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EFFECTS OF STIMULUS VARIABILITY ON TRAINEE OUTCOMES: ENHANCING BEHAVIOR MODELING TRAINING

By

Timothy Todd Baldwin

A DISSERTATION

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ABSTRACT

EFFECTS OF STIMULUS VARIABILITY ON TRAINEE OUTCOMES: ENHANCING BEHAVIOR MODELING TRAINING

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The research presented here was designed to empirically investigate an application of basic learning theory to modern industrial training practice. It was an investigation of the effects of increasing the variability of learning stimuli on the effectiveness of behavior modeling training.

72 trainees participated in a behavior modeling program on assertive communication and were randomly assigned to one of four training conditions. The conditions differed only in the variability of the modeling stimuli to which trainees were exposed. Variability of the modeling stimuli was manipulated in two ways: (1) scenario variability, whereby the training models effectively depicted assertive behavior in one or more different assertive scenarios; and (2) model competence variability, whereby the training models depicted assertive behavior in an effective manner only, or both effectively and ineffectively.

Dependent variables were five trainee outcomes which included trainees' reaction to the program, an objective

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paper and pencil assessment of learning, and three behavioral measures evaluating trainees' ability to reproduce, generalize and transfer trained assertiveness skills.

Results of multiple regression analysis indicated that increased variability in modeling was not associated with trainee reaction to the training or paper and pencil learning, but was negatively associated with reproduction and positively associated with transfer. Increased variability in modeling was not associated with generalization. Further analyses revealed that, relative to those conditions with positive modeling only, the inclusion of negative modeling, in conjunction with positive modelings, was negatively associated with reproduction but positively associated with trainee transfer.

Based on the findings of this study it was suggested that the conventional wisdom of using low variability and strictly positive stimuli in training contexts should be reconsidered. The value of negative modeling and non-exemplary information, demonstrated here, clearly warrants further conceptual and empirical work. In addition, the inverse relationship found here between trainee reproduction and transfer, confirms the importance of training designers linking their evaluation criteria with training objectives. Finally, limitations of the present

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study are identified and future research directions proposed.

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DEDICATION

This dissertation is dedicated in loving appreciation to Mom, Pop and JoEllen, the three most positive behavior models I know.

ACKNOWLEDGEMENTS

Undoubtedly the most accurate line in the 1987 MSU Management Department Doctoral Student Manual reads, "nobody does a dissertation alone." Indeed, there is no way I could have completed this long, frustrating, tedious, exciting and thoroughly painful project without the help of many people. A few of those people warrant special acknowledgement here.

To my chairman, Ken Wexley, who first excited me about getting a Ph.D., helped me get in to the program, taught me, worked with me, and finally helped me get a great job. He was (and is) a mentor, colleague and friend.

To my committeee members and friends, Kevin Ford and John Hollenbeck, whose professional standards, high expectations and creative ideas improved this dissertation enormously.

To my raters, Rick Malacrea and Kathy Karl, who although "blind", still produced wonderful interrater reliability.

To Scott Snell, who served as a behavior model in this study, which was fitting, because Scott is the sort of unique person who deserves to be modeled. My memories of four years in the Ph.D. program are completely dominated by the great times Scott and I had at Dooley's, the Shark, the

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Health Club, the Derby, my wedding and the countless number of laughs we had just sitting around in the department fixing the world.

To Mom & Pop, whose unwavering support, both emotional and financial, has always been beyond compare. Suffice to say that when I hear friends say that their goal is to "give their children something more than their parents gave them", I know that, for me, that's an impossible task.

To my brother Scott, who so sagely told me when I was wavering between entering the Ph.D. program and taking a considerably more lucrative job in Chicago, "if I was you, I'd get the Ph.D." His positive influence there, and in many other ways, is more than he could know.

To my brother Tyler, who was the other behavior model in this study and also rightly deserves to be modeled. Tyler moved in with me during my last year in the program and I am indebted to him for talking me out of bagging the whole thing during one particularly low moment. His presence during that last year reminded me that there is nobody with whom I laugh harder, than with Ty.

And finally, but most deservedly, to my wife and partner JoEllen. Jo's love, patience and support through this whole thing were something to behold. She worked so hard, sacrificed so much, and helped me so greatly that she is quite fond of saying that it is not solely my Ph.D., but <u>our</u> Ph.D. And so it is.

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Chapter I

INTRODUCTION

Statement of Problem

Training programs in industry are based on the belief that it is possible to design an environment in which learning can take place and later be transferred to another setting (Decker, 1979; Goldstein, 1974). Hence, it is not surprising that the primary theoretical basis for industrial training is a variety of learning and transfer "principles" which have been developed and refined primarily by researchers in the areas of learning and educational psychology (for a discussion and summary of these principles see, Campbell, Dunnette, Lawler, & Weick, 1970; Decker & Nathan, 1985; Ellis, 1965; McGehee & Thayer, 1961; Schneier, 1986). Such principles are what are most often discussed by those who try to apply learning theory and knowledge to organizational training contexts (Bass & Vaughan, 1966; Goldstein, 1986; Goldstein & Musicante, 1985). Despite widespread recognition and acceptance of findings and principles generated from learning research, however, training authors have consistently lamented that minimal reliance has been placed on this body of literature in the development, implementation and modification of industrial

training programs (Campbell, 1971; McGehee & Thayer, 1961; Goldstein, 1974; Hinrichs, 1976; Wexley, 1984).

Part of the problem may be traced to the fact that learning theorists have typically focused on immediate learning, in highly specific and controlled laboratory settings, making generalization to field settings difficult (Gagne, 1962; Decker, 1979). Furthermore, learning researchers have tended to ignore areas of complex human behavior such as social and supervisory skills (Goldstein, 1986). Consequently, the issues of generalization and transfer of management and social-skill learning to different contexts, the paramount concern of industrial trainers, has not received much basic research attention. There is clearly a need to integrate basic learning theory and findings, and issues of learning and transfer in industrial training.

Intent of Study

The research presented here was undertaken to make a contribution towards such an integration of basic learning theory and modern training practice. It is an investigation of the effects of increasing the variability of learning stimuli, a principle drawn from basic learning research for enhancing trainee generalization of learning (e.g., Ellis, 1965; Goldstein & Kanfer, 1979; Kazdin, 1975), on the effectiveness of behavior modeling training. Behavior modeling is a popular instructional methodology used in

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industry for supervisory and social skill development. It consists of four components: modeling, retention processes, behavioral rehearsal and social reinforcement and has been proclaimed to be among the most theoretically sound and empirically supported training methodologies used in industrial contexts (Goldstein & Sorcher, 1974; Decker & Nathan, 1985; Rus-Eft & Zenger, 1985). Unfortunately, after a splurge of interest surrounding the development of behavior modeling in the 1970's, empirical research on the technique has seriously waned in the last few years (Rus-Eft & Zenger, 1985). Some research has been carried out to evaluate particular programs (e.g., Meyer & Raich, 1983) but with the exception of the work of Decker and colleagues on various types of learning points (1980, 1982, 1984), little in the scientific literature has been reported on attempts to improve or enhance the behavior modeling components. The modeling component, in particular, has been ignored as a target for improvement. Several studies evaluating the behavior modeling components (McFall & Twentyman, 1973; Stone & Vance, 1976) have indicated that the modeling stimulus may be the weakest component of the process. Others have suggested that the relative weakness of the modeling component may be due in part to the use of simple, redundant and unrealistic video models (Parry & Reich, 1984). Put in terms of the learning theorist, existing modeling programs could be characterized as typically having

a relatively low degree of variability in the modeling stimuli presented to trainees.

The present study was designed to comparatively investigate the effects of alternative modeling designs that incoporate increased variability of stimuli presented to trainees. It was expected that incorporating more variability would strengthen the modeling component and the behavior modeling technique overall.

Overview of Chapter

As a background to this investigation, the theory and practice of the behavior modeling learning approach is first described and empirical work examining the effectiveness of the approach is reviewed and critiqued. Research investigating the relative contribution of the modeling component to the overall behavior modeling process is also reviewed. The next section identifies two criteria issues relevant to behavior modeling: (1) the distinction between reproduction, generalization and transfer of learning; and (2) the importance of considering desired learning outcomes as a contingency in the design and evaluation of modeling-based training. The following two sections introduce the learning principle of stimulus variability and discuss its link to the enhancement of behavior modeling. Alternatives for operationalizing variability into existing modeling practice are then discussed and a counter argument against increasing variability in behavior modeling is identified

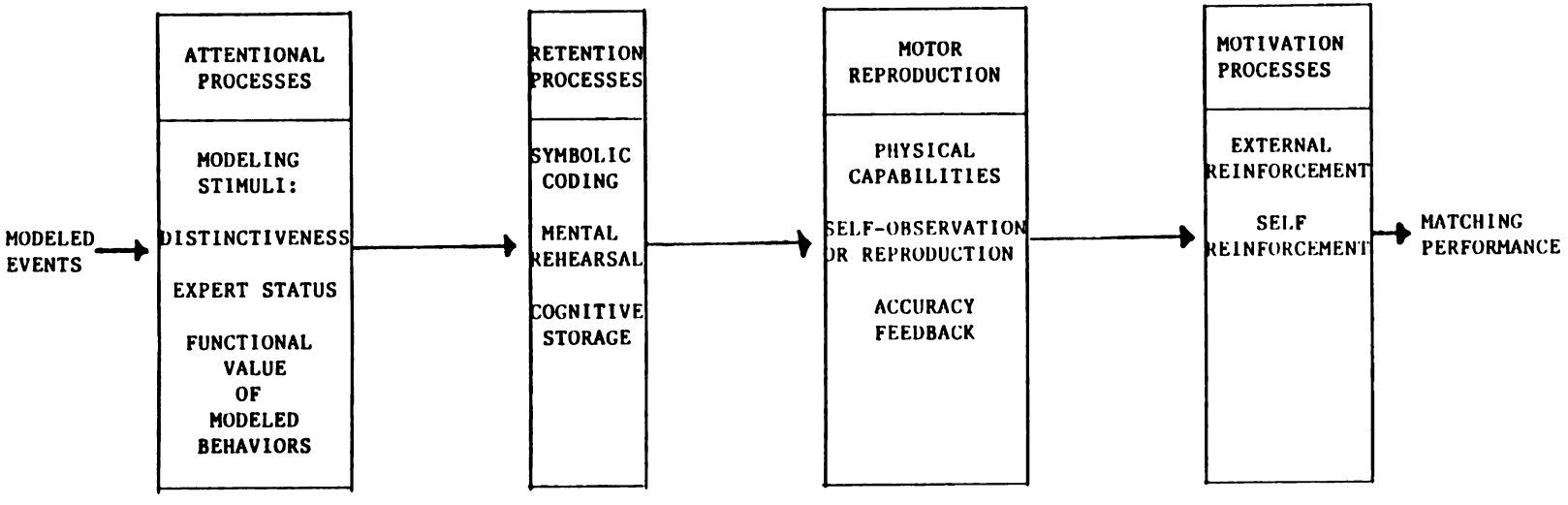
and critiqued. The chapter concludes with a description of dependent measures, presentation of research hypotheses, and a brief summary.

