.e., those of particular interest to an observer.

2. The size of the movement cycle is defined by the observer. For example, the parent or teacher would define a unit size that relates to the aversive aspects.

IV. Practice in observing target behaviors

A. School behaviors

1. A single category discrimination is called for in each display example. Students respond only at the conclusion of one complete movement cycle.

2. Possible movement cycle displays:

   a. Pupil working on math problems—movement cycle ends when the child writes in an answer and goes on to another problem.
b. Pupil gets out of seat often--movement cycle ends when child seats him-or herself again.

c. Pupil drops a book from the desk--movement cycle ends when book is placed back on the desk.

d. Pupil turns his head and sticks out his tongue at a classmate--movement cycle ends when the child turns back to the start position with his tongue inside his mouth.

e. Other possibilities include: kicking the desk, name calling, paper rustling, hand raising, pencil sharpening, tapping on desk, answering questions, pushing other children in line, etc.

B. Home behavior

1. Practice begins with single discriminations. After about three display examples with single behaviors for each, multiple discriminations are introduced. (It would seem wise to use only two separate behaviors or behavioral categories for practice in this section).

2. Possible home movement cycle displays:

   a. Child demands a cookie--movement cycle ends when mouth is closed and a new
request may be made.

b. Child hits sister--movement cycle ends when the child's arm is in its beginning position.

c. Child obeys a parental request--movement cycle ends when the child returns to his beginning position.

d. Other possibilities include banging on a table, throwing a ball, opening a door, name calling, spitting, laughing, etc.

3. Multiple discriminations should be adequately separated in time. Response Unit cuing may be used for initial displays.

V. Review/evaluation questions

A. Question should tap the student's understanding of the basic definitions which will be used in subsequent tapes. The pinpointing of simple behaviors should be easily accomplished. In addition, the criteria for determining a movement cycle should be well understood. Correct answering should require conceptual understanding as well as identification skills.

B. Questions should serve both evaluative and review functions although feedback will be given only for correct answers indicated by the Response Unit's green light.
APPENDIX #3

Quantification of Behavior
(Sample Script)
Quantification of Behavior--Tape #3

In the last tape we taught you how to specify target behaviors into units and categories which could be scored.

This tape is entitled Quantification of Behavior and is designed to show you how to score behaviors once they are pinpointed.

We will be describing response strength in terms of five measures:

---frequency, ---rate, ---duration, ---latency, --- and intensity.

The most simple type of quantification measure is:

frequency--or the number of times a particular pinpointed behavior occurs.
Let's say that a child cries three times. The frequency of crying behavior is three. All we have done here is to count each instance of the behavior or complete movement cycle.

Watch this scene and let's count each time this child is out of his seat.

Taped display #1

Child at school who is in and out of his seat

What was the frequency of out-of-seat behavior?

1. 1
2. 2
3. 3
4. 4
5. 5

The correct answer is four since four complete movement cycles occurred. If you missed this question, please pay close attention to the next display.

Here Johnny hits his sister. What is the frequency of his hitting behavior?

Taped display #2

Home scene, living room, child repeatedly hits his sister in a fight over a toy

What is the frequency of Johnny's hitting behavior?
Five complete hitting movement cycles were involved. Therefore, the answer is five.

Knowing that a scoreable behavior occurred a given number of times aids us somewhat, but it is evident that we need to quantify more precisely in order to properly analyze the situation. Frequency measures tell us how many times something happens, but we cannot compare counting sessions for a target child or between children unless the observation or counting periods lasted for exactly the same amount of time.

In order to compare observations we use the concept of

\[
\begin{align*}
1. & \quad 1 \\
2. & \quad 2 \\
3. & \quad 3 \\
4. & \quad 4 \\
5. & \quad 5 \\
\end{align*}
\]

Rate refers to frequency over time.

In this way we take a measure of frequency of behavior within certain time intervals—like per second, per minute, per hour, per day, etc. By putting frequency over a common time scale; such as seconds, hours or days, we can compare observations of different children or at different times.
Rate is, therefore, a very important concept and one we will have to learn in order to do observation.

Using the previous example, five instances of hitting behavior, occurring in five minutes of observation, equals a rate of one per minute.

If our observation period were five hours and we still recorded only five instances of hitting, the rate would be one per hour.

Let's practice—a child is observed making ten requests for assistance from his teacher during five hours of the school day.

Our equation, rate equals frequency over time would give us a rate of ---?

The correct answer is two per hour.

One more practice session for good measure. Two instances of a scoreable behavior are recorded in a four hour observation period.

The rate per hour is ---?
V.O. Remember the frequency is two, the time is four hours.

c(3) S4 Rate equals---?

