NEW APPROACHES TO SOCIAL INSTRUCTION

A. S. BLAIWES and D. R. WELLER[1]
Naval Training Equipment Center

INTRODUCTION

This project reflects, along with an expanding realm of related events, a basic philosophical revolution that appears to be occurring in our society. A consideration of these philosophical issues is important to a fuller understanding of the research and development reported herein.

Major transformations are seen to be underway in our attitudes about war, ecology, life purposes, human capabilities, and social action. A common thread seeming to run through a variety of such complex attitude changes is the idea that human beings must be capable of a lot more harmony within themselves and within the universe. Hence, "harmony" is the keyword underlying a philosophical revolution that is making its influence felt in a variety of areas of human concern.

One of the major ends sought by the "harmony" revolution is man's harmony with other men. Harmony as a goal evolves from materialistic goals where man defined the better life as food on the table and a roof overhead. Consistent with these lower level goals were lower level means. Man has been a manipulator and exploiter of other men. Manipulation served man well in overcoming the obstacles that he defined as standing in the way of his materialistic goals.

Changes in the emphasis among goals, from material to harmony, have necessitated changes in the means to reach the goals, from manipulation to humanity. Thus, the new philosophy is grounded, in large part, on new, more humane definitions of man. "Man's inhumanity to man" has become a catch phrase calling attention to the incongruity that arises when one considers "man's inhumanity" in relation to a growing conception of man as a being of great, barely tapped potentials.

These changes in philosophy are reflected in the conceptualizations of two types of leaders contained in a leading theory of social interaction (McGregor, 1960). In this theory, theory X leaders define man as disliking and avoiding work and, therefore, needing coercion. Along more humanitarian lines, theory Y types believe that work can be as natural as play and people can learn to accept and seek responsibility. Theory X types of leaders engage in the kinds of activities that are associated with the older conceptions of "man the manipulator." Such activities, in turn, give rise to concern from supporters of the new philosophy that the new goal of "harmony through humanity" is being violated.

Not all people consider it wise to adopt the new philosophy. Nevertheless, for better or worse, the philosophy has arrived in our society and, being sensitive to the rest of society, the Navy is moving toward its goals. The change from the old to the new philosophy, however, has left some gaps. Old methods of social influence (e.g., threats of severe punishment) are less appropriate and new methods have to be instilled in their place. Thus, now, more than ever, training programs are needed that teach Naval leaders how to make their organizations more effective through principles consistent with the new attitudes of man.

This project, being an effort to provide such a training capability for recruit company commanders (CC's), should be evaluated in terms of its contribution to the effectiveness of the organization (e.g., the success of the recruits after their basic training; the speed of recruit learning during basic training). But, such indices of performance are a function of some factors (e.g., political behaviors, composition of the company) not under the control of the individual or the training program. Further, the long time intervals required to gather data more directly related to organizational success (such as recruit performance after the recruit training period and the successes of CC's on subsequent duty assignments) are a discouragement. The pursuit of such measures would become more reasonable after results from more immediate measures indicate that training effects might be found in these more elusive and less direct criteria.

Thus, perhaps the most important criteria for judging the success of this project at the present time are the extent to which: (1) the training is instrumental in getting

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1 Appreciation is expressed to all persons who contributed to this project, including contractors and military personnel, a list of whom would be too lengthy to include here. Major portions of the project were undertaken by J. Cohen, M.Fishbein, G.Spencer, D.Hauser, W.R.Brown, D.C.Wightman, K.O.Tyson, J.E.Hearn, L.T.Luck, M.G.Smith, D.Hammer, H.R.Berry, and M.Shore.

students to do on-the-job what the organization considers good to do (where this does not conflict with scientific knowledge); and (2) the behaviors so provided by the instruction are instrumental in contributing to subgoals of the organization.

Since the subgoals (e.g., morale of company, the recruits' training scores) are considered to be correlates of the major effectiveness goals, information about the achievements of the subgoals would indicate the practicality of pursuing measurement of the more major goals. Further, if an organization has changed its philosophy, it is critical that it provide a mechanism for implementing the new philosophy. It is not propitious for an organization (or society) to hold one view and act in accordance with another. A major question for evaluating the current training program is how well the program allows the ideals and actions of the organization to become one. Thus, the present project will be considered successful to the extent that it provides and/or refines the mechanisms for implementing the new philosophy such that it (the philosophy) might reach its potential and evolve to newer and even better forms. At this point, the best indicators of such success are the types of behaviors and subgoals mentioned in the foregoing.

THE TRAINING REQUIREMENT AND GENERAL APPROACH: A FRAMEWORK FOR NEW CONCEPTS

The Naval Training Equipment Center, in 1972, undertook an ARPA (Advanced Research Project Agency) sponsored project to train socially-related behaviors of CC's. The main objective was to evaluate the utility of the PLATO IV computer-based education system as applied to this training and, in the process, to improve the effectiveness of the CC's with recruits. The job of a CC at a Recruit Training Command (RTC) is to take recruits through their first nine weeks of basic training and prepare them for future work in the Navy. PLATO IV consists of a large number of instructor/student terminals linked by telephone to a central processor at Urbana, Illinois. The terminal consists of a plasma tube display surface, a random-access slide projection display facility, and a response keyboard. The student/instructor can call up any one of a large pool of lessons in diverse subject matters stored at the central processor. New lessons can be readily composed by the instructor employing a special language called TUTOR. The PLATO system has been under development since about 1960.

Like most instruction for leaders, previous training for CC's stressed what they should get recruits to do (the leadership mission) but not much was offered concerning how to get recruits to do it (the leadership technique.) Instruction in the latter consisted of brief exposures to theories of supervision and human nature and from a couple of days up to several weeks of on-the-job observation of a CC leading a company ("shadowing"). The theories typically were quite general, leaving the derivation of implications concerning exactly what the CC should do in actual job situations to the student. Further, no opportunity was afforded the student to try out and perfect their notions of what these theories imply in an instructional environment. Shadowing seemed to be of considerable value; it was limited, however, to the extent that the range of observations were limited. Often only one CC was observed by each student. Thus, the student could learn only what was available from his particular situation. Also, each student had to decide for himself what of the information available is critical to learn; and whether or not he learned it was placed mainly at the mercy of his self-instructional capabilities.