Social Learning Theory

The theoretical foundation of behavior modeling training is Albert Bandura's social learning theory, which suggests that observational learning is a multiprocess phenomenon encompassing attentional, retentional, reproductional and motivational processes (Bandura, 1969, 1977). A model of these component processes is presented in Figure 1-1.

Attentional processes determine what is selectively observed in the variety of environmental events to which individuals are constantly exposed and also what is extracted from such exposure. According to Bandura (1977), factors involved in the attentional processes include a number of characteristics of the modeling stimuli. For example, people we regularly associate with are readily observed. Also, those who are considered experts, or have elevated status, or are simply people who usually succeed in obtaining positive consequences for their actions, are all likely to receive greater attention. Such people stand out from the crowd and their actions are perceived to result in some desired outcome, which also has value, or valence, to the observer (Bandura, 1977; Decker & Nathan, 1985).

FIGURE 1-1



PROCESSES OF SOCIAL LEARNING THEORY
(Adapted from Bandura, A. 1977)

Retentional processes are equal in importance to attentional processes in that people cannot be influenced by observed behavior they do not remember. The first step in the retention process is known as symbolic coding. Symbolic coding describes a process whereby observers code the observed behaviors into their own words or symbols (codes) which are easier to store and retrieve. The observer then mentally rehearses the codes in order to store them in long-term memory. According to Bandura (1977), once the observer has attended to the model, stored what has been observed and rehearsed it mentally so that it has been retained in long-term memory, cognitive learning has occurred.

Reproductional processes involve trying out the behaviors to see if they lead to the same reinforcement that was obtained by the model. The amount of observational learning that will be exhibited depends upon the extent to which the observer has cognitively learned each element or step required to rehearse a sequence of behaviors. Since ideas are rarely transformed into correct responses on the first attempt, accurate matches are usually achieved by corrective adjustments in practice. Discrepancies between a symbolic representation and execution of the modeled behavior provides cues for corrective action. Therefore, a person observes his or her own reproduction to gain accuracy feedback in order to fine-tune his/her motor reproduction of the modeled behaviors.

Finally, motivational processes recognize that people do not enact everything they learn. They are more likely to adopt a modeled behavior if it results in valued outcomes. Once a person has learned and reproduced the observed performance, that performance will lead to external and/or self-imposed consequences. If these consequences are positive, the behavior will be maintained and used in the future. In summary, in order for people to learn from a model, they must observe what the model is doing, remember what the model did, do what the model has done and later, in the appropriate environment, want to use what they have learned. Therefore, in any given instance, the failure of an observer to match the behavior of a model may result from any of the following: not observing the relevant activities: inadequate retention of events; lack of reproduction attempts, lack of reproduction accuracy feedback or lack of reinforcement for behaviors used. Conversely, increases in the effectiveness of observational learning will only be enacted to the extent that one or more of these component processes is enhanced. The focus of this study is on characteristics of the modeling stimuli that will enhance observational learning.

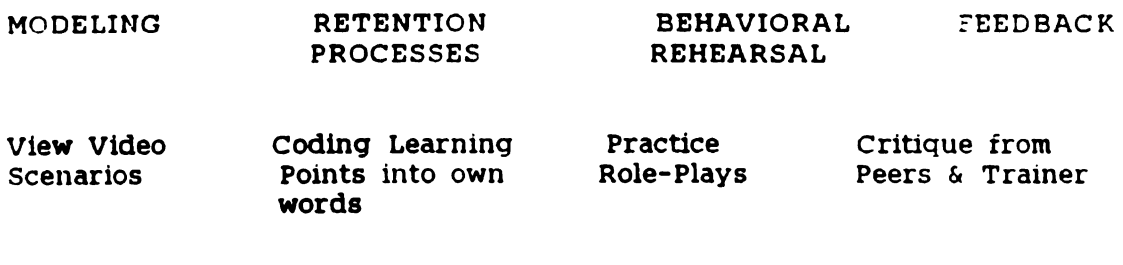
Behavior Modeling Training

Behavior modeling training was originally described for industrial purposes in a book by Goldstein and Sorcher (1974), and the basic training model has remained relatively

unchanged since that time. The processes of social learning theory are incorporated into behavior modeling through a sequence of behavioral learning activities. A model of these activities is presented in Figure 1-2. The four activities in a behavior modeling program are: (1) modeling, in which individuals or groups of trainees watch filmed video scenarios depicting models acting out the behavior or set of behaviors which one wishes them to learn; (2) retention processes, in which trainees go through a series of formalized activities designed to help them retain what they saw in the modeling display; (3) behavioral rehearsal, in which trainees take part in practice and rehearsal of the specific key behaviors demonstrated by the models; (4) feedback, in which praise or constructive feedback is provided by both the trainers and other trainees (Decker & Nathan, 1985). In recent years, behavior modeling training has received increasing attention in industrial and academic circles. Thousands of industrial organizations now use some type of behavior modeling for the training of interpersonal and supervisory skills and it has been estimated that hundreds of millions of dollars are spent on modeling-based training and development activities each year (Huber, 1985; Robinson, 1980). Practicing managers and trainers favor the technique because, unlike traditional lecture and group seminar training formats, modeling is very behaviorally focused and intuitively appealing to both

Figure 1-2
Modeling Training

Figure 1-2
Components of Behavior Modeling Training



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Academic interest in behavior modeling is reflected in a growing body of evaluation studies and the recent appearance of several scholarly reviews and books on the topic (e.g., Decker & Nathan, 1985; Fox, 1985; Russell & Mayer, 1985). In the academic community, behavior modeling is often extolled as a superior training technique because of its strong theoretical foundation and its direct and persistent focus on behavior change rather than attitudinal change. Moreover, behavior modeling does incorporate several traditional learning principles, such as identical elements and overlearning, and also addresses a suggestion of Gagne (1962) that it is necessary to organize the performance to be trained into a set of distinct components.

Effectiveness of Behavior Modeling

Research evidence from a number of studies supports the utility of the behavior modeling technique in teaching manual and interpersonal skills in industrial settings (Birkenbach, Kamfer, & Morshuizen, 1985; Burnaska, 1976; Byham, Adams, & Kiggins, 1976; Latham & Saari, 1979; Meyer & Raich, 1983; Moses & Ritchie, 1976; Porras & Anderson, 1981; Smith, 1976). Other studies, in non-industrial settings, have investigated the effectiveness of training methods including the behavior modeling components (Cooker &

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Cherchia, 1976; Curran & Gilbert, 1975; Malec, Park & Watkins, 1976; McFall & Twentyman, 1973; Stone & Vance, 1976; Wolfe & Fodor, 1977). Each of these reports has shown superior results for behavior modeling techniques over control conditions or alternate training designs. Research evidence also exists justifying the place of each of the components in behavior modeling (for reviews, see Goldstein & Sorcher, 1974; Twentyman & Zimering, 1979). For example, Spool (1978), presented reports of training programs for performance raters and discussed several studies which lacked one or more components of behavior modeling. All were less effective than programs containing all the components. Similarly, Stone and Vance (1976) compared training procedures containing modeling, role play plus social reinforcement, instructions, and all possible combinations in attempts to increase written empathic communication of college students. Results indicated all components together were superior to any alone or partial combinations. While the support for behavior modeling is seemingly widespread, two important criteria issues are often overlooked in the evaluation literature. These issues are discussed below.

Criteria Issues

Several authors have suggested that the evidence cited earlier in support of the behavior modeling technique is still far from overwhelming (McGehee & Tullar, 1978; Parry &

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Reich, 1984; Robinson, 1980). While the fundamental precepts of the behavior modeling technique have not been questioned, these authors have argued that there are enough inconclusive results and untested assumptions, particularly with regard to trainee ability to generalize modeled learning and transfer it to on-the-job settings, to make complacency with the existing process ill-advised (e.g., Parry & Reich, 1984; Russell, Wexley, & Hunter, 1984; Robinson, 1980). In fact, a recent review and meta-analysis by Russell and Mayer (1985) found that the majority of empirical studies evaluating behavior modeling relied heavily on trainee reactions and paper and pencil learning criteria. At best, the ultimate criterion used in existing studies often required trainees to reproduce essentially the same behavior they saw modeled in a role play. Only a very limited number of studies have collected data on criteria of generalization and transfer. In some applications of modeling training, perceptual and reproduction data may be entirely sufficient as evaluation criteria. However, it is argued here that, at least in the case of most of the behavior modeling done in industry, such criteria are clearly not sufficient. This issue is discussed in the following section.

Reproduction, Generalization and Transfer

The paramount objective of almost all training done in industry is usually stated as "positive transfer"

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(Goldstein, 1986). However, positive transfer is a frequently misunderstood expression which warrants some clarification in this context. Conceptually, there are three types or stages of behavioral outcomes from training; reproduction, generalization and transfer. While this distinction can be applied to all training evaluation, it is particularly important for understanding behavior modeling evaluation criteria. In reproduction, the exact form of behaviors learned in training are exhibited in the evaluation context. Reproduction is usually assessed with a role play requiring trainees to model, as closely as possible, the same behaviors they viewed in the video scenarios they saw. In generalization, trainees exhibit behaviors of a similar--but not identical--type to those learned in training, perhaps using learned behavior in response to non-identical stimuli to that presented in training (Decker & Nathan, 1985). Generalization is usually assessed with a role play requiring the trainee to respond to a new situation not modeled in training (Decker, 1980, 1982). Transfer, then, is generalization and maintenance of training on the job, or at least outside of the instructional context. Transfer can only be assessed through ratings of supervisors or co-workers or via unobtrusive observational techniques.

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Linking Criteria to Industrial Training Objectives

While those interested in behavior modeling should attend to all three of the criteria defined above, it is clear that modeling of complex interpersonal or supervisory skills should be more interested in the latter two than the former. That is, reproduction is a sufficient evaluation criteria for simple motor skills, but not so with more complex skills--even though this is often overlooked in evaluations of the technique (Decker & Nathan, 1985; McGehee & Tullar, 1978).

To further illustrate this point, consider that much of the conduct being modeled in motor skills is exactly prescribed and hence it is desirable for trainees to adopt the modeled behaviors in essentially the same form as they are portrayed (Bandura, 1977). For example, there is little leeway permitted in the proper way to safely operate a power tool or perform a surgical operation. Consequently, the objective is to have trainees mimic behavior as closely as possible. However, in the case of interpersonal or supervisory skills, the objective is more to inculcate generalizable rules or concepts, specifying a class of behaviors to be used given certain stimuli are present, and not simply to enable the trainee to be able to reproduce only those behaviors specifically modeled. In fact, in the training of interpersonal and supervisory skills the title "behavior" modeling is perhaps a misnomer. The notion is

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that observers will extract the common attributes exemplified in modeled responses and formulate the rules for generating behavior under similar circumstances. The ultimate goal is to teach the trainee one or more principles, not strictly a list of behaviors, that will allow him/her to learn, generalize and apply behaviors different from those modeled (yet still exemplifying the principles) to different situations. This perspective is useful in exploring theory and research that may improve the behavior modeling technique.