1. 1/hour
2. 2/hour
3. 8/hour
4. .2/hour
5. .5/hour

c(1) MS Host include board Host writes on board - frame board (1)

c(2) MCU Host The answer is two over four hours or point five (one half) per hour ---.

Some types of behavior occur only once or twice in a day. Such behaviors would then be described in terms of a rate of one or two per day, rather than a small fraction per hour. Being late for school, for instance, would be a behavior which may occur a maximum of once per day. Instead of expressing the rate in terms of a fraction per day, one could use a weekly rate.

Let's try this one:

A child who is tardy two times in two school weeks of the observation period has a tardiness rate of ---?

1. 1/school week
2. 2/school week
3. 3/school week
4. 4/school week
5. 5/school week
The correct answer is found by dividing two occurrences by two school weeks which equals one per school week---.

Sometimes behaviors may occur at a high frequency in a short amount of time. Other times behaviors may be infrequently emitted over a long period of time.

Simply use the time unit which seems most appropriate to the situation and avoid small fractions.

Rate of behavior is the most often used measure of response strength. In all of the situations to be described in this tape, the measure rate is first calculated. Duration, latency and intensity are then used where appropriate for additional quantification or where rate is too low to be meaningful.

Duration of behavior or duration of a movement cycle is important when the length of time the response occurs is a characteristic being evaluated.

For example, the rate of a child's crying may be relatively infrequent, but the duration may be excessive.

What if a child cried for three or four hours at a time?

Likewise, talking in a classroom is generally tolerated if it occurs at a
very low rate and for a brief duration. If the rate remained the same but the duration of each occurrence began to increase, the teacher might soon become intolerant of the talking.

Duration would be a measure to be used in addition to rate whenever each occurrence of a scoreable behavior can vary greatly in the time it takes to complete one movement cycle.

For instance, crying or a tantrum may last for one minute or for ten minutes or more. Such situations would be best described if duration were included in the observation data.

For which of the following behavioral categories would the inclusion of duration be appropriate?

1. Bed wetting
2. Stealing
3. Screaming
4. Breaking a leg

The correct answer is "screaming" since this behavior could be scored once for an occasion lasting only three seconds or for one which went on for several minutes or more before stopping.

Try one more. Which of these categories would gain significant accuracy if the measure duration were included?
1. Solving math problems
2. Being late to school
3. Insulting the teacher
4. Hitting a home run

If you answered number two, "being late to school", you were correct.

Simply use measures of duration whenever a behavior can vary considerably in the length of time it takes to complete one movement cycle.

Another time measurement which is useful in some cases is latency

Latency is a measure of the time between the onset of a cue for behavior and the actual occurrence of the cued behavior.

An example can be made with a stop light. When the light turns red or green, specific driving behavior is being cued. There are acceptable limits for the latency of a response; i.e., the time it takes to stop or go following a red or green light. If the latency is too great, that is, if it exceeds a level acceptable to most people, a problem develops and the person behaving may be honked at or given a ticket.

The problem may not be his behavior per se. The person does stop or does go.
The problem is the latency or time it takes for the response to occur.

We will be exploring cues and reaction behaviors, in the next tape, and will get some additional practice at determining latency at that time. For now, we can consider a few examples.

Let's say that a boy is asked to comply with a parental request to pick up his toys. The child may react very quickly or he may continue to play for five minutes before doing as he was asked.

The time interval from when the request was made until the child complied is the latency period.

A parent may scold a child for something he or she did, five hours before. The latency would be five hours—.

Any two events that are logically connected may be expressed with a latency measure, but its use is usually restricted to interval periods which are out of the normal range as defined by an observer or significant other.

The concept of latency will become clearer after viewing the next tape, but before that, in which of the following situations might you include latency data to present a clearer picture of
what you observed.

1. A child tantrums 20 seconds after being told that he can't have an ice cream.

2. A girl hits her brother immediately after he calls her a name.

3. A child is punished for breaking a vase, one day after it occurs.

4. A mother praises her son for making his bed one minute after he finishes.

The best answer is number three, involving a child who is punished one day after the act is committed.

All the other examples involve behaviors that were initiated within a reasonable time before or after some logically connected event.

One additional measure of response strength may prove useful in making exact descriptions of observed behavior.

Intensity refers to the magnitude, severity or degree of a behavior.

Let's look at two children who are tantruming.
Taped display #3-split screen

Left--boy tantruming violently
Right--boy tantruming with greater intensity

The boy on the right is clearly having a more violent or severe tantrum than the boy on the left.

Taped display #4-split screen

Left--girl tantruming
Right--boy tantruming with greater intensity

In this display, the boy on the right is tantruming more intensely than the girl on the left, although neither is behaving as violently as the previous two children--.