These gaps in the leadership training of CC's considered together with the apparent criticality of leadership techniques to their job indicated the desirability of working with the CC population in this project. It should be noted that many areas of social influence do not offer instruction even to the extent provided to CC's. Thus, the shortcomings noted in the instruction of CC's appear to be conservative estimates of training deficiences in the general area of interpersonal behavior.

The conclusion that social behaviors require drill, practice and instruction just as do behaviors in more technical areas is a relatively new concept in itself. However, the idea that this training might be facilitated with the use of a computer is practically brand new (a pilot study by Bellman, et al. [1966] and a proposal made by Vriend [1973] are two exceptions to this). Thus, any effort to resolve some of the rather unique problems presented by this rather unique area would stand a good chance of being new, simply because relatively few people have seriously and systematically approached the same problems in the same forms before.

The development of new concepts, however, seldom comes easy. First, appropriate problems requiring resolution have to be recognized and high enough priority must be given to them to receive the attention they require. Here, the requirement to produce training programs ready for operational use constantly interfered with the pursuit of many of the problems that were recognized and, most assuredly, not all pertinent problems were even noted. Because of pressures to meet the operational training requirement, the security blanket of traditional, albeit somewhat

deficient, methodology often lulled investigation away from more interesting, but somewhat more risky, new approaches. Many problems were recognized, however, and some new solutions were tried. This paper discusses the nature and success of some of these new training concepts and how each relates to some rather unique problems in the social-skills area of instruction.

In keeping with the conference theme ("New Concepts for Training Systems), an effort was made to discuss in this report only concepts contained in the present training programs that appeared to be new and viable. These concepts were plucked from the training programs with more concern for describing the isolated concepts than for preserving the integrity of the course materials. Further, many additional characteristics of the programs appear to qualify for inclusion in this report, but were left out in the interest of time and space. Thus, the true natures of the training programs may not be very completely depicted in this report and the concepts discussed are the results of only a preliminary effort to define new contributions contained in the work. For a comprehensive view of the training programs, the reader is directed to the PLATO IV system to observe the programs directly. More comprehensive reports of the training programs are in preparation.

With these reservations in mind, the following list summarizes those aspects of the training programs under discussion that appear to represent novel and potentially viable concepts for training systems. The remainder of this report elaborates upon these concepts.

CONCEPTS RELATING TO THE COMPILATION OF TRAINING OBJECTIVES (T.O.'s)

1. New theoretical formats were developed and utilized for specifying T.O.'s and performing training analyses.

2. A new model describing functions, characteristics, and behaviors of leaders was developed and its validity and utility are being tested.

3. The model provided the basic structure for one of the training programs developed.

4. An atypical rationale for defining T.O.'s and determining their validities was employed; viz., a T.O. is "valid" and should be used if it reduces discrepancy between organizational policy and employees' perception of same.

CONCEPTS RELATING TO THE CONDITIONS FOR LEARNING THE T.O.'s

5. The leadership model was used in instruction as a "conceptual map" for learning, remembering, and using the course materials.

6. Several problems rather peculiar to instruction in the social-skills area were identified. Resolution of these problems is considered critical to progress in social-skills instruction.

7. Specific features of the training programs have been or are being developed to help resolve the problems noted, as follows:

a. The computer determines the student's perceptions of how he is evaluated by his superiors, using regression analysis. This provides a basis for modifying the student's perceptions where they are incorrect.

b. The computer helps define: (1) the student's job-related goals; (2) his position on whether or not he intends to perform each of a number of behaviors; (3) his perception of the relationship between his goals and the behaviors. Given this type of information, the computer presents information to the student regarding the value, to him, of performing certain kinds of behaviors in terms of being more facile to achieving his goals than his old behavioral tendencies.

c. Social behaviors are provided drill, instruction, and practice just as behaviors in more technical areas.

d. Facilitation of such training of social behaviors was attempted with the use of a computer.

e. The computer "personalizes" the instruction by making the student the object of good and poor leadership practices and then relating these experiences to similar experiences had by recruits.

f. The computer assists in the process of evaluating video-taped recordings of actual encounters between the students and recruits and provides instruction based on the evaluations.

g. Problem situations are presented by the computer to provide the student drill and practice in applying the concepts being taught by the programs.

h. Performance feedback given to the student on specific problem situations is individualized to account for the student's history of responding to these situations throughout training and also for the particular manner in which he chose to deal with a particular situation.

i. Case study approaches are being employed wherein the student converses with the computer in simulated dialogues with recruits. This permits the student to experience the consequences of his actions more directly.

CONCEPTS RELATING TO THE CONDITIONS FOR USING THE T.O.'s IN THE TRANSFER SITUATION

8. Efforts are made to reconcile discrepancies between organizational policies and perceptions of these policies by workers via the computer programs; thus permitting organizational reinforcement to support the behaviors in question.

TRAINING PROBLEMS AND SPECIFIC SOLUTIONS: NEW CONCEPTS FOR TRAINING SYSTEMS

The effort to remedy the deficiencies and reach the goals discussed in the foregoing consists of a consideration of the compilation of training objectives (T.O.'s), and learning and transfer problems, as follows:

T.O. COMPILATION

The difficulty in arriving at a list of materials which, at least intuitively, appears reasonable to reach the T.O.'s -- a major problem in any skill area -- is magnified in the social-skills area. With more traditional subject-matter areas (e.g., maintenance training), information can be derived from expert performers on man/machine tasks and design engineers can say very precisely how the machine operates. In the social-skills area, on the other hand, where everyone does his job differently and a variety of styles can work, there is a less direct relationship between any given set of behaviors abstracted from expert performances and success on the job. (Further, the design engineer has been relatively unavailable for consultation on how people operate.) Thus, the compiler of training objectives for social instruction is forced to consult the scientific literature, piecing together generalizations from reports of research studies on "similar" situations. This seems to be more difficult than drawing information from design engineers and expert performers where the situation being discussed is identical to that for which training is being developed.

Not only are design engineers and expert performers easier to interrogate than the scientific literature, but they are probably more often correct. Machines are inherently more predictable than human beings and the people dealing with machines on a daily basis come to know more about them than people know about people. Thus, instructional development in the social skills area is plagued with especially difficult problems associated with the definition of valid T.O.'s. This means that relatively little evidence is available to suggest that T.O.'s work. That is, if a student actually behaved in accordance with the T.O.'s specified for the social skills area, we, sadly, cannot have very much confidence in the "transfer value" of those objectives. We could not be assured that he would be more effective if he conformed to the dictates of the training than if he did not. One of the leading researchers in the area was forced to admit in a recent publication (Fiedler, 1973) that "No one has established a consistent, direct correlation between the amount or type of a leader's training and the performance of the group he leads."