Relative Contribution Of Behavior Modeling Components

The relative importance of the behavior modeling components has been systematically studied by some researchers. For example, Lira, Nay, McCullough, & Etkin, (1975) investigated the efficacy of modeling, role play, and no treatment in the reduction of avoidance behaviors and found that role play showed greater reduction of avoidance behavior than did the modeling or control conditions. McFall and Twentyman (1973) examined the relative contribution of modeling, role play, social reinforcement, and all possible combinations of those components to assertion training. These researchers found that role play and social reinforcement both made additive contributions to improved performance on self-report and behavioral assertion measures; more so than did modeling when added to role play or role play and social reinforcement. In addition,

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rehearsal plus social reinforcement was superior to modeling which was superior to instructions. Nelson (1982) showed that rehearsal contributed more than modeling in a study of alcoholics. This collection of studies suggests that modeling, as it is currently implemented, may be the weakest component in behavior modeling. That is, when the contribution of each component is determined relative to other components or combinations of components, modeling seems to add the least to effective training (Decker & Nathan, 1985). The findings from the studies reviewed above would seem to be an impetus for investigation of improvements to the components of the behavior modeling process, particularly the modeling component. Unfortunately, after a splurge of interest surrounding the development of behavior modeling, empirical research has seriously waned in the last few years. Some research has been carried out to evaluate particular applications (e.g., Meyer & Raich, 1983), but with the exception of the work of Decker and colleagues (Decker, 1980, 1982; Mann & Decker, 1984) nothing in the training literature has been reported on attempts to enhance the original behavior modeling process outlined by Goldstein and Sorcher (1974).

In a series of experiments, Decker (1980, 1982, 1984) examined the effects of different symbolic coding stimuli (learning points) on retention in behavior modeling training. Three types of learning points were described:

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summary label, rule oriented, and behavioral (Decker, 1984; Gerst, 1971). Each type had a different effect on behavioral reproduction and generalization to a novel setting. Specifically, Decker's research revealed that: (1) most learning points enhance behavioral reproduction and generalization when compared to a no-learning point condition; (2) summary label learning points do not enhance behavioral reproduction, but do enhance generalization; (3) rule-oriented learning points did contribute to behavioral reproduction and also enhanced generalization; and (4) behavioral learning points enhanced reproduction better than other learning points, but were less effective in facilitating generalization.

Decker's work on linking different types of learning points to different training outcomes is an excellent example of the type of research needed on behavior modeling. Nonetheless, no other research work in the industrial training literature could be found that explored modifications or improvements of the behavior modeling process. More research devoted to increasing the effectiveness of the components of behavior modeling is crucial if behavior modeling is to be improved and the process of learning via modeling is to be understood. In light of this research void, the focus of the present investigation was on enhancing the modeling component of behavior modeling.

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The Modeling Component

The modeling component of behavior modeling is intended to provide the majority of the cognitive aspects of the process and includes attention to a modeling display, mental coding, and mental rehearsal (Bandura, 1977; Goldstein & Sorcher, 1974). When Goldstein and Sorcher (1974) first presented the behavior modeling technique, existing theory and findings provided prescriptions for effective design of instructional modeling displays (Bandura, 1969, 1977; Miller & Dollard, 1941). Based on that research, Goldstein and Sorcher (1974) identified effective modeling displays as those that included: (1) a model that is similar to the trainees; (2) a live or video-taped acted (not naturally occurring) model; (3) a minimum of irrelevant details; (4) reinforcement for the model engaging in the desired behaviors; and (5) behavior models which depict the modeled behaviors with sufficient frequency and repetitiveness to make learning probable. Either through well-informed practitioners, academic consultants, or simply common sense, many of these characteristics have found their way into industrial behavior modeling practice (Byham, 1985; Rus-Eft & Zenger, 1985). A listing of the empirically supported important model characteristics is presented in Figure 1-3.

Despite widespread incorporation of the prescribed modeling characteristics, research reviewed previously indicated that modeling may still be the weakest component

Figure 1-3
Known Characteristics of Effective Modeling Scenarios

- key behaviors/principles labeled
- no irrelevant material
- skilled models
- models similar to observers (age, race, etc.)
- models reinforced for engaging in desired behavior
- relevant situations
- acted rather than naturally occurring scenarios

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of the process (McFall & Twentyman, 1973; Stone & Vance, 1976). Other authors have suggested that the relative weakness of the modeling component may be due in part to the use of simple, redundant and unrealistic video models (Parry & Reich, 1984). Put in terms of the learning theorist, existing modeling programs could be characterized as typically having a relatively low degree of variability in the learning stimuli presented to trainees. The following sections will describe the notion of stimulus variability and explore theory and research findings that suggest means of modifying the modeling component to increase variability and consequently enhance training outcomes.

The Principle of Stimulus Variability

Goldstein and Kanfer (1979) summarized the basic learning literature on generalization and transfer of learning and identified four principles which they defined as:

1. Provision of General Principles which provides trainees with general mediating principles for learning.
2. Overlearning which is designed to extend learning over more trials than are necessary to produce initial learning of the required skill.
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4. Maximizing Stimulus Variability which is intended to vary stimulus conditions during training so that training becomes associated with a wide range of cues.

Other authors have presented similar lists of principles (Ellis, 1965; Goldstein, 1974; Kazdin, 1975; McGehee & Thayer, 1961). Of the four general principles identified, stimulus variability is the only one of the principles that has been neglected in behavior modeling design and practice.

Interestingly, early research on learning (e.g., Bruce, 1933; McKinney, 1933) focused on the importance of stimulus similarity for learning. McKinney (1933) required his subjects to learn to associate a particular letter to a particular geometric pattern. After original training, subjects were shown variations of the geometric patterns and were tested for learning of the same response to these variations. Results showed quite clearly that the greater the amount of variation with the stimuli, the less frequent the learning of exact responses. Yum (1931) and Hamilton (1943) similarly found that stimulus similarity corresponded closely to learning when the desired responses were the same. In fact, it became an accepted maxim of that era that similarity helps learning (Ellis, 1965).

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What was obviously neglected in this notion was the case when desired responses were new or different than those displayed in training (i.e., generalization). Subsequent work by Gibson (1941), Duncan (1958) and Ellis (1965) clearly demonstrated a restriction on the general rule that similarity enhances training outcomes. As stated by Ellis (1965), a more enlightened notion captures the essence of the stimulus variability principle:

> If the stimuli or responses in the transfer context are different from those in the original learning context, then the greater the similarity of stimuli, the less the positive transfer--the greater the variability of stimuli the greater the transfer (p. 23).

Since a novel transfer context is generally a given in industrial training, the notion that variability is of more value than similarity has become widely accepted. As Kazdin (1975) notes,

> One reason that behaviors are not maintained and do not transfer to new settings is that behavior becomes associated with a narrow range of cues. As soon as the program is withdrawn, or the settings change, trainees may discriminate that the desired behavior is no longer associated with certain consequences. Thus, responses are not maintained and do not transfer to new situations. One way to program response maintenance and transfer of training might be to develop the target behaviors in a variety of situations or with differentially successful models. If the response is associated with a range of settings and other cues, it is less likely to be lost when situations change (p. 211).

Thus, stimulus variability attempts to avoid the problem of training becoming attached to a narrow range of cues. This is done by attempting to develop target behaviors within a context that provides an opportunity for learning to take

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place among several relevant stimulus conditions. Variability, the argument goes, serves to strengthen the observers's understanding so that he/she is more likely to see the applicability of a concept in a new situation (Ellis, 1965). Speaking specifically about models as learning stimuli, Bandura (1977) has similarly suggested that it is variability that fosters innovation and generalization. Bandura (1977) has further noted that, within certain limits, the more varied behaviors and resulting consequences a trainee closely attends to in a modeling display, the more information s/he will be potentially able to store and generalize to different contexts. The value of stimulus variability for enhancing training outcomes has also received some empirical support (Callentine & Warren, 1955; Duncan, 1958; Shore & Sechrest, 1961). For example, Duncan (1958) found that, on a perceptual paired associates task, generalization was markedly enhanced by training that varied the paired examples. When the total amount of practice was held constant, any amount of varied training, even using two stimuli rather than one, was more effective than training on a single stimulus. Other investigators have obtained similar results in concept attainment tasks, demonstrating that concepts are more easily attained when a variety of relevant examples are provided (Callentine & Warren, 1955; Shore & Sechrest, 1961). Specifically, Shore & Sechrest

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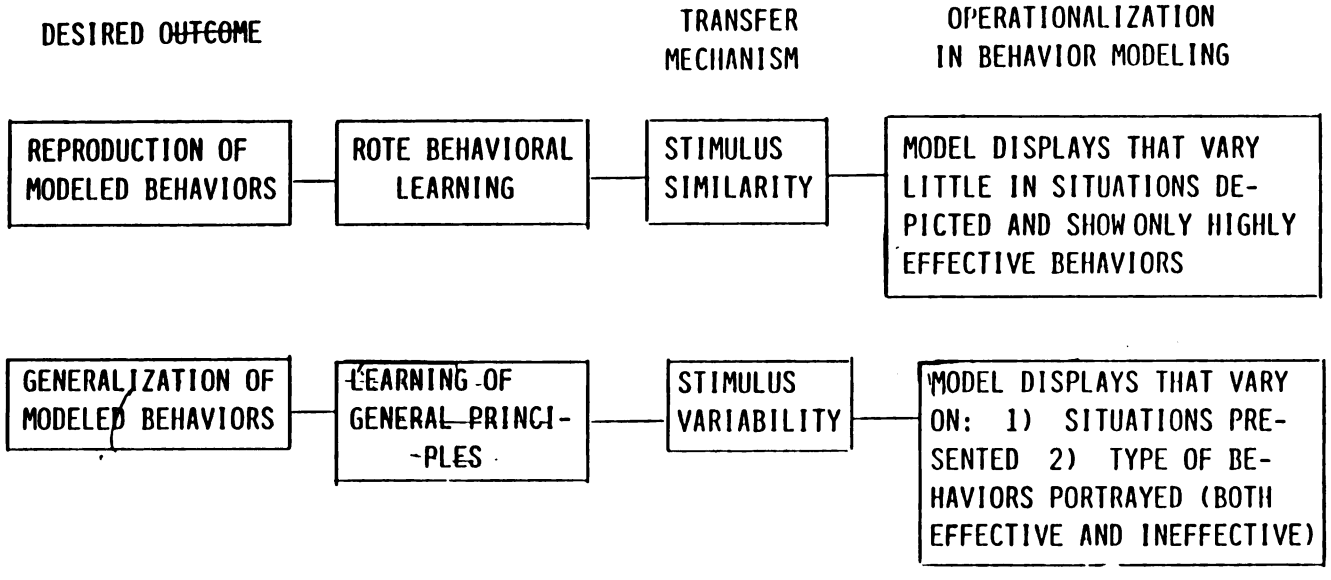
(1961) found evidence that a moderate number (2-3) different examples which are repeated a few times each was more effective in helping trainees learn a concept than using one example repeatedly or even offering different examples at once. In summary, when faced with identical or similar stimuli, trainees will be well-equipped primarily to reproduce modeled behaviors. When faced with diverse and varied stimuli trainees will be better equipped to generalize and transfer the rules learned, not just the identical behaviors, to a larger variety of situations. That is, the more variability and less redundancy in model displays the greater the chance of rule learning and subsequent generalization and transfer. Figure 1- 4 presents a simple model of the different training outcomes facilitated by stimulus similarity and stimulus variability.