Likewise, a fight between siblings may be verbal or it may involve violent physical contact. A parent may punish by scolding or he or she may spank a misbehaving child. An argument could involve a mild criticism of another, a heated emotional and physical exchange or any description in between. All these variations may be expressed as differences in intensity with the qualifiers mild, light, moderate, severe, intense or other suitable adjectives.
Intensity is always a qualifier to some other measure or measures and should be used only to gain added descriptive power.

Taped display #5--split screen

Left--boy jumping in a chair
Right--boy jumping vigorously in a chair

The behaviors of the two boys in this display would both be pinpointed as jumping in a chair. The child on the right, however, is clearly displaying more intense behavior and description should include an intensity qualified adjective. For example, "vigorous jumping in a chair".

As with the other measures described, the concept "intensity" will help to develop your quantification skills so that the data you record would be very similar to that which I would record in the same situation.

In this way, behavioral scientists could interpret your data as if they had collected it themselves.

Now for a review.
LIST OF GRAPHICS--TAPE #3

Film-chain slides (S)
Rear projected or film-chain slides are made from headliner type in proper aspect ratio.

S1: FREQUENCY

S2: 1. 1
2. 2
3. 3
4. 4
5. 5

S3: 1. 1/hour
2. 2/hour
3. 3/hour
4. 4/hour
5. 5/hour

S4: 1. 1/hour
2. 2/hour
3. 8/hour
4. .2/hour
5. .5/hour
S5: 1. 1/school week
2. 2/school week
3. 3/school week
4. 4/school week
5. 5/school week

S6: DURATION

S7: 1. Bed wetting
2. Stealing
3. Screaming
4. Breaking a leg

S8: 1. Solving math problems
2. Being late to school
3. Insulting the teacher
4. Hitting a home run

S9: LATENCY

S10: 1. A child tantrums 20 seconds after being told that he can't have an ice cream.
2. A girl hits her brother immediately after he calls her a name.
3. A child is punished for breaking a vase one day after it occurs.
4. A mother praises her son for making his bed one minute after he finishes.

S11: INTENSITY
Previously recorded video taped displays (VTR display)

1. School situation, child gets out of his seat and returns four times.
2. Home scene of child in the living room hitting a younger sister five times.
3. Split screen effect. Boy on the left is tantruming violently. Boy on the right is tantruming with greater intensity. Scene continues with a cut to display #4.
4. Split screen effect. Girl on the left is crying and jumping. Boy on the right is kicking and screaming.
5. Split screen effect. Boy on the left is jumping in a chair. Boy on the right is jumping vigorously in a chair.
Movable Graphic (MG)

The basic form is: \[ \text{Rate} = \frac{\text{Frequency}}{\text{Time}}. \]

Cards slide to reveal different numbers or words above and below the division line and after an equals sign. Although only one long card is actually used, each graphic change will be indicated by an independently numbered card.

Card 1 \[ \frac{\text{Frequency}}{\text{Time}} \]

Card 2 \[ \frac{5}{5} \text{ minutes} = 1/\text{minute} \]

Card 3 \[ \frac{5}{5} \text{ hours} = 1/\text{hour} \]

Pan-Graphic (PG)

\[
\begin{array}{ccccc}
\text{FREQUENCY} & \text{RATE} & \text{DURATION} & \text{LATENCY} & \text{INTENSITY} \\
\end{array}
\]
Camera blocking symbols

(1), (2), (3) ...... Camera in use
D .................... Dissolve
C (c) .................. Cut or Take
V.O. .................. Host's voice on audio, other video
LS ..................... Long shot
MS ..................... Medium shot
CU ...................... Close-up
MLS .................... Medium long shot
MCU .................... Medium close up
APPENDIX #4

Stimulus Events
(Content Outline)
Stimulus Events--Tape #4

I. Pre-organizational material
   A. Stimulus events defined, rationale
   B. Antecedent events
   C. Consequent events
   D. Practice in observing stimulus events
   E. Review/evaluation questions

II. Stimulus events
   A. Definition and description
      1. Stimulus events are defined as events that are functionally related or connected to target behaviors. The connection comes from the fact that such behavior has been rewarded in this context or stimulus situation and is thus more likely to occur there.
      2. General examples are given; e.g., as described in Tape #3--the behavior of a child complying with a parent's request to pick up his toys is functionally connected to the request itself. A parent's scolding behavior has a functional connection with the behavior for which a child was scolded. Likewise, being in school has a connection with a
child's behavior of raising his or her hand in class. Hand raising behavior emitted in other contexts, such as in church or at the movies, would not usually be rewarded. It is, therefore, not functionally related to these stimulus contexts.

3. Like target behaviors, stimulus events may be pinpointed and quantified.

B. Rationale

1. In order to understand the function of a behavior, any logical connection with events preceding it or following it must be explored.