Valid T.O.'s are as critical to success as they are elusive. No success can be expected, no matter how good the rest of the training, if the T.O.'s are inappropriate. This situation placed an imperative on the curriculum developers to devote major resources to the task of specifying T.O.'s. Some interesting techniques were employed for this purpose including interviews, written quesionnaires, observation, and surveys of the psychological literature. These techniques produced a wealth of potential T.O.'s from which only the most promising were selected; but the experience did little to dispel the idea that the process is a long and arduous one.

These analytic procedures constitute new concepts for training system development (especially for the social area) in that theoretical positions were employed in new ways to provide bases for much of the structure of these techniques. This resulted in a set of analytic procedures which probably differ in some major respects from any employed before.

A detailed description of these procedures would be too lengthy to present here; but can be found in some earlier publications (Spencer, Hausser, Blaiwes, Weller, 1975; Cohen and Fishbein, in press). Generally, however, one procedure employed to define T.O.'s consisted of relating "principles" of leadership (derived from a review and synthesis of relevant material from the scientific literature) to incidents derived from the CC's job. This process provided information about the interpersonal situations typically confronted by CC's on their job, typical responses made by CC's to these situations, and rules for desired responses in these situations. Several such "problem situations" were generated for each aspect of all the skill areas selected for the initial analysis. Much superfluity,

omissions, and confusion resulted when all the "skill areas" were combined into one program. To eliminate these problems, the authors re-sorted all the situations into apparently more homogeneous categories according to the skill being taught by that situation. This procedure led to more precise conceptions of the skill areas and the construction of new situations that better exemplified these new skill areas. Thusly, the course materials evolved simultaneously with the definition of the skill areas, with changes in one implicating changes in the other. A report of a recent version of the course materials is in preparation. A recent version of the structure of the skill areas is shown in Figure 1.

The process of deriving implications from the psychological literature for the development of leadership training materials has resulted in a new answer to the old question of what leaders should do. This answer says (see Figure 1) that leaders should do three main things: (1) tell others what to do (set goals); (2) show them how to do it (instruct); and (3) tell them how close they came to doing it (give feedback). These three activities should be performed in certain ways. First, leaders should be CLEAR so that they will be understood. Second, leaders should be REASONABLE; even if people understand what they are told, they will not do it if they can not do it. Finally, leaders should be MOTIVATING. People may do the job if they understand it and can do it, but they will do it better if they want to do it. The model defines these concepts further to indicate that to be CLEAR, one must be CONCRETE, TIMELY, and CLARIFYING. Further, being CONCRETE means being SPECIFIC, PERFORMANCE ORIENTED, etc., down to the behavioral level of analysis.

The major concepts of this model are provided to the student early in instruction. This supplies a sort of conceptual map which tells the student what he will have to remember and gives a set of pegs on which he can hang more detailed information contained in the course materials. This model provides the type of pedagogical theories or memory storage organizers discussed by Hickey (1974) which enable learners to do with their minimal knowledge what experts do with their more extensive knowledge (including allowing the student to generate new propositions). The model also relates to Ausubel's (1960) notion of advanced organizers: "...that cognitive structure is hierarchically organized in terms of highly inclusive concepts under which are subsumed less inclusive subconcepts and informational data." Dansereau, et al (1974) noted that "...the learning of new meaningful material ought to be facilitated by insuring that the learner has inclusive concepts which will permit him to subsume the new information under these concepts..." and has cited several studies in confirmation of this.

This model is not complete in that some obvious gaps and overlaps are present in the format shown in Figure 1 and also good leaders obviously should perform functions and exhibit characteristics that are not represented here. The training program provided to CC's incorporates two such additional types of functions -- decision making and reinforcing -- which did not neatly fit into the model at this time.

Thus, the issue of the validity of the T.O.'s was approached by basing the T.O.'s on what is reported in the scientific literature in correspondence with what occurs in the job situation and what appears intuitively sound. The crucial check on validity, of course, is its predictive validity -- do good leaders actually conform to the model more than poor leaders and if we teach people to comply with the model, will this make them better leaders? Some answers to these questions are presented in a later section.

Another approach to the validity issue, taken by a second approach to T.O. development, was not to face it directly. Here, validity was redefined to be those behaviors and goals that the policy makers at the RTC designated to be valid. If the Commanding Officer and Military Training Officer indicated, for instance, that CC's should learn the names of every member of his company (behavior) or that a CC's success with "setbacks" is heavily weighted in his evaluation (goals), these became T.O.'s of the program. Note that this determination of T.O.'s was independent of any external criterion of validity. That is, decisions as to whether learning such things as the names of recruits or how the handling of setbacks is weighted in his evaluation will make any difference in the ultimate success of CC's were based simply on the opinions of personnel at the Command. (This is not to say that these opinions were necessarily less valid than the scientific literature employed in the other approach. The point is that the usual kinds of scientifically verified validity considerations were not a consideration here.)

The rationale for taking this approach, with its disregard for the usual kinds of validity concerns, was the finding that CC's differed from their superiors with respect to their notions concerning what behaviors they (the CC's) were expected to perform and how they were evaluated. A program that served to reduce these discrepancies should allow CC's to orient their behavior in accordance with a more accurate perception of system policy. It should also reduce the distrust and