Maximizing Stimulus Variability to Enhance Generalization

The prescription for behavior modeling programs implicit in the preceding discussion seems very straightforward; the more varied or diverse the modeling stimuli presented to trainees, the more likely those trainees will be to generalize and transfer learning to different contexts. Yet, despite the theoretical grounding and empirical support for the value of stimulus variability, it is a principle that has not found its way into the design and conduct of behavior modeling program modules. Models are typically very simple, often redundant and trainees are

FIGURE 1-4

A MODEL OF THE VALUE OF STIMULUS VARIABILITY ~~IN BEHAVIOR MODELING~~



conditioned to think that the specific behaviors modeled are universally applicable and the way to handle all such situations (Parry & Reich, 1984). With so little variability in modeled stimuli, it is perhaps not surprising that one recurrent theme in critical discussions of behavior modeling is a lack of belief that current modeling programs maximally facilitate generalization and transfer of learned behaviors to situations not illustrated during training (Parry & Reich, 1984; Robinson, 1980).

Operationalizing Variability in The Modeling Component

While the preceding research and theorizing make it clear that stimulus variability has the potential to enhance learner generalization and transfer, less clear is how variability might actually be operationalized in behavior modeling programs. Of most concern is to find means of increasing variability that would enhance trainee outcomes without adding prohibitively to the cost or timing of existing programs. Some methods of increasing variability in modeling such as using different media (i.e., live vs. video) or model actors (professionals vs. actual employees) have been explored and found to have no significant effect on trainee outcomes (Bandura, 1977; Russell, Wexley & Hunter, 1984). However, learning research previously discussed and recent anecdotal evidence from progressive training practitioners suggests that two more dramatic means of increasing variability in the modeling component,

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scenario variability and model-competence variability, would be more likely to affect important trainee outcomes. Scenario variability and model-competence variability are described and discussed below.

Scenario Variability. Perhaps the most obvious way to increase variability in behavior modeling would be to expose trainees to different video scenarios rather than just a single scenario. For example, if one video scenario in a program entitled "assertive communication" portrayed a model assertively requesting a refund from a retail store, a second scenario might be constructed to show the same model in an entirely different scenario (e.g., refusing to loan his/her car) that still embodied the principles of assertive communication.

Although no research has addressed this issue in industrial organization settings, several studies in the social and counseling literature suggest that multiple scenarios can enhance training outcomes (Bandura & Menlove, 1968; Kanfer & Goldstein, 1980; Kazdin, 1976; Lumsdaine, Sulzer & Kopstein, 1961). For example, Bandura & Menlove (1968) found that children who observed filmed models interact with several dogs, tended to show less fear than children who viewed a model with a single dog. Other studies have shown the superiority of multiple scenarios for teaching counseling skills (Cominsky, 1982) and error reduction in reading a micrometer (Lumsdaine, Sulzer &

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Kopstein, 1961).

Existing research evidence also suggests that varying the scenarios in which models are presented is of more importance than varying the model characters themselves. For example, Bandura (1977) concluded that, provided the models are realistic and similar to trainees, the actual characters themselves make little difference. Similarly, Russell, et. al. (1984) found that whether the model was a trained actor or an actual supervisor had no effect on training outcomes.

Based on the research just reviewed, it is perhaps reasonable to suspect that the more scenarios (of the type the trainee might be likely to encounter) that could be modeled, the better the chance of facilitating trainee generalization and transfer. However, the number of different situations presented has to be weighed against practical concerns including training time, cost and human processing ability. With respect to such practical concerns, the results of a study by Duncan (1958) are very encouraging. Duncan found that while generalizationn proficiency did incrementally increase as a function of increased variety of original training stimuli, the improvement was most marked in going from only one to two different stimuli. The increase was considerably less going from two to five different stimuli. That is, the enhancement due to stimuli variety occurred with only a

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small increase in the number of training tasks. Moreover, with respect to the cost of increasing variability, recent work on applying utility formulas to training and other interventions means that ascertaining the financial cost/benefit of different training programs can now be done empirically rather than solely on a subjective basis.

While the inclusion of multiple scenarios is hardly a novel idea, the value of such a practice, vis a vis conventional repeated scenarios, has not been empirically supported in industrial training contexts or with complex social skills. Moreover, the limited empirical attention has not focused on criteria of generalization and transfer, which are of primary concern in this investigation.

Model Competence Variability. A more innovative and controversial option for increasing variability in behavior modeling is to vary the competence of the models displayed. That is, models can be varied in terms of some being effective, performing the key behaviors correctly and with high competence, and others being ineffective, performing the key behaviors incorrectly or not at all. As mentioned earlier, most current industrial behavior modeling displays use exclusively effective models, although some progressive training firms have intiated limited use of negative examples (Rus-Eft & Zenger, 1985). The nearly exclusive use of positive models is not surprising in that positive

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information has been traditionally preferred in a learning context because it makes desired points or behaviors directly perceptible (Bruner, Goodnow & Austin, 1956). Negative information, on the other hand, does not put the desired knowledge or behaviors in direct view but in effect simply shows what "is not" correct (Bourne, 1970). Moreover, it has been argued that positive instances somehow provide more information or are easier to assimilate than negative examples.

Despite the traditional positive information bias among education and training researchers, a number of writers have argued that negative examples, in combination with positive examples, provide variability of stimuli that can improve generalization above all-positive or all-negative examples alone (Becker & Englemann, 1977; Bruner, Goodnow & Austin, 1956).

Conceptual support for the value of variably competent models is provided in a book on the subject of learning and generalizing new concepts by Bruner, Goodnow and Austin (1956). The authors suggest that in the course of trying to learn a new concept, one could conceivably be exposed to instances of three types: (1) positive, whereby the instance exhibits the characteristics consistent with the concept; (2) negative, whereby the instance does not exemplify the concept being sought; and (3) irrelevant, whereby the instance does not relate to the concept at hand. The

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authors theorized that both positive and negative instances can be informational in that each allows the observer to either confirm or refute a hypothesis tentatively developed concerning the desired concept. A combination of the two types of examples was concluded to be the optimal instructional approach and this notion has been supported elsewhere both conceptually (Becker & Englemann, 1977) and empirically (Bourne & Guy, 1968; Smoke, 1933).

For example, Bourne and Guy (1968) found that, in the case of learning the rules for accurate problem solving on mathematical problems, subjects performed best on generalizing all rules when the greatest variety of instances (mixture of positive and negative) were presented. Smoke (1933) similarly showed that those subjects exposed to a combination of positive and negative instances were less likely to make snap judgments and made wrong generalizations less frequently than those learning from positive consequences alone. Although the principles, rules and learning points of effective interpersonal behavior typically taught in industrial behavior modeling programs are considerably more complex than those used in concept learning research, it is argued here that the value of the effective/ineffective combination will be similar. That is, modeling displays allowing trainees to see both correct and incorrect models in juxtaposition will enable them to better distinguish the concepts or principles that make good models

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Stimulus Variability and Social Learning Processes

Beyond the evidence presented above, a case can be made that increasing variability is a well-directed strategy based on its potential positive effects on two processes underlying social learning, namely, attention and retention (Bandura, 1977). With respect to attention, Bandura (1977) identified several factors contributing to individual's motivation to attend to models including the diversity and the perceived functional value of models presented. While the diversity of variably competent models, vis a vis strictly effective models, is self-evident, multiple scenarios varied in terms of effective-ineffective behaviors may also enhance what might be called "unlearning". Unlearning is relevant in situations where trainees enter a training program with a preconceived understanding of the training content that is inconsistent with the desired principles. In such a case, in order to be successful in inculcating trainees with desired learning, the task is not simply to teach and strengthen new, effective behavior strategies but to also extinguish old, ineffective ways of coping with situations. To maximize such unlearning, a trainee must be made aware and accept that existing behavior patterns are ineffective and be provided with alternative effective behaviors to model. It is suggested here that the

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trainee exposed to multiple examples and "what not to do" may be more inclined to do this. That is, the exposure to wrong ways of performing a skill, possibly parallel to trainees existing behavior, will induce the trainee to unlearn established principles and attend to the new correct illustrations of desired principles. Smoke (1933), in an early study of concept learning, found that of the three learning treatments used on each subject in his experiment (all-positive instances, all-negative instances, combination of positive & negative instances) the majority of subjects preferred learning from the combination of positive and negative. With respect to trainee retention, human memory researchers have suggested the idea of "depth of processing" to describe differences in the way information is encoded and subsequently remembered (Craik & Lockhart, 1972). Craik and Lockhart (1972) suggest that it appears that whether an item is deeply processed in memory may be affected by a number of factors, one of which is the contrastive nature of the stimulus items presented. That is, if the stimuli presented induce the observer to form a distinctive and contrastive mind picture then he/she will subsequently be better able to identify and remember desired learning. Bandura (1977) has similarly noted that the distinctiveness of the stimuli is a key factor in subsequent retention of social learning. Consistent with this perspective, Mann & Decker (1984) have shown that including the learning points

on the video display itself enhanced trainee recall in a study of the behavior modeling of assertive skills. Lombardo & McCall (1983) found that experienced managers reported that they had learned as much, or more, from observing ineffective bosses as they had from effective examples. Managers noted that lessons learned from an ineffective boss were often remembered longer, sharpened the contrast for recognizing more effective bosses, and served as salient reminders of ineffective and dysfunctional strategies to avoid on their own part.

Based on the conceptual and empirical evidence presented, it is expected that multiple scenarios varying in model competence will enhance trainee motivation to attend and retention. Consequently, since social learning theory prescribes that a prerequisite to positive learning outcomes such as generalization and transfer is attention and retention, these two variables will explain a significant amount of variance in dependent measures.

A Counter Argument

Although arguments in favor of increasing the variability of modeling stimuli are persuasive, direct generalization of the basic findings reviewed here to the behavior modeling technique is not advisable without empirical test. First, the empirical research is quite limited and that which does exist often used very simple behavior sequences (nonsense syllables, hand movements,

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constructing tinker toys) as learning stimuli. Such training content is much less complex than would be expected to be of interest in industrial training applications and no empirical research of the variability notion has been conducted in an industrial type behavior modeling program.

Second, and most importantly, some training writers and practitioners have argued against change in the basic behavior modeling method, particularly with respect to using scenarios which depict anything less than high competence in the desired skills. For example, with respect to the proposed manipulation of model competence variability, it has been suggested that the inclusion of ineffective examples would add no value above that of repeated positive examples and, in the worse case, might interfere with positive learning and generalization. Moreover, one empirical study in the counseling literature compared mixed competence models with pure positive models and found that the pure positive were the most effective in facilitating trainee reproduction of questioning skills (Alssid & Hutchison, 1977). However, two points regarding the cited study cast some doubt on its value as support for the argument that only high competence models should be portrayed. One, the researchers did not control for amount or time of video exposure, hence their results were confounded by the amount of information presented to each condition. Specifically, those in the pure positive group

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were exposed to more task relevant information than those in the mixed condition. Two, the modeled task was a relatively simple questioning skill and the evaluation criteria was a reproduction task. As previously discussed, industrial training generally involves the training of complex social skills and criteria of generalization and transfer are of paramount concern.