2. Certain target behaviors may be triggered in specific circumstances. Other behaviors may occur only in situations that are likely to lead to some specific result. For this reason, the observation and recording of specific circumstances and results are important in this training program.

III. Antecedent events

A. Description

1. Antecedents are defined as functionally connected stimulus events which occur before a target behavior is emitted. Antecedents may be thought of as cues which indicate
that some behavior may be emitted in order to accomplish some result. A red light cues the driver to stop to avoid a possible accident or ticket.

B. Examples of antecedents are given with a list of possible behaviors that may result from each situation.
1. A parent asks a child to do something. The child may comply with the request or he or she may ignore it.
2. A parent may deny a child's request. The child may plead, cry, tantrum, remain silent, etc.
3. A teacher asks a question of a pupil. The pupil may respond, remain silent or engage in other behavior. If a response is made, it may be correct, incorrect or partially correct.
4. A pupil may hit another child. This child may strike back, cry, tell the teacher, etc.

C. Setting events
1. A setting event is defined as a type of antecedent which cues for a general class of behavior rather than a specific response.
2. Examples are given. Being in school, at home or on the playground may cue different
kinds of behaviors. The types of behaviors that such a general setting may prompt are, of course, more varied than those prompted by more specific antecedents.

3. Setting events and antecedents are often used synonymously due to a large degree of definition overlap. The presence of a substitute teacher may cue more specific behavior than just being in school, but a particular request this substitute makes is more specific than her mere presence.

IV. Consequent events

A. Description

1. Consequent events are described as events which occur as a consequence of some behavior emitted by the target child.

2. Consequences may be the presentation of rewards, punishments, or the removal of either.

B. Examples of consequences are given. Antecedents are included for practice in developing a more generalized conceptualization of the goals of observation.

<table>
<thead>
<tr>
<th>Antecedent or Setting Event</th>
<th>Behavior</th>
<th>Consequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent denies child's request for a cookie.</td>
<td>Tantrum</td>
<td>(a) Child is sent to his room or (b) Child gets cookie or (c) Child is ignored</td>
</tr>
<tr>
<td>Antecedent or Setting Event</td>
<td>Behavior</td>
<td>Consequence</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>2. Substitute teacher</td>
<td>Child throws</td>
<td>(a) Child is sent to the office or</td>
</tr>
<tr>
<td></td>
<td>eraser</td>
<td>(b) Child is rewarded by the laughter of peers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(c) Child is scolded, etc.</td>
</tr>
<tr>
<td>3. Child is asked to</td>
<td>Child</td>
<td>(a) Child is punished</td>
</tr>
<tr>
<td>clean up room</td>
<td>refuses,</td>
<td>(b) Child is ignored</td>
</tr>
<tr>
<td></td>
<td>yells &amp; screams</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(a) Child is rewarded</td>
</tr>
<tr>
<td></td>
<td>cleans up room</td>
<td>(b) Child is ignored</td>
</tr>
<tr>
<td>4. Disliked pupil calls</td>
<td>Child</td>
<td>(a) Second child kicks back</td>
</tr>
<tr>
<td>target child a name</td>
<td>kicks</td>
<td>(b) Teacher catches first child and scolds him</td>
</tr>
<tr>
<td></td>
<td>second</td>
<td></td>
</tr>
<tr>
<td></td>
<td>name</td>
<td>(c) Both are ignored, etc.</td>
</tr>
</tbody>
</table>

V. Stimulus events observation practice

A. Displays are presented which provide students with the opportunity to observe and discriminate stimulus events. Simple identifiable antecedents such as commands or requests can be prompted at first with the Response Unit's cue light. Later discriminations would be unprompted.

B. Target behaviors are viewed in the context of the total behavioral situation for the first time in this tape. A variety (three or four) of
situations should be presented as in the examples given in this and earlier tapes.

C. A short display, complete with antecedent, behavior, and consequence is presented at the end of this practice session on the top half of a split screen effect. The bottom half displays an ABC log which is being appropriately filled in by an observer viewing the scene above. No student responding is called for on this preview display.

VI. Review/evaluation questions

A. Questions should call upon a student's ability to define antecedent or setting events as well as consequent events.

B. Pinpointed behaviors are presented along with a running account of prior and later events. Students should identify the antecedents and consequences from a list of possible choices.
APPENDIX #5

Recording Methods
(Content Outline)
I. Pre-organizational material
   A. Continuous recording technique
   B. Specialized logs and techniques
   C. Time sampling techniques
   D. Coding
   E. Review/evaluation questions

II. Continuous recording techniques
   A. Rationale--why and when to use
      1. When antecedents and consequences are unknown, a running account of all events in the child's lifespase is recorded.
      2. Continuous recording is used to identify target behaviors in the context of the environment. Later, more specific logs can be used to isolate target behaviors.
      3. Continuous recording gives us data on the adaptive as well as the maladaptive behavior of the target child.
   B. Naturalistic logs
      1. A pad of paper and a pencil or pen are the only pieces of equipment necessary.
      2. Two examples are given utilizing the split
screen technique. Behavior displayed on the top half of the screen is simultaneously recorded on the log displayed below. Scenes should be chosen which would allow the observer to describe the action with complete words; i.e., a slow pace to allow sufficient time for non-coded recording.