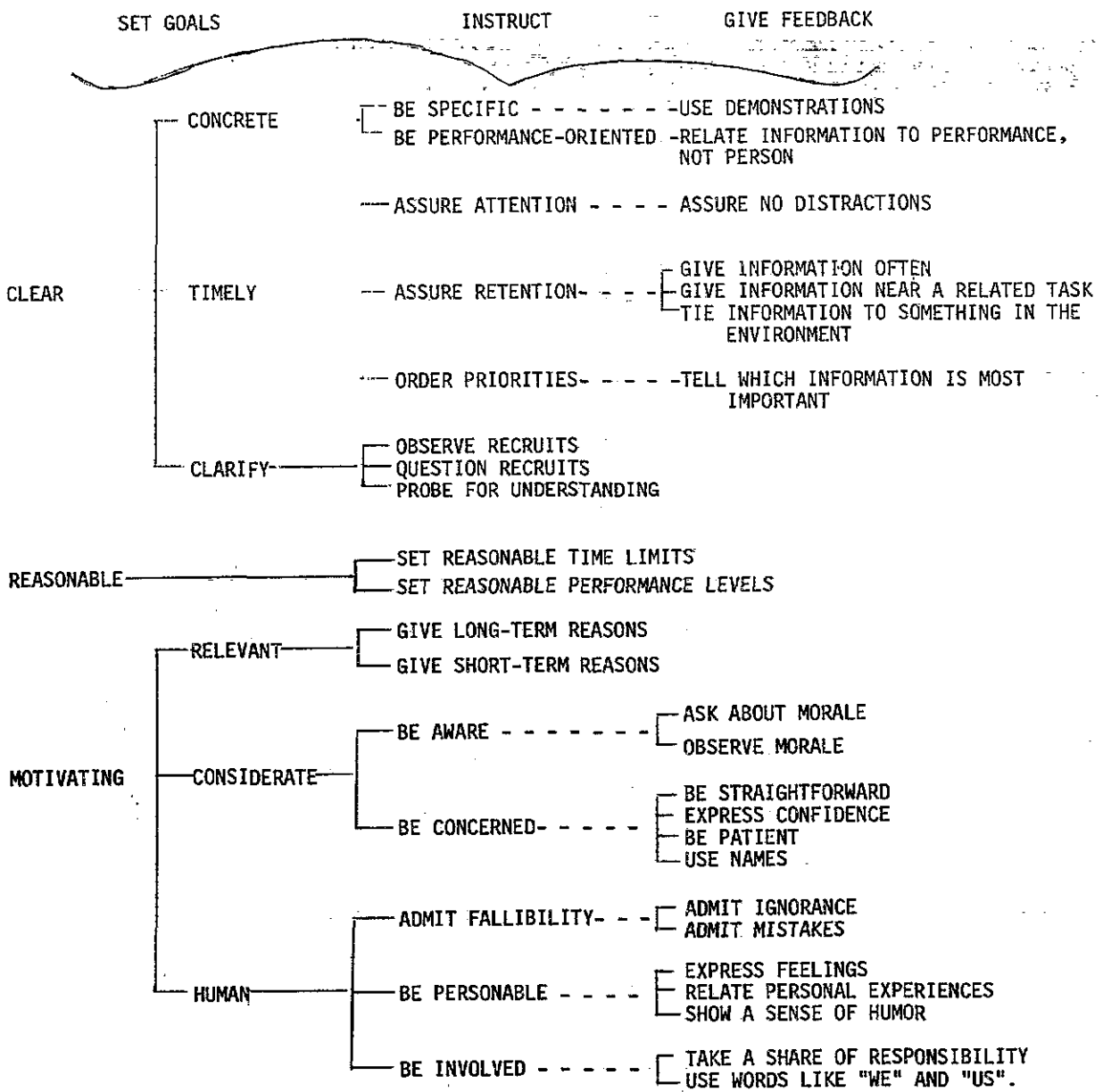

Figure 1. Model of Leadership

dissatisfaction with the evaluation procedure with consequent improvements in morale and, indirectly, in behavior.

LEARNING CONSIDERATIONS

The questionable transfer value of most social-skills instruction (noted in the foregoing) may be attributed to a variety of different factors, each of which must be considered if success is ever to be achieved. The second consideration in the interest of transfer value is that of learning. Given that the T.O.'s are worthy of being learned, what are the procedures and techniques that will maximize the chances that they will be learned? The question of how to get students to learn in the social skills area brings up a host of problems in addition to and/or having greater magnitude than counterpart problems characterizing man/machine areas, as follows:

A. Unlearning. Training programs that strive to change the manner in which a person wields social influence are faced with habit patterns developed over a lifetime of operating in social environments. These old habit patterns often conflict with new learning. When one comes to an awareness that he is conditioned to act in certain ways, he can start to operate aside from it.

B. Motivation. These old social habits create motivational as well as unlearning problems. The student often feels that he already has the skills being taught or that the course materials are no good and the skills he does have are just as good or better than those being taught. Such feelings in man/machine areas often can be readily dealt with simply by giving the student an opportunity to prove his skills on the job. He either can fix the carburetor or he can not. "Proving his skills on the job" is less straightforward in the social area. Consequences of leadership practices often are manifested over long periods of time and cause-effect relationships are difficult to establish in this area. Further, students usually have a pretty good idea about their level of skill relative to machines (at least for gross success/fail differences) without having to prove it to them. For social skills, on the other hand, it appears that many people are largely unaware of their deficiencies.

Additional motivational problems, more peculiar to the CC subject population, derive from the fact that most of the CC's did not volunteer for the job and often are not pleased with the assignment. Negative attitudes associated with displeasure with the job will surely lower interest in learning to do the job better.

Also contributing to the motivational problem is an apparent discrepancy in the priority of goals held by the CC's on the one hand and propounded by the training program on the other hand. The main goal suggested to CC's by the training program is to train recruits such that they will make good sailors on subsequent duty assignments. CC's believe they are evaluated primarily by the recruits' performance at the RTC. The CC's can meet the (to them) more imperative, relatively short-term goals, using strategies (e.g., extreme punishment) that are not consistent with the more general goals taken by the project. Thus, CC's may believe that they can reach some of their most critical goals (staying out of trouble, impressing their superiors, etc.) by rejecting certain portions of the training and resorting to skills they already have. It is difficult to convince a person that he should place a high priority on organizational goals when (at least from the CC's viewpoint) the reinforcement contingencies of the job place priorities on non-organizational and even contra-organizational goals. (CC's typically report the "best" company, in terms of training scores, often does not produce the best sailors. They feel that CC's have to resort to "politics" and "beating the system" to get outstanding ratings on their companies, whereas these things have nothing to do with the making of good sailors.)

C. Time Requirements. The same old habits of social influence that contribute to the unlearning and motivational difficulties in social instruction create special time problems. Less effective, but highly-mastered, old habits may be better than potentially very effective, but not as well-learned, new habits. (The student may feel that he will have to tolerate the possibility of unfavorable side effects from using, e.g., extreme punishment because at least it works for him to some degree.) Thus, social instruction has to be prolonged. New habits that the training proposes as replacement for the old habits must be sufficiently learned such that they can be at least equally effective with the old habits. Many social-skills training programs may fail simply because they do not allow enough time for this to happen.