Nonetheless, the existence of a conceptual debate highlights the need for empirical evidence from the type of experiment conducted here. There remains no empirical data from an industrial social-skill training context, to provide any evidence on this issue, allowing neither rational support or refutation of either argument.

Research Hypotheses

The research hypotheses presented in the following section are presented in terms of research condition and categorized by dependent variable. Therefore, prior to the presentation of the hypotheses, a general description of the training design and the dependent variables is provided. The Method chapter of this dissertation thoroughly outlines the specifics of the experimental design and the development, operationalization and timing of dependent measures.

The present study used a 2 (multiple vs single scenario) X 2 (effective only vs effective & ineffective models) design. The two manifestations of variability,

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scenario variability and model competence variability, were derived from the discussion of alternate means of increasing stimulus variability in behavior modeling. Thus, depending on experimental condition, trainees were exposed to either one repeated effective scenario, two different effective scenarios, a single scenario shown once with an effective model and once with an ineffective model, or two scenarios each shown with both an effective and an ineffective model.

Expanding on the basic training evaluation model of Kirkpatrick (1967) and the excellent behavior modeling evaluation examples of Decker (1980) and Decker & Mann (1984), five training outcomes were used as dependent variables in this study. The five measures include a self-report measure of trainee reaction to the training, a paper and pencil evaluation of learning of the principles, and three behavioral measures evaluating trainee proficiency to reproduce, generalize and transfer modeled skills. A brief overview of these type of training outcomes is presented below.

Reaction. Reaction measures are designed to assess trainee perceptions of the value of his/her training module, predicted use of the skills taught, and effectiveness of the trainer, method and videos. Behavior modeling programs have been repeatedly shown to get favorable reactions from participants (Decker & Nathan, 1985; Kraut, 1976; Russell & Mayer, 1985). As previously mentioned, relative to other

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approaches, modeling makes relatively light demands on learners and instructors and people generally like to learn by imitation. In this study, since all trainees receive the same amount of modeling in an identical format, and have no knowledge of what went on in other conditions, generally high trainee reactions are expected. That is, trainee reactions are not expected to be significantly associated with increased variability.

Paper & Pencil Learning. Learning measures typically ask trainees, immediately upon conclusion of their program, to indicate understanding of concepts derived directly from the learning points of the particular training module they attended. Past behavior modeling programs have also been shown to be very effective in fostering learning of desired principles measured with a paper and pencil exam (Decker & Nathan, 1985; Russell & Mayer, 1985). In this study, because all trainees will be exposed to a program of the same length, with an equivalent amount of modeling (though different in form), and identical in all other respects, it is expected that all trainees will have a relatively high learning score with no differences across conditions expected. That is, increased variability is not expected to be associated with scores on the paper and pencil learning measure.

Reproduction. Reproduction measures typically assess trainees ability to accurately reproduce, in a simulated role play, the same behaviors they saw modeled in their

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training module. Along with reaction and paper & pencil learning exams, reproduction measures are what have been most frequently used to evaluate modeling programs (Russell & Mayer, 1985). Modeling has been shown to be a very effective technique for achieving high reproduction score. However, as previously discussed, a reproduction measure is an insufficient indicant of trainee ability to generalize or transfer learning to novel contexts--though such measures are often used as evidence of those criteria of training effectiveness. One objective of this research is to demonstrate that it is possible to have excellent reproduction ability without a corresponding ability to generalize behavior to other settings. It has been previously argued that the stimulus characteristics that lead to reproduction are different than those that lead to generalization. Specifically, stimulus similarity promotes reproduction while stimulus variability promotes generalization. Based on that model, it is expected that those conditions with the highest degree of stimulus similarity will yield the highest reproduction scores. That is, increased variabilityis expected to be negatively associated with scores on the reproduction measure. That is, trainees exposed to the most repetition and <u>least</u> variability are expected to achieve the highest reproduction scores.

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Generalization. Although assessed less frequently than reproduction, generalization has also been generally measured with a simulated role-play. The key difference is that a role-play designed to assess generalization involves a situation different than that observed in the training program. That is, the trainee is asked to perform in a novel context though one that still allows for application of the learning points taught in his/her training module. Recall that the principle value of increasing variability was theorized to be that it would enhance subject ability to generalize behavior to a novel context. Therefore, increasing variability is predicted to be positively associated with generalization scores.

Transfer. Reproduction and generalization role-plays are proven means of differentiating among levels of outcomes from a training intervention (e.g., Decker, 1980). However, such measures share the research limitation of being "simulated" and thus do not allow inferences with respect to whether trainees actually do use trained skills in their actual jobs or social contexts. Since the focus of most experimental training evaluation studies is primarily on whether a training manipulation can positively influence training outcomes, and inferences are drawn between groups, this is not terribly problematic. Nonetheless, several reviewers of the training literature have long noted that it would certainly strengthen inferences drawn if some evidence

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could be obtained on whether trainee transfer, defined as use of trained skills, knowledge or ability outside of simulated study conditions, was positively influenced by experimental manipulations. That is, the ultimate test of any training program is whether the effects can be demonstrated in non-simulated situations and hold up over time. Such a transfer measure will be employed in this study and hypothesized outcomes on that measure are identical to those with the generalization measure. That is, increasing variability is expected to be positively associated with higher transfer proficiency.

A summary of the hypothesis is provided below.

Hypothesis 1: Variability will not be significantly associated with trainee reactions.

Hypothesis 2: Variability will not be significantly associated with trainee paper and pencil learning.

Hypothesis 3: Variability will be negatively associated with trainee reproduction.

Hypothesis 4: Variability will be positively associated with trainee generalization.

Hypothesis 5: Variability will be positively associated with trainee transfer.

Summary

Complex learning necessitates more diligent application of the existing learning principles and consideration of learning research that may contribute to improving training

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effectiveness (McGehee & Thayer, 1961; Gagne, 1977). One such principle is stimulus variability. This investigation explores the effects of increasing stimulus variability in behavior modeling training. The underlying theory and design of behavior modeling was described and the literature evaluating the effectiveness of the technique was reviewed. It was shown that existing behavior modeling programs are particularly effective in inculcating trainees with the ability to remember and reproduce exact behaviors taught. Less confidence can be placed in the evidence documenting the technique's efficacy in facilitating generalization or transfer of learning to different contexts. It was also shown that the modeling component, as currently implemented, is the weakest component of the overall behavior modeling process although little research has been devoted to its improvement.

The principle of stimulus variability was introduced and several studies indicating the principle's potential value for facilitating generalization and transfer of learning were reviewed. It was suggested that variability in behavior modeling could be feasibly increased in two ways: (1) scenario variability, whereby model displays effectively depicted the desired assertiveness principles in distinctly different scenarios; and (2) competence variability, whereby models depict the desired principles both effectively and ineffectively. Theory and research

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evidence in support of each form of variability was presented and their link to the social learning processes of attention and retention examined.

Based on the conceptual scheme presented it is expected that increases in variability--incorporating different scenarios and both effective and ineffective models--will strengthen the modeling component and the behavior modeling approach overall.

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Chapter II

METHOD

Overview

This chapter describes the method and procedure of the study used to test the hypotheses discussed in Chapter I. First, the development and pilot test of the training program and video scenarios is described. The next section describes the study design, experimental conditions, and procedure. Subsequent sections describe the trainees, operationalization of measures, and data analysis procedures.

Training Program

The training program used in this study was on assertive communication skills. Assertive skill training has been used by Decker (1980, 1982) in previous behavior modeling research investigations and is one of the most popular topics for interpersonal skill training in industrial contexts (Whetten & Cameron, 1984). Consistent with the work of Decker (1982), the training program in the present study was based on the model of assertiveness developed by Smith (1975). Smith (1975) defines assertive communication as direct expression of one's feelings, preferences, needs, and/or opinions in a manner that is

neither threatening nor punishing to another person and does not involve undue amounts of anxiety or fear for the person exhibiting the assertive behavior.

Drawing on the previous work of Smith (1975) and Decker (1980) extensive support materials for presenting a tested and successful training program on assertive skills were readily available and adapted to the present study. Such materials included behavior learning points, and realistic role plays suitable for use as reproduction and generalization dependent measures (the list of learning points and a description of the role-plays used in this study are included in the Appendices A & B, respectively). However, the nature of the experimental manipulations in this study required the development of modeling stimuli tailored specifically to this particular program. The next section describes the development of those video scenarios.

The Video Scenarios

The modeling stimuli in this study were videotaped sequences of persons using assertive communication skills in two different scenarios. The two different scenarios were selected, by a pilot group of 25 trainees, from a longer list of potential scenarios, as the most relevant and pervasive assertive situations trainees would be likely to encounter. One scenario involves the model character interacting with a car dealer who has done an inadequate job of repair on the model character's brakes. The second

scenario involves the model character interacting with a friend who wants to borrow his car. Once the two scenarios were chosen, each was filmed in two forms: an effective example of using assertive skills in that situation and an ineffective example of assertive communication in that situation. All video scenarios featured the model character Scott, played by a graduate student of the same name, who was familiar with assertive skill training. Therefore, the four videos and their denotation in this study were: (1) Scott using effective assertive skills in requesting his car be repaired properly (Video A); (2) Scott using ineffective assertive behavior to request his car be repaired properly (Video A -); (3) Scott using effective assertive skills to refuses to lend his car (Video B); and, (4) Scott using ineffective assertive behavior to refuse to loan his car (Video B -).

The specific scenarios filmed have been suggested by Smith (1975) as effective for teaching introductory assertiveness skills. Also, the scenario scripts were constructed to incorporate the use of (or misuse of in the ineffective videos) the six specific behavior learning points presented in the training program. The scripts for the four scenarios are included in Appendix B.