3. Codes (some examples to be given later in this tape) can aid the observer by shortening the writing time involved.

4. A blank naturalistic log is displayed. The heading includes spaces for writing in the name of the target child observed, the time of observation, the place where observation took place, other relevant information and the observer's name.

C. ABC logs

1. Initial observation can also take place with an ABC log. This form includes all the basic information required for the naturalistic log.

2. All behavior, both deviant and appropriate, is recorded on this form of the ABC log.

3. Continuous recording is accomplished by identifying antecedents (A), behaviors (B), and consequences (C).

4. This form, although somewhat more difficult
to use for continuous recording, is easier to interpret later.

5. An example is given with a form containing the same heading as the naturalistic log but including three vertical divisions of the sheet with the column headings Antecedents, Behaviors, Antecedents or simply A, B, C.

6. A split screen display can again be used to demonstrate its use.

7. After this demonstration, a preview of an ABC log which includes a time column is shown.

III. Specialized logs and techniques

A. Rationale—why and when to use

1. Specialized logs are often developed from naturalistic logs after target behaviors are identified and pinpointed.

2. Specialized logs save time by concentrating only on the behaviors of interest.

B. Event recording

1. If only one or a few specific behaviors are to be observed, event recording (event sampling) may be used. The frequency or duration of a specific discrete behavior such as pages completed or tantrums thrown is recorded for a specified period of time.
This time interval is usually based upon an extended period such as a classroom period or day.

2. Events can be recorded on an ABC type log with an additional column for time of day or they can be tabulated with pencil marks on a piece of paper or with mechanical counters.

3. Examples such as answers correct, spit balls thrown, books dropped, doors slammed, etc. are given with split screen displays of a targeted behavior and the recording involved.

C. Duration recording

1. Duration recording is a specialized form of event recording which gathers data on the length of time a behavior is emitted.

2. The log form may be identical to that used for event sampling of behaviors not requiring measures of duration.

3. Duration recording is used for behaviors which vary considerably in length. Previous duration examples (crying, tantruming, yelling, etc.) are repeated for clarity with the use of this form.

4. The split screen effect can be used to demonstrate. The top half of the screen
displays a child's behavior (e.g., crying). The bottom half demonstrates the duration recording form and a stopwatch. The observer in the display fills in the duration column at the end of the displayed behavior above.

IV. Interval and time sampling

A. Rationale--when to use

1. For very high frequency behaviors, an observational sample taken at regular or random intervals can give a good indication of the strength of the response without necessitating constant monitoring. This is especially important when teachers must record behavior and teach a class at the same time.

2. When more than one child is observed within the same observational period.

3. When behaviors are not clearly discrete; such as when pupils make disruptive noises, tap pencils on desks, move chairs around, etc.

B. Recording intervals

1. The presence or absence of behavior may be scored within short, uniform time intervals.

2. If one child only is observed, intervals may be continuous; e.g., every 15 seconds a child is scored for moving his chair about or not. If during one interval the behavior occurs
at all, it is scored for this interval with a plus, a check or some mark. Non-occurrence would be either not scored, scored with a minus or with some other convention. The total observation time spent in recording continuous intervals may be 10 minutes, 1 hour, or 10 minutes at the beginning of each hour, etc.

3. Several behaviors may be arranged vertically for each recording interval. The appropriate boxes are checked off as the behaviors occur.

4. Categories of longer duration; such as sitting, reading or cooperative playing may require longer intervals such as 30 seconds.

5. Intervals less than 10 seconds are not usually used unless very subtle changes need to be demonstrated.

C. Time sampling

1. When only limited observation time is available, behavior may be scored in predetermined intervals of time.

2. For example, a 10 second interval at the beginning of each minute may be scored for the presence or absence of specified behaviors.

3. Intervals may be spread out further as with
a 15 second interval every 5 or 10 minutes.

4. More than one child may be observed with the time sampling technique by e.g., scoring the presence or absence of specified behaviors for child #1 in the first 10 second interval, child #2 in the second interval, etc. Ten or more complete cycles (each child being observed for 10 or more intervals) may complete one day of time sampling.