D. Social Threat. Anxiety appears to be a common response to social situations. Anxiety responses to social situations are probably responsible for much of the apparent failure of people to learn to be more effective socially from their extensive experiences in actual social situations. Social-based anxiety restricts open responding and feedback and results in thwarted learning of social skills both in natural situations and in training environments. For example, due

to social anxiety many people would not think of telling an overbearing supervisor that his off-handed, disparaging remarks are demoralizing. Even if someone did tell him, the supervisor would likely consider the feedback as a personal attack and not very relevant to his job-related problems, anyway. With more technical tasks, there is considerably less reluctance by others to give feedback on what a mechanic, for example, is doing wrong. And cause/effect relationships being easier to establish, less resistance would be elicited on his part against using the feedback to modify his behavior.

Such are some major problems related to learning social skills. Following are some solutions taken to these problems in the training programs.

Several aspects of the computer-aided instruction (CAI) applied in this program provide new concepts for training in that they represent novel approaches for dealing with the special problems noted in the foregoing. For example, one program does multiple regression on the student's evaluations of "profiles" (i.e., records of hypothetical CC's performance) to determine his perception of system criteria for evaluating CC's. The regression analyses provide weights for factors entering into a student's evaluations which, in turn, is shown to the student to inform him of his own conception of how CC's are evaluated. Then, PLATO IV shows the student how his perceptions compare with the actual manner of evaluating CC's. This latter information was determined through use of the same "modeling" process as just described for use with CC's, only the actual evaluator of CC's judging the profiles in this case.

Thus, given what he thinks about the evaluation process and how this differs from reality, the student is then in a position to reconcile the two. Before this interaction with PLATO IV, the student was probably largely unaware of his own feelings about how his performance as a CC would be evaluated.

A second program falling under this same general approach strives to reconcile discrepancies between organizational conceptions of behaviors CC's should perform and students' conceptions of same. Accomplishment of this is attempted by allowing the student to: (1) indicate goals he has for himself at the RTC (e.g., stay out of trouble, turn out good sailors); (2) reveal his disposition as to whether he intends to perform each of 30 behaviors related to his work at the RTC. (These are behaviors selected from a larger list on which there was general agreement among RTC personnel that it is important for a CC either to perform or not to perform each behavior in question.); (3) relate each of his "behavioral intentions" to selected goals (i.e., he is asked if he thinks that performance of behavior X would increase or decrease his chances of attaining goal Y); (4) receive summary feedback on the feelings he just expressed which reveals whether, in general, he thinks performing each behavior will lead to more goals than not performing the behavior; (5) indicate his opinion as to the official organizational word about whether he should perform each behavior; (6) receive feedback on what the official word actually is regarding each behavior; (7) reconsider his "behavioral intention" (in the event his "behavioral intention" is discrepant with the official word) and indicate a change in light of the feedback he received and consideration of the organizational mission; and (8) receive feedback in summary form in which the 30 behaviors are listed under each of three categories to tell the student where he and the official organizational policy (a) always were in agreement; (b) once disagreed, but now agree; and (c) still disagree.

Thus, the problem that old habit patterns have to be unlearned is treated in these two programs by showing the student what his old habit tendencies are (via his perceptions of the evaluation system and of the behaviors he is expected to perform). Given an objective confrontation with his old habits and ideas, the student is in a better position to reconcile these in correspondence with the new information being presented.

These approaches also address the motivation problem in that one is less likely to feel that he already knows or does what is being taught if it is demonstrated to him that he has just responded otherwise. Further, a student is less likely to have the objection that "my way is better" since the arguments made are geared to convince him that more of his goals will be met if he performs according to the new information. Here, the processes of arguing with students via Computer-Aided Instruction (CAI) and doing regression analyses are not new concepts for training. However, the application of these processes to allow a student to identify his goals and behaviors and to trace relationships among the two does appear to be novel; as does their application to modeling and modifying a person's conceptions of how he is evaluated. Further, it would be quite difficult, if not practically impossible, to accomplish these functions without computer assistance.

Another novel approach taken that lent itself particularly well to the instruction of the present subject matter, via CAI, was to "personalize" the effects of instruction. Motivation to learn was to be improved by making the student the object of good and

poor leadership practices (as defined in this program) and relating these to his own feelings and performances that resulted. A student is less likely to think that some concept being taught is unimportant or untrue if the good and bad consequences resulting from its use or disuse can be experienced firsthand. For example, a game is presented in which feedback and goal setting is degraded and then improved and the frustrations encountered by the student while playing the game are related to those felt by recruits under similar conditions.

Another example of "personalizing instructional effects" is provided in the "attitude checks" taken throughout training. Information derived from these attitude checks are taken into account in a general performance report given to the student near the end of training. One of the concepts being taught -- BEING CONSIDERATE -- consists of being aware of morale and being concerned about the recruits (see Table 1). The program shows how this concept is implemented in that the attitude checks are efforts to be AWARE of the student's morale and the manner this information is used in the performance report shows CONCERN. The computer has unique capabilities for collecting and processing this information on each student and treating each student differently in the performance report based on his own performance record, state-of-morale, and attitudes.

The attitude checks and performance reports mentioned in the foregoing refer, in part, to the results of student's encounters with problem situations typical of his job. These problems consist of descriptions of social situations he is likely to encounter on his job along with alternative responses commonly made by CC's to these situations. The student tries to choose the response that best represents the concept being taught. He is provided feedback concerning whether and why he is correct or incorrect. The feedback is tailored to the particular response selected. In current modifications to the program this feedback is being tailored also to individual students to: (a) reflect types of errors the student has committed on previous problems; (b) present the feedback in the form of a back and forth dialogue between the student and simulated recruits so as to demonstrate (rather than merely describe) the probable consequences of employing responses selected by a student. Many complex operations involved in providing this sort of feedback capitalize upon the capabilities of a computer.