Pilot-Test

A pilot test was conducted to ensure that the modeling stimuli included all attentional processes outlined by

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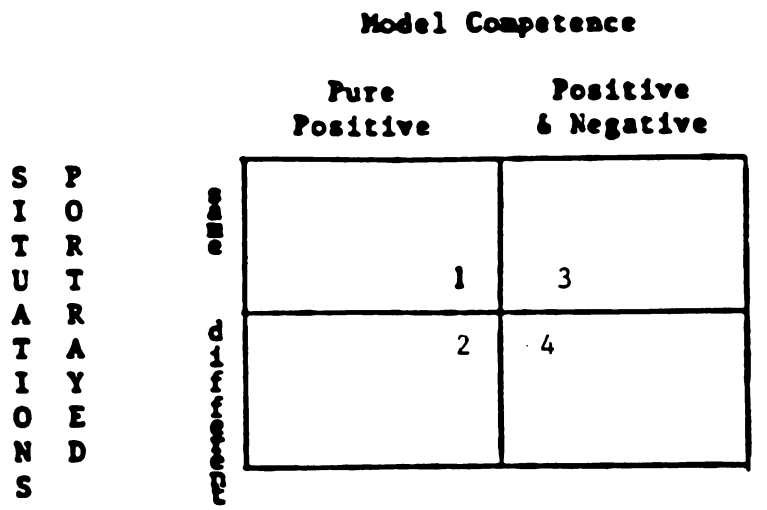
Bandura (1977) and Goldstein and Sorcher (1974) and that the subject pool had low baseline skills in the verbal assertive skills to be trained. A low baseline was desirable in order to allow for maximum ability to isolate effects of the training manipulation and reduce the chance that subjects could perform well on the behavioral dependent measures even without the training. The pilot test was conducted on a sample of 25 volunteer trainees drawn from a population of students taking the same undergraduate management course one term prior to those in the present study. Results of the pilot-test were consistent with previous tests of video scenarios used in assertiveness training (Decker, 1980, 1982) and found that pilot trainees perceived: the models as believable and similar to themselves; the situations as relevant; the displays clear and free of extraneous distractions; the learning points as very distinctive; that positive and negative were clearly distinguishable; and that the models were positively (or negatively) reinforced for their correct (or incorrect) behavior. In addition, pilot testing demonstrated that the subject pool had low baseline skills in the specific assertive skills to be trained. That is, given the learning points but without any training, subjects were poor at trying to effectively role-play the assertive situation used as the generalization measure in the principle study. These findings are consistent with previous research (e.g., Decker, 1980; Smith, 1975) which

found a low baseline rate does exist for the type of assertive communication skills taught here.

Design

A 2 X 2 design crossing scenario variability (two vs one scenario) with model competence variability (effective only vs effective & ineffective model) was used in this study. Trainees were randomly assigned to one of four conditions exposing them to either: (1) one repeated effective scenario; (2) two different effective scenarios; (3) a single scenario shown once with an effective model and once with an ineffective model; or (4) two scenarios each shown with both an effective and an ineffective model. A graphic representation of the research design is presented in Figure 2-1. In an effort to avoid confounds that have plagued this type of research in the past (e.g., Alssid & Hutchison, 1977) a number of factors were controlled to ensure balance across conditions. For example, the focal model character was kept constant through all scenarios to avoid contamination potentially associated with different model characters. In addition, time of video exposure and number of modeled behaviors presented was equalized across condition to eliminate the possibility of alternative explanations associated with those factors. Further, since Bandura (1977) suggests that at least two showings of a scenario is much superior to a single showing, equalizing exposure in this study meant that a subject in any of the

Figure 2-1
Research Design



four experimental conditions actually saw a total of four video showings in the course of his/her program. Using the denotation established earlier, depending on his/her experimental condition, a trainee saw either: (1) A, A, A, A; (2) A, B, A, B; (3) A, A-, A, A- ; or (4) A, A-, B, B-. Of course, the order of the videos could have been done in a number of ways other than that used here. However, in the absence of any existing empirical or conceptual rationale for alternate orderings, it was felt appropriate to present first the one video common to all conditions and, in the competence variability conditions, to have the positive precede the negative. The implication of altering this order is an interesting empirical question but beyond the scope of this study.

Subjects

72 volunteer trainees were drawn from an undergraduate management course. Participating trainees received some minimal course credit for their attendance at the program but the program was presented to trainees as a unique opportunity to receive training in an important management competency in a low-cost professional seminar. The distribution of subjects to conditions was on a random basis and the trainees were unaware of the particular manipulation of their group. That is, they assumed that the division of training groups was done solely for logistical reasons. The total pool of 72 trainees included 30 males and 42 females

and the gender distribution of the four conditions was: (1) 10 males; 8 females (2) 7 males; 11 females (3) 7 males; 11 females (4) 6 males; 12 females.

Several authors have argued that even under conditions of randomization, it would still be wise for training researchers to identify and measure variables suspected, a-priori, to correlate with dependent measures (Arvey, Cole, Hazucha & Hartanto, 1985). Measurement of such variables makes it possible to use analysis of co-variance designs which allow more precise detection of differences in dependent measures by removing extraneous variance associated with the co-variates. However, since each co-variate included in the analysis results in a loss of a degree of freedom, it is advisable to only include co-variates known to significantly correlate with dependent measures. As Arvey, et. al. (1985) note, "... the loss of a degree of freedom for a "worthless" covariate may actually render ANCOVA appreciably less powerful than posttest designs" (p. 501). In this study, measures of three individual trainee variables; assertiveness prior to training, grade point average, and gender; were suspected to potentially correlate with dependent measures and thus measured prior to the training program. Details with respect to the measurement of these variables are described below.

Pre-Assertiveness. A trainee's general level of assertiveness prior to training was thought to be one potential influence on the dependent variables. Therefore, a 50-item self-report scale designed to measure assertiveness in college students called the College Self-Expression Scale (Galassi, DeLo, Galassi & Bastien, 1974) was administered. The scale was felt to be particularly appropriate in that the wording of the items was tailored specifically to the trainee pool and there was published evidence in support of its reliability and convergent validity (Galassi & Galassi, 1975).

Grade Point Average. A number of authors have suggested that individuals vary greatly in their ability to learn, generalize and transfer training and this can be a potent influence on training outcomes (e.g., Gorden & Cohen, 1973; Robertson & Downs, 1979). Therefore, in this study, the trainees overall collegiate Grade Point Average was collected and used as an estimation of the trainee's ability to learn. While it might be argued that GPA is not the best approximation of true learning ability, for the purposes of this investigation, it was deemed an adequate surrogate.

Gender. The use of gender as a research variable has been criticized in behavioral science research on the grounds that it is a convenient and far too gross categorization which only directs attention away from more precise underlying variables and explanatory phenomena. It

is a popular conception that females are generally less assertive than males and some empirical research suggests limited support for that contention (Jackson, 1974). While previous research on the specific assertive skills trained in this study have not indicated any specific gender differences (Decker, 1980, 1982), the gender composition of each condition was obtained for use as a co-variate.

Procedure

The following description of the training procedure refers to each of 12 groups. That is, the procedure was repeated 12 times -- three groups of six trainees from each of the four experimental conditions. The trainer used a prepared script and, with the exception of the two experimental manipulations of variability in the modeling scenarios presented, all sessions were identical. All trainees attended a 2.5 hour training session entitled "Assertive Communication: A Critical Management Skill". The sessions were conducted in a manner similar to the modeling component of a typical behavior modeling program. The session began with an introduction of the trainer and a general overview of the topic of assertiveness skills by the trainer. This was followed by the presentation and discussion of the underlying principles and behavioral learning points of assertive communication. All trainees were given a copy of the learning points and asked to read them over carefully and to ask for clarification on any

points they did not fully understand. Next, trainees were instructed to think about each of the learning points and then to write down, in their own words, an interpretation of each learning point. In terms of Bandura's (1977) social learning theory, this stage is referred to as the symbolic coding of the training material. Symbolic coding was followed by presentation of the four filmed scenarios. Each video scenario was shown and followed by a brief period where trainees were instructed to write down the behaviors observed that corresponded to the learning points. After the final video was shown, trainees were assessed on the relevant dependent measures. The next section describes the operationalization and timing of those dependent measures.

Operationalization of Dependent Variables

As introduced in the previous chapter, five dependent measures were obtained: reaction, paper & pencil learning, and behavioral measures of reproduction, generalization and transfer. The measurement and timing of each of these measures is outlined below.

Reaction. The reaction measure was a 10-item, 5-point Likert scale assessing trainee perceptions regarding the value of his/her training module, predicted use of the skills taught, and effectiveness and contribution to learning of the trainer, method and videos. The reaction measure was derived from those commonly used in behavior modeling practice and research and was collected immediately

following the training session. A trainee's reaction score was determined by summing his/her totals on the 10 items and dividing by 10. The higher the score the more favorable the reaction to the program.

Paper & Pencil Learning. The learning measure was also of the sort typically used in modeling evaluation. Immediately after the conclusion of the training session the subject was asked to define each of 12 items derived directly from the six learning points of the program. The twelve item total consisted of two items associated with each of the six learning points. Content validity was assessed by asking three graduate students to match the scale items to the appropriate learning point. All three were perfect in their matching. The learning measure was scored on a 4 point scale (0-3) with 3 -mastery of the concept, 2 -understanding of the concept, 1 - some limited understanding of the concept and, 0 - no understanding of the concept. Subjects were asked not to guess if they didn't know an answer. Score on the learning measure was calculated by summing the score on the 12 items. Scoring was done by two trained Doctoral students and interrater reliability was assessed.

Reproduction. The reproduction measure was also taken immediately after the training session and asked subjects to reproduce, as accurately as possible, the model performance in Video A which they had viewed during the session. Video

A was used because it was common to all conditions. That is, while some conditions had seen it more than others (in fact, condition 1 saw it four times) all trainees had at least seen it once. The experimenter role-played the situation with the subject using the same exact words as the person in Video A. The trainee was told to respond to the experimenter in exactly the same way as the model in the training display responded and the trainee performance was video-taped for later scoring. A 12-item scoring scale, corresponding to the 12 possible assertive responses, was constructed and the taped scenarios were rated by two trained graduate students. Reproduction score was calculated by summing scores on the 12 items and dividing by 12. Interrater reliability was assessed.

Generalization. The simulated generalization measure was taken one month following the reproduction measure. The measure consisted of the trainee role-playing a situation different than that observed in the training program, but still allowing for application of the assertive principles taught in the program. The role play used was another scenario adapted from Smith (1975). The scenario was video-taped and scoring was similar to the reproduction measure using an 8-point scoring scale (corresponding to the 8 possible assertive responses). Scoring was done by two trained Doctoral students, blind to research condition and interrater reliability was assessed. Trainee score on the

simulated generalization scale was calculated by summing scores on the 8 items and dividing by eight. The role-played scenario and scoring scale for the simulated generalization scale are presented in Appendix D.

Transfer. While behavioral in nature and clearly superior to only reaction or paper and pencil measures, the reproduction and role play generalization measure share the research limitation of being "simulated". That is, while subjects do have to perform (and cannot just quickly and blindly fill out a questionnaire), they are still completely aware that they are part of a study. Since the focus of the study is primarily on whether a training manipulation can positively influence trainee behavior (and inferences are drawn between groups) this is not terribly problematic. The previously described measures are proven (e.g., Decker, 1980) means of differentiating among levels of outcomes from a training intervention. Nonetheless, it would strengthen inferences drawn if some evidence could be obtained on whether subject assertive behavior was different across groups measured outside of simulated study conditions. With this in mind, an unobtrusive transfer measure was also collected and a description of the procedure used for this measure follows. After completing the post-study questionnaire each trainee was thanked and told that he/she had completed the investigation. However, each trainee was asked to stop and see a friend of the experimenter

(stationed down the hall and actually playing the role of confederate for the present study) who would like a few minutes with each of them. Upon meeting with each subject, the confederate explained that he was doing a study of his own and was trying to raise money for his research by promoting the sale of business publications such as Business Week, The Wall Street Journal and Fortune. While the confederate was promoting a three publication offer as a good deal for the student, in actuality it was far more than the students would ever read. Most importantly, it was offered at a price (i.e., $72.50) that most students would find prohibitive. The experimental objective was to create a situation that would unobtrusively stimulate the subject to utilize assertive skills without the feeling that they were doing it simply for the experiment or other socially desirable reasons. Recognizing that all subjects would resist, but in different ways, the confederate was provided with a set script that directed him to use the same manipulative pleas regardless of the nature of subject resistance. This allowed for all subjects to be given the same stimuli to respond to, and controlled for any confounds that might have occurred had the confederate tailored his responses to each individual trainee. After breaking off the session, the subject was immediately debriefed and given some informal feedback on their use of the assertive skills. The scenarios were audio-taped and rated by two trained

Doctoral students blind to condition. The scoring scale was a five-item rating scale (corresponding to the five possible assertive responses) and the unobtrusive transfer score was calculated by summing the score on the 5 items and dividing by 5. Interrater reliability was assessed.