D. Practice

1. A corner insert of a watch is presented together with observational displays. Trainees indicate the presence or absence of specified behaviors by responding with the Response Unit.

2. Practice is given in interval and time sampling procedures.

V. Coding

A. Rationale

1. Coding is a form of observational shorthand. It can save an observer's time and effort.

2. Due to the reduction of writing time, coding offers more time for observing behavior, possibly resulting in more complete data.

B. Description

1. Individual behaviors as well as behavioral
classes may be indicated by codes.

2. Abbreviations or codes can be used for designating the target child or anyone in the behavioral field.

3. Antecedents, consequences, motion towards or away from—in fact, any recordable event can be represented with a code, letter or symbol.

4. Caution should be urged in attempting to use or learn too many codes at once.

5. It is suggested that each observer gradually develop a coding system with which he or she feels comfortable.

C. Examples of coding conventions

1. The target may be indicated by a T or S (for subject of the observation) or the first initial of his or her first name.

2. Family members may be similarly coded as with an M for mother, F for father, S1 for youngest sister, S2 for next oldest sister, B1 for youngest brother, etc.

3. Behaviors of the target child can be abbreviated as: La = laughed, Ta = tantrum, Cr = cry, Ye = yell, Co = compliance, NC, or nCo = non-compliance, Pl = play, etc.

4. Behaviors or categories for others in the behavioral field can also be coded; e.g.,
AT = attention, NR = no response, CM = command, RC = receive, TH = touch, etc.

5. Observers may prefer different forms in particular situations; e.g., + = praise, 0 = ignore, —— = punish, etc.

6. Direction of conversation may be indicated by a dash; e.g., mother speaking to target = M-T. Physical direction or movement may be coded with an arrow; e.g., target goes to mother = T→M.

7. Behaviors occurring frequently may be designated with numbers instead of letters. If a special place on the log is made, simply use a mark in that area for each occurrence of the behavior observed.

8. Split screen display can be used to demonstrate coding conventions.

VI. Review/evaluation questions

A. This tape concludes instructional training for parents and teachers who are primarily interested in producing baseline data for a single target child with few target behaviors. Observers stopping their training here are expected to have gained sufficient knowledge to develop a chart form and recording style for their particular usage. Since a large amount of information
is presented in this unit, it is expected that continuing students will review this tape at least once before going on. Likewise, parents and teachers who do not find an appropriate form and style will also view this unit again.

B. Questions should be of moderate difficulty and a statement should be made concerning the high probability that this unit will be missed on the first viewing.

C. Although basic observational training ends with this tape, practice in observing behavior similar to that emitted by their children or pupils may prove valuable for parents and teachers. For this reason, three separate practice tapes will be available. Parents will describe the types of behavioral problems they encounter with their children with a behavioral check list and a written description. At the determination of the principle investigator, parents are guided to either tape 6a or tape 6b for practice in recording behavior similar to that which they encounter with their children. Teachers will be directed to view practice tape 6c for experience in recording typical school behaviors.

D. Continuing students are advised to view all three of the practice tapes to gain experience in
the variety of situations they will encounter in their later work.
APPENDIX #6

Recording Practice
(Content Outline)
Recording Practice--Tapes #6a, 6b and 6c

I. Tape 6a--General problem behavior
   A. Twenty minutes of home behavioral displays are presented in this tape.
   B. New situations not previously used in preceding tapes or longer versions of previous displays are presented.
   C. A total of three or four sequences dealing with non-compliance, tantrums, hitting, yelling, object throwing, etc. may be used.
   D. A parent will view one complete sequence of one target child and design a recording log and style appropriate for it. The section is then reviewed and data is recorded.
   E. No evaluation questions are asked for any of the practice tapes, but accuracy may be checked against an official count available from the tape librarian when the tape is returned.

II. Tape 6b--Home problems with emphasis on the parents' response.
   A. Three or four sequences are presented in which the parents' response to a child's deviant behavior is clearly inappropriate and/or inconsistent.
B. The child's behavior should be different from those used in tape 6a.

C. Trainees will also view this tape twice; first to develop an appropriate log and recording style and then to actually record data.

III. Tape 6c--School problems

A. A classroom of 8-10 pupils is displayed for the entire 20 minutes.

B. Three or four of the pupils exhibit school problems of one kind or another.

C. Teachers are advised to use the time sampling method on individual pupils and on the whole group at the same time.

D. A corner insert of a clock or stopwatch is displayed on the screen for the duration of the tape so that consistency of data collecting will occur in subsequent viewings.