Related to this problem situation approach is the use of "case studies." Now under development, case studies would enable the trainee to engage in realistic situations which develop in direct response to his queries and decisions. A number of viewpoints and personalities would be incorporated in such a simulation. In settling a grievance, for example, the trainee would be able to speak with and question (by selecting from a menu of responses) each of the several parties and witnesses involved and to interact with superior officers. Like the feedback used for the problem situations, improper handling of the case might, for example, cause further difficulties among the recruits. The case study, however, is richer than the feedback for the problem situations in that the former provides a larger number of courses of action that the student can take and responses the computer can return at any given point in time and the interaction is extended over a longer period of time. The case study approach comes the closest to simulating critical aspects of the job situation without involving other people in the interaction.

Special contributions made by the problem situation and case study formats are that they require the student to demonstrate his ability to use the concepts of the lessons, rather than merely define them. Further, these formats provide a degree of drill and practice so as to develop social habits rather than merely to acquire cognitive information. An effort is being made to include sufficient amounts and types of practice such that the habits will be the "natural" response for the student in similar situations on the job. Most instruction for social skills provide no technology to meet these objectives.

The "problem situations" portion of the training is based on the model of leadership. Each of seven lessons deals with a different second-order concept from the leadership model (from CONCRETE to HUMAN). Each of these seven concepts is addressed, in turn, with problem situations relating each concept to the major tasks of SETTING GOALS, INSTRUCTING, and GIVING FEEDBACK.

The problem situation and case study approaches provide types of exercise that are needed for students to "unlearn" inappropriate habits and to acquire more appropriate new habits. They offer relatively non-threatening situations which reduce anxiety and permit open responding and feedback. The student can try out different methods for giving orders, etc., and decide for himself, in such safe environments, which ways are best. His motivation to learn is improved because the life-like reactions to the student's inputs provided by the computer are compelling types of evidence regarding the appropriateness of the student's responses.

The previously mentioned features of the program, except where noted, have been developed as described and subjected to field tests in experimental evaluations. The video tape characteristics of the program described in the following are in the process of being developed at the time of this writing. These latter capabilities will be introduced (along with other new capabilities not mentioned here) in field evaluations of the entire program in the next year.

A new concept for teaching social skills is represented by the use of a video tape in conjunction with CAI. Here, self- and other-evaluated video tape recordings of actual, on-the-job encounters between CC's and recruits are implemented and processed; also feedback on evaluations is provided to the student keyed with video tape playback; and remediation is recommended, all via computer control.

Each student brings into the training situation one or more recruits with whom they are having some particularly difficult interpersonal problem. The CC's interaction with these recruits is recorded on video tape, which is initiated and terminated by the CC pressing a key on the computer terminal. The student initiates a self-evaluation of his taped performance by touching the points on various dimensions appearing on the terminal screen which best describe the interaction at given points in the taping. The major criteria are whether the CC is being CLEAR, REASONABLE and MOTIVATING as defined in the most general categories in the model of leadership. Thus, as the evaluator views the video tape, he rates the CC's performance by indicating at frequent intervals the extent to which he thinks he would understand what the CC is trying to say, whether he would want to do what the CC is requesting, and whether he would be able to do what he is saying. The computer averages the durations of the moment-to-moment evaluations for a summary evaluation in each category and recommends remediations to the training materials where his evaluations are low.

The CC can retry video tape sessions with a variety of situations until he is satisfied with his performance at which point he submits the tape for evaluation by others. These "other" evaluations are performed in the same way as the self-evaluations. The summary evaluations of a given activity in the taping are keyed by the computer to the portion of the taping where the activity occurred. Thus, when reviewing the tape recording, the various evaluations of his performance appear on the terminal screen at the points indicated by the evaluators. (This procedure is similar to that suggested by Vriend [ref. cit.].) Some of these evaluations are done with categories at the lower levels (in the leadership model). Thus, if a student comes out low on being CLEAR, his tape is subjected to a finer level evaluation to determine whether he is not being understood because he is not being CONCRETE, TIMELY or CLARIFYING. These evaluations can be performed at even finer levels of evaluation until the behavioral level is reached. The student keeps on taking remedial instruction and trying on video tape until he is judged acceptable on all criteria by himself, his peers, and trained, "expert" judges.

The special contributions made by the computer to this training are: (1) to assist in the process of evaluating taped performances by averaging the moment-by-moment evaluations for the judge (instead of requiring him to do this for himself to arrive at one global evaluation at the end of a relatively long session); (2) keying the evaluations to the specific acts being evaluated on the video tape, thusly allowing presentation of the evaluations at appropriate points in the playback of the taping; (3) compiling, summarizing, and providing feedback on these evaluations as made by different people; (4) recommending and implementing remedial training to the student based on the evaluations.

These techniques for using the computer in conjunction with video tape for providing evaluation and feedback about interpersonal behavior, for the most part, appear to be new concepts for training systems. The problem of unlearning is dealt with via the video tape techniques in that the student can readily see how his old habits operate in his taped performance. These perceptions are emphasized by the self- and other-evaluations, both in summary forms as well as the detailed moment-by-moment descriptions. Motivation to learn is improved because the student can see that he does not already exhibit the behaviors being taught and that the behaviors he does exhibit are not effective from several points of view and from the view of several people. He can also see that the new behavior he has acquired (via remediation or as a more direct result of the feedback from the evaluations) is judged more effective. This opportunity to see oneself actually perform and to get instruction on how to improve performance and then to repeat the whole process until performance is acceptable should be a valuable learning experience. Many complex details of record keeping, data processing, presentation of feedback information and remediation which are accomplished quite readily by the computer would be extremely difficult if not impossible to do by hand.

The individual difference problem with social-skills training -- that everyone does it different and many ways can work -- is handled nicely with the video tape training in that a student will not receive training unless his own way of doing things is judged not to be working (i.e., people don't understand him, etc.).

Finally, the social-threat deterrents to learning, surrounding most situations in which people-to-people problems are being dealt with, can be alleviated by the anonymity of the computer. Discussions of the best ways to deal with social situations, practice in the way of actual attempts to influence people socially, and evaluations of such attempts are all less threatening when mediated by a computer. The computer can take the student gradually from situations of little threat (e.g., interaction only with the computer) to those of greater social stress (e.g., role playing and on-the-job instruction) in preparing the student for the conditions of his leadership role.

III. TRANSFER SITUATION CONSIDERATIONS. Proper consideration given to training objectives and instructional strategies will result in training materials that students should, can, and will learn. Even given that the student does learn the materials and that the materials he learns are valid, the whole training effort still will be for naught if the student chooses not to apply his newly acquired skills on the job. Certain aspects of the transfer situation are influential in determining whether he makes this choice in a favorable or unfavorable direction.