Process Measures

The hypotheses of this study suggest that increasing the variability of stimuli will positively affect training outcomes such as learning, generalization and transfer. Training outcomes such as generalization and transfer are the paramount concern of training designers and managers.

However, from a scientific perspective, it is useful to collect information relevant to determining more precisely how stimulus variability may affect variables which, in turn, have been shown to affect those training outcomes. Such variables are typically thought of as "process" variables in that measurement and analysis of such variables is useful in helping to identify and understand the process by which a manipulation did or did not produce the hypothesized outcome.

As discussed in Chapter I, the processes underlying learning from modeling are those of social learning, namely, attention, retention, reproduction and motivation. Most relevant to this study are the process measures of attention and retention. An objective measurement of attention requires technology beyond the scope of this study.

However, a self-report measure of each trainee's motivation to attend was adopted as a surrogate. Retention was measured with a second administration of the paper and pencil learning measure given four weeks after training. Much like the pre-measures discussed earlier, observing significant correlations between the process measures and the dependent measures warrant the use of these variables as co-variates. Bandura (1977) reviewed an extensive empirical literature which suggests attention and retention are, indeed, two variables which impact on the amount of observational learning that will occur. Based on the nature and timing of the process measures collected in this investigation (e.g., retention could not affect reproduction here because it was collected one month after the reproduction role-play was administered) it was expected that motivation to attend might be a significant co-variate of paper and pencil learning, reproduction, generalization and transfer. The measure of retention, given one month after training, was expected to be a significant co-variate of generalization and transfer since those were the only two variables that were measured after the retention score was attained. Using the variables of motivation to attend and retention as co-variates in the analysis allows statistical determination of the amount of variance explained by the co-variate and that attributed to the variability

manipulations. The operationalization of the two process measures is discussed below.

Motivation to Attend. The motivation to attend measure was a 7 item 4-point Likert scale that asked trainees to self-assess the degree to which they were motivated to attend to each of the 4 model stimuli they saw.

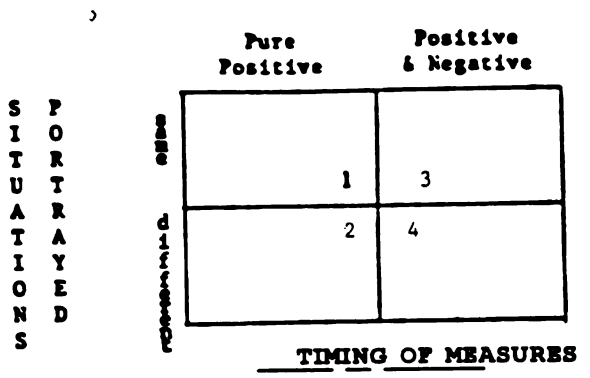
Retention. The retention measure was the same 12 item paper and pencil learning measure given immediately after the program, the only difference being the timing of the measure. To assess retention, the 12 item test was administered 4 weeks after training. The retention measure was scored by two trained Doctoral students, blind to condition, and interrater reliability was assessed.

Data Analysis Procedures

Two stages of data analysis were conducted in this study, confirmatory and exploratory. The confirmatory analysis was done first, and consisted of a series of multiple regressions to test for the hypothesized effect of stimulus variability in general (without a distinction between the two manifestations) on the five dependent measures. A graphic representation of the five hypotheses presented in Chapter I is provided in Figure 2-2. In order to conduct multiple regression, the four conditions were dummy coded as follows: condition 1 - low variability; condition 4 - high variability; and conditions 2 and 3 - medium variability. Conditions 2 and 3 were both coded as

Figure 2-2

Research Hypotheses & Timing of Dependent Measures



HYPOTHESES:

REACTION (T-1)
1 = 2 = 3 = 4

PAPER & PENCIL LEARNING (T-1)
1 = 2 = 3 = 4

REPRODUCTION (T-1)
1 > 2 = 3 > 4

GENERALIZATION (T-2)
1 < 2 = 3 < 4

TRANSFER (T-2)
1 < 2 = 3 < 4

MOTIVATION TO ATTEND (T-1)
RETENTION (T-2)
PRE-ASSERT (T-0)
GPA (T-0)

TIMING OF MEASURES

T-0 = Prior to Training
T-1 = Immediately after Training
T-2 = 4 Weeks after training

medium variability since no differences between those conditions were hypothesized for any of the five dependent variables. As discussed in Cohen and Cohen (1983), the purpose of dummy-variable coding is to render the information of membership in one of g groups by a series of g-1 dichotomies. Therefore, the confirmatory analysis in this investigation included the three groups of high, medium and low variability designated above, which were fully described by two independent variables (LV,HV). Specifically, condition 1 was coded low variability (1,0), condition 4 was coded as high variability (0,1) and conditions 2 and 3 were both coded as medium variability (0,0). No third variable to represent medium variability was either necessary or desirable since it would be wholly redundant (Cohen & Cohen, 1983). That variable is represented implicitly and can be thought of as a reference group representing neither high or low variability. The interpretation of multiple regression using the dummy coding of categorical variables is straightforward and similar to that of conventional regression utilizing interval data. That is, because each dummy variable is a dichotomy that expresses a meaningful aspect of group membership, it yields a meaningful r with the dependent measure. Similarly, the sign of the r indicates the direction of the relationship and the proportion of variance in Y accounted for by the independent variables (dummy coded) is interpreted

identically to conventional regression (Cohen & Cohen, 1983). Hence, in this investigation the principle question, described in terms of the regression equations, is whether the mean of Y in each group (i.e., low, or high variability) is larger (positive coefficient) or smaller (negative coefficient) than the mean of Y for nonmembers of that group.

The use of multiple regression analyses for the confirmatory hypotheses tests in this investigation was chosen over ANCOVA with multiple comparisons--the typical analysis procedure used with this type of experimental design--primarily to increase statistical power. Statistical power is the probability of correctly rejecting the null hypothesis and asserting the alternative hypothesis. Power of .80 is frequently cited as an appropriate convention for behavioral science research (Cohen, 1977). Statistical power is an issue that has been overlooked in reports of training investigations (Arvey, et. al., 1985). In fact, Arvey and his colleagues reviewed the training evaluation literature and found that the average statistical power to detect medium size effects was only .50. Similalry, an ANCOVA design using all covariates previously designated would yield a power of only .55 to detect a medium effect size in this study. On the other hand, using the tables of Cohen (1977), the regression analyses employed in this study test the hypotheses

presented with an approximately .75 chance of detecting a medium effect for variability.

As discussed above, the principle question of this investigation concerned the effect of increased variability on training outcomes. However, the present study also allows for the exploration of the relative impact of the two different manifestations of variability used here. To do this, an exploratory analysis was designed that did use analysis of covariance and followed with planned comparisons across condition. In order to isolate the effects of the two different varaibility manipulations, conditions 2 and 3 were, in the exploratory analysis, coded separately. Such coding yielded four groups for the exploratory analysis: condition (1) low variability; condition (2) scenario variability; condition (3) model competence variability; and condition (4) combined scenario & model competence variability.

These analyses were denoted exploratory for two reasons. First, even though the sample size presented here is considerably larger than most prior investigations on training interventions, the number of mean tests conducted reduces the power to detect a medium effect to only .55. Second, using six multiple comparisons across four conditions per each dependent variable means that the test to subject ratio is approximately 2 to 1. This brings the probability of a Type I error to a level higher than that

conventionally accepted as appropriate in the scientific literature. Although the increased probability of statistical error was not deemed significant enough to deter the exploratory analyses, results from these analyses should nonetheless be interpreted cautiously.

Chapter III

RESULTS

Reliability of Measurement & Intercorrelations

The reliability coefficients for all variables are on the diagonal of the intercorrelation matrix presented in Table 3-1. Internal consistency (alphas) were computed for the pre-measure of assertiveness (ASSERT), the dependent measure of reaction (REACT), and the process measure of motivation to attend (ATTENT). Alphas for these measures ranged from .75 to .89 and all were highly acceptable using Nunnally's (1967) criteria for reliable measurement.

Interrater reliability was calculated for the dependent measures of learning (LRN), reproduction (REPRO), generalization/role-play (GEN-RP) and generalization/ transfer (GEN-TRAN) and the process measure of retention (RETENT). Raters were two trained Doctoral students familiar with the training content and blind to condition. Reliabilities for each measure were calculated by having one rater rate the entire set of subjects. The second rater then randomly selected a subset of subjects across the four conditions (25% of subjects per condition) and rated those. The reliability figure reported in the diagonal is the correlation between the two raters' rating of subjects rated

TABLE 3-1
Intercorrelations and Reliabilities for All Variables
N = 72

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	-											
2. Pre-Assertiveness	.02	.89										
3. GPA	.19*	.09	-									
4. Attention	.07	.09	.03	.75								
5. Retention	.03	.09	.25*	.16	.86							
6. Reaction	.25*	-.10	.08	.38***	-.13.	.80						
7. Learning	.27**	.07	.03	.19*	.30**	.29**	.86					
8. Reproduction	-.02	-.12	-.01	-.23*	-.02	-.04	.10	.94				
9. Generalization	-.13	.03	.03	-.19*	-.03	-.04	-.09	.11	. 82			
10. Transfer	-.02	.05	.21*	.01	.00	.03	.06	-.22**	- .09	.90		
11. Low Variability	-.16	-.06	-.13	-.30**	-.15	-.19*	-.03	.43***	.11	-.24**	-	
12. High Variability -	.09	.15	.24*	.06	.08	.01	.18*	-.36***	.03	.34	-.33	

Notes: Reliabilities are on the diagonal
* < .05
** < .01
*** < .001

jointly and all are highly acceptable using Nunnally's (1967) criteria.

Several observed relationships in the intercorrelation matrix warrant highlighting. One, the intercorrelations among the five dependent measures were generally low and non-significant, with an overall average zero-order correlation of .03. An interesting exception was the -.22 relationship found between the measures of reproduction and transfer. This suggests that trainees' ability to reproduce modeled skills was inversely related to their ability to transfer skills to a novel context. Two, the intercorrelations of the pre-measures with the five dependent measures was also very low, with an average overall zero-order correlation of (.034). Three, with respect to the two process measures, motivation to attend was significantly related to all of the dependent measures except transfer. Retention was significantly related only to learning, which should not be surprising since it was the same measure given one month later.