E. Presenting all pupils at once will allow teachers to concentrate on behaviors they may have already encountered in their classrooms while still gaining experience in multiple target time sampling.
APPENDIX #7

Charting Procedures
(Content Outline)
Charting Procedures--Tape #7

I. Pre-organizational material
   A. Charting data for behavioral analysis
   B. Approaching new field observational situations
   C. Calculating observer reliability coefficients
   D. Review/evaluation questions

II. Charting data for behavioral analysis
   A. Rationale
      1. Baseline data from observational logs must be presented in an understandable form so that a behavioral analysis can be made. Such graphs and charts usually depict the rates of behaviors, consequences and antecedents.
      2. Once an intervention plan is begun, data is again charted to show changes that may have resulted.
      3. Baseline data may be presented on the same graph as acquisition (intervention) data. The results of later intervention changes (such as discontinuing it for a while) may also be represented on the same graph. Such a pictorial representation of data provides information on the function of a behavior in
the context of environmental stimulus events and demonstrates the success of initial intervention attempts.

B. Acceleration, deceleration and maintenance

1. Changes in the rate of a behavior over time gives information on the success of the intervention plan. Based upon these changes, the intervention is either modified or continued without change.

2. The terms acceleration, deceleration and maintenance are used to denote increases, decreases or no change in the rate of behavior from the baseline phase to intervention. These terms are also used when pre-intervention contingencies are again reinstated.

C. Arithmetic scale graphing

1. Observational data can be displayed on standard graph paper. The ordinate is usually used to plot frequencies or cumulative duration. The abscissa usually denotes a unit of time--most often days or observation periods within days.

2. Standard arithmetic graph paper is best used for charting behaviors that have a frequency range within the limits of the paper. That is, if there are 40 horizontal lines per
sheet, a range of about 30 movement cycles or less from lowest to highest would be acceptable. Since later intervention rates must also be displayed on this graph, it is wise to anticipate a possible reduction or increase in rate. If the maximum anticipated range is not within the limits of the paper; i.e., with initially high frequency behaviors, a logarithmic scale should be used.

D. Logarithmic scale graphing

1. Whenever the range of data to be displayed exceeds the limits set by standard graph paper, log or semi-logarithmic charting should be used.

2. Six cycle semi-log chart paper is specifically designed for use in analyzing human behavior. It allows absolute data to be retained when relative comparisons are made among several behaviors which vary greatly in frequency.

3. Since an excellent program for teaching semi-log graphing already exists (Kunzelmann, et al., 1970), trainees are provided with video rationale only. They are directed to complete this written program at the conclusion of the tape.
E. Reversal chart design

1. The reversal chart simply divides the abscissa time dimension into columns representing different phases of baseline or intervention.

2. Both arithmetic and semi-log scales may depict data collected in these phases. The baseline, intervention, baseline, intervention (ABAB) sequence is especially useful in analyzing human behavior.

3. One or more behaviors may be represented on the same reversal chart.

F. Multiple baseline design

1. When target behaviors appear irreversible or if a reversal is undesirable, the multiple baseline design may be employed.

2. Baseline data is collected for a number of responses separately. The experimental variable (intervention) is introduced to one behavior or behavioral class at a time. Changes are noted in behaviors for which no intervention was initiated. The intervention may then be applied to another behavior for which baseline data exists. In this way the effectiveness of the intervention may be demonstrated without returning to the
original contingencies.

III. Approaching new field observational situations

A. Unobtrusive identification of target

1. Trainees are told that the observer's presence in a field situation may alter the behavior that is being observed. This observer effect may be minimized in several ways.

2. Observers should instruct adults in the environment that they should not interact with them during the observation period.

3. Targets can be verbally pointed out to the observer without alerting the child.

4. Some explanation for the observer's presence should be made (when necessary) which is not likely to alert the target child.

5. Any adult discussion which may cue the target as to the nature of the observer's presence should be cut off.

B. Avoiding eye contact

1. Direct eye contact made with the target child can alter the child's behavior.

2. Observers should choose a vantage point which will reduce the possibility of eye contact with the target.

3. If eye contact is made, it should be broken
immediately in a normal appearing way.

4. The use of mirrored or dark sunglasses may aid this problem in some situations.

5. A video display may be staged in which an observer arrives at a school classroom and demonstrates the suggestions given in A and B above. A similar demonstration may be staged in a home situation.

IV. Observer reliability

A. Rationale

1. The similarity of one observer's data to another's, collected at the same time on the same target is termed reliability.

2. Observer reliability assesses a) the observer's skill, b) the appropriateness of the categories used and c) the suitability of the log form. In short, reliability refers to how much the data can be relied upon as a measure of actual occurrences.

B. Calculating the reliability coefficient

1. Whenever two or more observers simultaneously collect data on the same situation, a reliability coefficient may be calculated.

2. One common method for calculating reliability is done by dividing the total number of agreements by the total of both agreements and
disagreements. This result is multiplied by 100 to read in percent of agreement.