Reinforcement contingencies in transfer situations, for one critical example, often are not supportive of learned social behavior. If the newly learned social behaviors are to survive they need positive reinforcement. Such reinforcement is not to be forthcoming from many organizations that place highest values on nonsocial concerns such as paperwork and politics. Discrepancies within an organization concerning the conceptions of which behaviors and goals are or are not appropriate create a situation in which subordinates are not rewarded and supervisors do not get the performance they want from their workers and neither knows why. Also, some naturally occurring reinforcers are more immediate and consequently more powerful for some less desirable behaviors (e.g., punishing poor performance) than for more desirable, newly-learned behaviors (e.g., rewarding good behavior).

Some factors entering into the consideration of whether the T.O.'s are of any value and whether they will be learned have been considered. As for the question of factors influencing whether the T.O.'s (given that they are valid and learned) will be used, the current training program addresses this problem in the evaluation and behavioral programs that strive to reconcile discrepancies between the student and his superiors. Once CC's are performing the behaviors and seeking the goals considered appropriate by their superiors, reinforcements from the superiors should support and perpetuate the behaviors in question. More can be done in this area by indoctrinating more of the superiors of CC's in the skills programs and by obtaining their cooperation in employing some of the techniques used to evaluate the training programs in this study (to be discussed in the next section) in their own evaluations of the CC's.

EVALUATION OF THE NEW TRAINING CONCEPTS

Results from a first pilot evaluation of a training program based on an earlier version of the leadership model showed that CC's did learn the T.O.'s of the lesson and did apply them in their interactions with recruits. Evidence for this came from a questionnaire given to half of the recruits in the companies of six CC's who served as experimental subjects and six CC's who served as controls. Experimental CC's each received approximately three and one-half hours of instruction on the model and a total of one-half hour for pretest and posttests. Control subjects received the same pretest and posttest conditions (on PLATO IV) as the experimental subjects, but none of the three and one-half hours of intervening instruction. The questionnaire was administered twice during the nine-week training period -- once at the end of the first week of training (S1), and again during the seventh week (S2). Figure 2 shows that experimental CC's were generally superior ($p < .05$) to the controls on S1. This difference was maintained on S2, albeit at a nonsignificant level. This suggests that the training was effective in producing the desired behaviors on-the-job, but was not strong enough to maintain them over several weeks of performance. This tendency to revert to other behaviors may indicate a need for more training and/or more support for the behaviors from the RTC. On the other hand, this depression of the trained behaviors may be just a natural and temporary effort on the part of the CC's to try out some other strategies for dealing with the recruits. In this case, many of the behaviors taught would be expected to return after alternative strategies are tried and discarded.

Additional support for the effectiveness of the training program derives from the fact that the one experimental subject (E1) who scored below the controls was one of the two experimental subjects (E6 was the other) whose

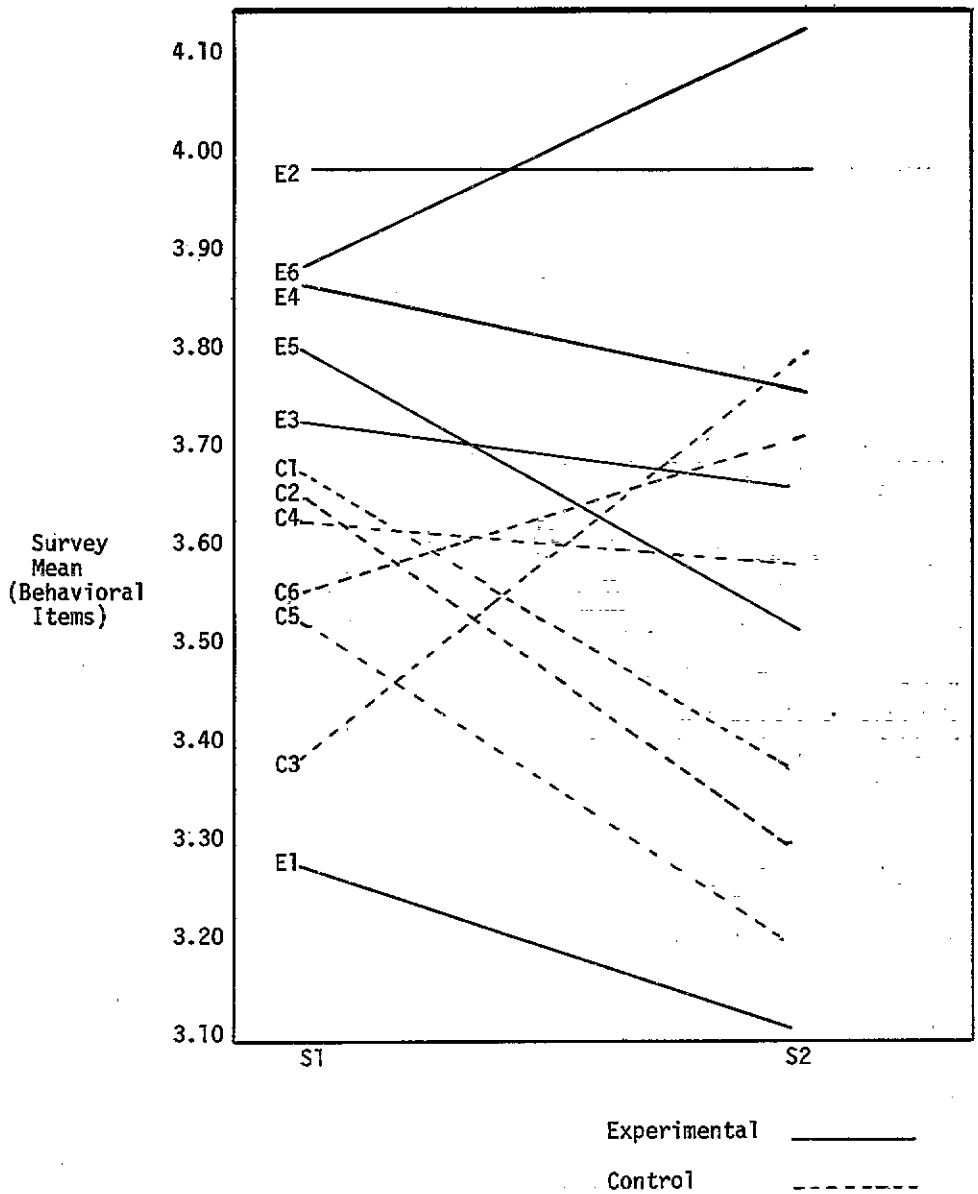

Figure 2. On-The-Job Performance As Measured On Two Administrations of the Survey

pretest/posttest score did not improve. If the training is effective, one would expect poorer transfer performance from students who performed at a relatively low level in training and showed no improvement overall -- and this is what occurred with Student E1. The other student who failed to improve between the pretest and posttest was relatively high on the training scores and both the pretest and the posttest measures. This suggests that he was rather proficient in the skills being taught even before training, which accounts for the fact that his transfer scores were high in spite of his lack of improvement on the posttest.