3. Several graphic demonstrations should be made to insure understanding.

V. Review/evaluation questions

A. Trainees should be tested on their understanding of major concepts in the usual manner.

B. A packet of written material should be distributed at the end of this tape. Kunzelmann's charting program should be first worked through.

C. Raw data samples should then be converted into the chart forms described in the tape. When the tape and written materials are returned to the tape librarian, students may pick up feedback charts of the correctly displayed sample data.
APPENDIX #8

Video Training Device
(Description)
Video Training Device

In 1972 construction was begun on an electronic video tape training device. This prototype unit had three discrete channels and used mechanical counters to store subject response information. Video tapes were first encoded with an electronic signal. On playback this signal was again decoded and correct or incorrect responses were counted. The unit was designed to use only solid state components so that compactness could be gained without sacrificing reliability.

Several limitations of this design were noted after successful debugging was completed in 1973. Three response channels were insufficient for many applications and no data was available for performance on individual trials. Counter reading was seen as inconvenient and several new functions would be required for use with completely programed video material. The design and development of the improved version was begun in late 1973.

Final detailing and debugging of this unit is expected within the month. The following description is viewed from researcher and subject perspectives.
1. Physical-Technical Description

**Logic Unit**

The logic unit measures 40 cm. x 26 cm. x 7-13 cm. Within its walnut sided, sloping faced cabinet lie the logic circuits, the printer mechanisms and other electronic components. Forty integrated circuit (I.C.) "chips" are mounted on five very compact boards representing the thousands of transistor circuits used in this design. Matrixed signals are decoded from the audio track of the video tape and routed to the computer logic. The entire front cover is hinged at the top so that easy access is made to the line printer's paper feed mechanism. A connection is made from this unit to the video tape recorder's left audio channel (record input and audio out).

**Subject's Response Unit**

The response unit measures 10 cm. x 10 cm. x 4 cm. including the walnut housing. A telephone-type 9 button keyboard is mounted behind an aluminum panel with adjustable settings to reduce accidental responding. A two color bar light is mounted above the keys. The left part of the bar is amber and labeled "RESPOND". The right side light is green and is labeled "CORRECT". The encoding mechanism and transistor drive circuits are also housed within this unit. A 22 foot cord connects this unit with
2. Subject Use

Subjects make responses only when the amber response light is activated. Pressing a key at any other time will have no effect. With the amber light on, a response will immediately inactivate it. If the response is incorrect, nothing further will happen until another discrimination is called for. A correct response will immediately (within one hundredth of a second) inactivate the amber light and activate the green light. The green reward light will then remain lighted for two seconds. Subjects can review their performance by asking to see the data tape after returning the video cassette.

3. Researcher Use

Preparing the Video Tape

Before a video tape can be used with the training device, it must be encoded with the appropriate signals. The cassette recorder to be used has three separate information channels; one for the video and two for audio. The original recording should be made using the video and right audio channels only (a normal studio recording procedure). The left, "dub" channel is used for encoding the appropriate signals with the training device. The
tape is played in the "audio dub" mode of the recorder and the "record" mode of the training device. As soon as the tape is up to speed, the "START" button on the logic unit is depressed. This will feed in the tape number information which was pre-set on the digit selector on the front panel. As questions or discriminations are called for, the researcher simply depresses the appropriate button on the subject's Response Unit. Mistakes made in encoding the tape can be easily corrected by rewinding and repeating the section. At the end of the tape the "END" button is depressed. This signal will eventually activate the rewind and shut down mechanisms when the prepared tape is played back.

**Playback Instructions**

For use in training, the logic unit is turned on. The circuitry requires very little current and is best left on for an entire day of use. The digit selector previously used for preparing the tape is now used to limit the response time a subject has before the amber light on the Response Unit is inactivated. Once this is set (usually the same for all subjects run in one day), no further attention is necessary. The data tape will automatically print out the tape cassette used, the number of the subject (in order from the first of the day), the question number, the correct answer, the subject's answer and the
latency (in tenths of a second) from when each question was asked until a response was made. When the "end" signal is decoded, the total number of correct responses, and the total latency will be printed in red. The data tape will then automatically advance itself for easy removal. Data tapes may be removed after each subject or at the end of the day, should this be desired, since the device will automatically begin with another subject with no attention necessary from the researcher, assistant or tape librarian.

4. Planned Elaborations

Additional programing flexibility would be gained if each tape could be divided into sections requiring independant continuation-criterion scores for advancing to the next section. If a section were missed, it would automatically rewind and repeat itself. Such a system would require an additional logic interface with the recorder's tape drive mechanism. If this automatic rewind-repeat function could be incorporated, a measure of total time spent in training should be available. Other information such as the date and time of day may also prove valuable.