This positive relationship between training and transfer performance discussed in the foregoing for two experimental subjects was obtained for all experimental subjects in the form of a significant correlation between the training score and S2 ($r = .82$, $p < .05$). A similar relationship also was obtained for experimental and control subjects between the posttest score and a subset of S1 consisting of items on which experimental and control subjects were significantly different ($r = .61$, $p < .05$). Thus, training was predictive and apparently a major source of behaviors performed on-the-job.

Preliminary evidence that the behaviors being taught are important (i.e., valid) is derived from the fact that CC's who were "more successful naturally" (i.e., CC's who did not receive this training program but still were ranked high by their supervisors and recruits) exhibited the behaviors taught in the training program to a greater extent than "less successful" CC's. This data was collected on only three CC's (one exceptionally good, one average and one poor), but the trend is suggestive that CC's who have the skills defined by the leadership model apparently are more effective than those who do not. Although this sort of data does not necessarily indicate that CC's will become more effective if they would learn and use these skills, such data certainly do lend support to such a notion.

The leadership model was expanded and revised to its current form (see Figure 1) and a training program based on this new model was subjected to an experimental evaluation. Results from this research are being collected at this time. The experimental design was similar to that of the earlier study, only approximately seven hours of training (vice 3-1/2 hours) were provided to the experimental group. Some preliminary observations from this research suggest that just a brief exposure to the training situation may favorably influence CC performance. In the three months (April - July 1975) since the first of the 27 experimental and control CC's took lead of a company, only one CC (from these 27) has lost his company due to performance problems. In this same time period, fourteen CC's who were not given any exposure to PLATO IV also received their first company. Six of these fourteen CC's lost their companies due to poor performance. This trend (one out of 27 vs. six out of fourteen) provides quite relevant support for value of the PLATO IV experiences they received. The fact that experimental and control subjects did not noticeably differ from each other (one out of the fourteen experimentals and zero out of the thirteen controls lost companies) may be attributed to the operation of a Hawthorne-like effect. Experimental and control CC's have been observed to discuss their PLATO IV-related experiences among themselves and some competitive spirit seems to evolve when control subjects realize they receive only a small portion of the program materials. Further, the pretest and posttest provided to the control CC's might have oriented these subjects to attend to the sorts of behaviors being taught. Thusly sensitized, control subjects might be motivated to seek out further information from the experimental CC's and from questionnaires given to recruits. These questionnaires are quite comprehensive and explicit about the behaviors that are to be observed in the CC's and the effects CC's may have on the companies. The heightened motivation to compete along with information derived from various sources regarding the content and expected effects of the training materials, in combination, could have given control subjects the observed edge over the other first-time CC's.

These findings are encouraging to the idea that the training was effective, but the data still must be treated cautiously. The sample of CC's should be larger and their study should be extended over longer periods of time. Also, effects of the training on other measures of success should be assessed. These two needs are being pursued at this time.

A first evaluation of the "behavioral" and "goals" training programs implemented in the second approach taken in this effort is also now underway.

CONTRIBUTIONS OF THE TRAINING PROGRAM

This project should provide training to improve the socially-related behaviors of the student CC's in their interactions with recruits as well as in subsequent duty assignments. People interacting with the students should benefit in the ways of more complete understanding and higher motivation concerning activities influenced by the students. With respect to recruits, this improvement

should be shown in the way of better attitudes and morale, longer retention, increased productivity, and faster learning. Introduction of the training to other job areas where social behaviors are critical should be made relatively easy by this effort and similar advantages should result therefrom.

The training resulting from this project could be integrated into the current CC training program either at the RTC's or at the Instructor Schools attended by CC's immediately prior to arriving at the RTC's. The instruction is designed to be self-instructional, thus a monitor would be required only for scheduling the students and assisting with unpredictable contingencies (e.g., a student who has trouble operating some aspect of the equipment). With additional research and development work, the concept might be extended to more components of the CC's job as well as to other jobs requiring high-level social performance.

The impact of this training should be widespread as it should provide the Navy with personnel (the recruits) who are highly motivated and well oriented for the role of serving the Navy. It should also provide better leaders in those trained by the programs and, through example, in those influenced by the students. Considering the diverse roles played by these people in the Navy and the subtle ways that motivation and leadership qualities operate, it is impossible to estimate military resources saved -- but it should be great.

This project can supply information on PLATO IV technology to anyone who may want to use CAI. Also, the training materials can be used, practically as is, to train personnel who interact with recruits in any of the military services. With minor modifications, the training can be used to train anyone in a leadership role. With somewhat more changes, the programs can provide structure to design training for social behaviors required for any job. New CAI techniques developed and utilized in this project can be employed in all types of training and for all sorts of job/skill areas.

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ABOUT THE AUTHORS

DR. ARTHUR S. BLAIWES is a Research Psychologist in the Human Factors Laboratory at the Naval Training Equipment Center. He received a B.S. from Ohio State University and an M.A. and Ph.D. from University of Kentucky in Experimental Psychology. He is currently engaged in research and development programs dealing with leadership instruction and computer-based instruction. He has published and presented a number of papers on training. He is a member of the Institute of Electrical and Electronic Engineers and the Human Factors Society.

MR. DENNIS R. WELLER is a Psychologist in the Human Factors Laboratory at the Naval Training Equipment Center. He received a B.E. degree in Mechanical Engineering from Vanderbilt and an M.S. degree in Industrial Psychology from Florida Technological University. He is currently doing research on computer-assisted instruction as applied to leadership training. He previously worked as a design engineer in the Aerospace Industry.