Analysis of Pre-Measures

Separate one-way analyses of variance were conducted using condition as the dependent measure and the three pre-measures of pre-assertiveness, GPA, and gender respectively as independent variables. Results indicated that there were no significant differences for gender ($F = .667$, $p = .575$ n.s.), GPA ($F = 1.536$, $p = .213$) or pre-assertiveness ($F =$

.660, p = .565) across the four conditions. These results indicate that randomization was successful in equalizing groups. Moreover, the observed low correlations between the pre-measures and dependent measures indicated that the pre-measures in this study fit Arvey et. al's (1985) description of "worthless" covariates. Therefore, the pre-measures were dropped from further analyses.

Results of Confirmatory Hypotheses Tests

Table 3-2 presents the means and standard deviations, both overall and by condition, for all variables. While multiple dependent measures were collected in this study, the average correlation among those measures was very low (.03) justifying the use of separate univariate analyses without the necessity of a prior overall multivariate analysis such as MANOVA. Moreover, multivariate analyses would be ill-advised in this study because the sample size would render the power of such analysis well below the .80 convention recommended by Cohen (1977).

Tables 3-3 thru 3-7 present the results of the confirmatory multiple regression analyses conducted for each of the five dependent variables and the process variables. Because of their observed significant relationships to several of the dependent variables, the process measures of motivation to attend and retention were deemed potentially explanatory co-variates. Therefore, separate regressions, entering the co-variate first, were conducted for the

TABLE 3-2
Means and Standard Deviations for All Variables
N = 72 Total, 18 Per Condition

Variables	Total M	Total SD	Condition 1 Low Var (A A A A) M	Condition 1 SD	Condition 2 Med Var (A B A B) M	Condition 2 SD	Condition 3 Med Var (A A- A A-) M	Condition 3 SD	Condition 4 High Var (A A- B B-) M	Condition 4 SD
1. GPA	3.19	.34	3.12	.41	3.15	.31	3.19	.50	3.34	.28
2. Pre-Assert	3.57	.38	3.53	.37	3.64	.39	3.45	.41	3.66	.33
3. Attention	3.52	.27	3.38	.24	3.57	.25	3.58	.31	3.55	.24
4. Retention	17.22	4.70	15.94	4.85	16.33	4.83	18.67	3.24	17.94	5.45
5. Reaction	4.06	.38	3.93	.38	4.09	.47	4.16	.31	4.07	.33
6. Learning	25.82	5.01	25.50	3.94	24.06	5.99	26.28	5.14	27.44	4.51
7. Reproduction	2.90	.53	3.27	.58	3.02	.46	2.72	.29	2.58	.36
8. Generalization	3.11	.53	3.21	.55	3.00	.63	3.09	.48	3.14	.49
9. Transfer	2.85	.63	2.58	.65	2.53	.53	3.06	.47	3.22	.57

dependent measures of paper and pencil learning, reproduction, generalization and transfer. These analyses are included in the tables as well. Interpretation of Confirmatory Regression Results

Recall that two variables, low variability and high variability were entered into the regression equations and used to wholly describe the three possible conditions of variability (high, medium, low). The sign of the coefficient for each variable indicates the direction of the relationship. For example, a negative coefficient for the low variability dummy variable indicates simply whether the mean of the dependent measure scores for trainees in condition 1 is smaller than the mean of the dependent measure scores for all trainees not in condition 1. The proportion of variance in the dependent measure explained by the dummy variables is interpreted similarly to regression using standard interval level data (Cohen & Cohen, 1983).

Results of Regression on Reaction

Hypothesis one stated that increased variability was not expected to affect trainee reactions to the training program. The regression results presented in Table 3-3 support the hypothesis. Neither of the two predictors were significant. Coupled with the overall mean score observed for the reaction measure of 4.06, these results suggest that trainee reactions to the program were generally high and did not vary significantly across condition.

TABLE 3-3
Results of Regression On Reaction Measure
N = 72

Variable	Beta	R	R2	R2 Change
Low Variability	-.20	.195	.036	.036 n.s.
High Variability	-.05	.198	.039	.000 n.s.

Results of Regression on Paper & Pencil Learning

Hypothesis two stated that increased variability was not expected to affect trainee reactions to the training program. The regression results in Table 3-4 support the hypothesis. Neither of the two predictors were significant. Hence, as hypothesized, the increase in variability did not significantly detract from, or enhance, trainee paper and pencil learning. The co-variate of motivation to attend was also not signifcant and its inclusion in the equation did not significantly change the observed relationships.

Results of Regression on Reproduction

Hypothesis three stated that increased variability would be negatively associated with trainee reproduction. The regression results reported in Table 3-5 also support that hypothesis. That is, the positive coefficient for the low variability predictor indicates that the low variability condition had higher reproduction scores than those in the medium variability conditions. On the other hand, the significant negative coefficient for the high variability predictor shows that those in the highest variability condition had lower reproduction scores than those in the medium variability conditions. Using motivation to attend as a covariate in the regression equation found that it did not explain a significnat amount of variance in the reproduction measure nor did its inclusion significantly alter any of the previously discussed results.

TABLE 3-4
Results of Regression On Paper & Pencil Learning
N = 72

Variable	Beta	R	R2	R2 Change
Low Variability	.02	.03	.00	.00 n.s.
High Variability	.19	.19	.03	.03 n.s.

Results Using Co-Variate (Motivation to Attend)

Variable	Beta	R	R2	R2 Change
Mot to Attend	-.21	.19	.03	.03 n.s.
High Variability	.20	.26	.06	.03 n.s.
Low Variability	.09	.27	.07	.00 n.s.

TABLE 3-5
Results of Regression On Reproduction
N = 72

Variable	Beta	R	R2	R2 Change
Low Variability	.34	.43	.18	.18 **
High Variability	-.25	.49	.24	.05 *

* p < .05
** p < .01

Results Using Co-Variate (Motivation to Attend)

Variable	Beta	R	R2	R2 Change
Mot to Attend	-.12	.23	.05	.05 n.s.
High Variability	-.25	.42	.18	.125 *
Low Variability	.30	.50	.25	.070 **

* p < .05
** p <.01

Results of Regression on Generalization

Hypothesis four stated that increased variability would be positively associated with trainee generalization. The regression results presented in Table 3-6 do not support this hypothesis. Rather, the lack of significant coefficients for either predictor suggests that variability did not effect trainee generalization in this study. Moreover, the separate analyses including process measures as covariates added practically nothing to the prediction of generalization. The inclusion of the covariates also did not alter the relationships of the predictors to the criterion in the regression conducted without covariates.

Results of Regression on Transfer

Hypothesis five stated that increased variability would be positively associated with trainee transfer. The regression results reported in Table 3-7 partially support this hypothesis. That is, the significant positive coefficient for high variability suggests that those in the high variability condition had higher mean transfer scores than those in the medium variability conditions. However, the non-significant coefficient for low variability indicates that the mean transfer scores for those in the low variability condition was not significantly greater than those in the medium variabilty conditions. Once again, the separate analyses including process measures as covariates added practically nothing to the prediction of transfer.

TABLE 3-6
Results of Regression On Generalization
N = 72

Variable	Beta	R	R2	R2 Change
Low Variability	.14	.11	.01	.01 n.s.
High Variability	.07	.13	.01	.00 n.s.

Results Using Co-Variate (Motivation to Attend)

Variable	Beta	R	R2	R2 Change
Mot to Attend	-.17	.19	.03	.03 n.s.
High Variability	.07	.19	.03	.00 n.s.
Low Variability	.08	.21	.04	.00 n.s.

Results Using Co-Variate (Retention)

Variable	Beta	R	R2	R2 Change
Retention	-.02	.03	.00	.00 n.s.
High Variability	-.08	.04	.00	.00 n.s.
Low Variability	.13	.13	.01	.01 n.s.

TABLE 3-7
Results of Regression On Transfer
N = 72

Variable	Beta	R	R2	R2 Change
Low Variability	-.145	.245	.06	.06 n.s.
High Variability	.300	.375	.14	.14 **

** p < .01

Results Using Co-Variate (Motivation to Attend)

Variable	Beta	R	R2	R2 Change
Attention	-.05	.01	.00	.00 n.s.
High Variability	-.29	.35	.12	.12 **
Low Variability	-.16	.37	.14	.02 n.s.

* p < .05

Results Using Co-Variate (Retention)

Variable	Beta	R	R2	R2 Change
Retention	-.06	.00	.00	.00 n.s.
High Variability	.30	.35	.12	.12 **
Low Variability	-.15	.37	.14	.02 n.s.

** p <.01

The inclusion of the covariates also did not in any way alter the interpretation of the regression results on transfer measure.

Results of Regression on Process Measures

Results of the co-variance analysis using motivation to attend and regression were inconsequential and revealed essentially no change across the dependent measures. Further regression analyses presented in Table 3-8 also revealed no significant effects using retention as the dependent variable. However, when motivation to attend was analyzed as the dependent variable, there was a significant coefficient for low variability although no significant coefficent for high variability was observed. The significant negative coefficient for low variability indicates that the low variability condition reported a significantly lower level of attention than the medium conditions. However, the high variability condition means were not significantly different from the medium variability means.

Exploratory Analyses

As previously discussed, the principle question of this investigation concerned the effects of increased variability on training outcomes and the confirmatory analyses were designed to test that general hypothesis across the dependent measures. However, implicit in this study was an interest in exploring the relative impact of the two

TABLE 3-8
Results of Regression On Process Measures of
Motivation to Attend & Retention
N = 72

Criteria = Motivation to Attend

Variable	Beta	R	R2	R2 Change
Low Variability	-.32	.30	.09	.09 **
High Variability	-.04	.30	.09	.00 n.s.

** p < .01

Criteria = Retention

Variable	Beta	R	R2	R2 Change
Low Variability	-.14	.15	.02	.02 n.s.
High Variability	.04	.16	.02	.00 n.s.

different manifestations of variability used here. To do that, an exploratory analysis was designed that used analysis of variance (ANOVA), followed by planned comparisons across condition. In order to isolate the effects of the two different variability manipulations, conditions 2 and 3 were, in the exploratory analysis, coded separately. Separate univariate analyses of variance were then conducted to detect any main effects or interaction of the two manifestations of variability. Then, multiple a-priori mean comparisons were made between condition to allow an assessment of the relative standing of the four conditions. Results of the exploratory analyses, categorized by dependent variable, are found in Tables 3-9 thru 3-14, and also highlighted below.

ANOVA on Reaction

ANOVA using the reaction measure as a dependent variable revealed no significant main effect for either the scenario (F=.108, p=n.s.) or model competence (F=.653, p=n.s.) and no interaction (F=1.34, p=n.s.).

ANOVA on Learning

ANOVA using the learning measure as a dependent variable also found no main effect for either scenario (F= .225, p=n.s.) or model competence variability (F=2.66, p=n.s.) and no significant interaction (F= 1.62, p= n.s.).

ANOVA on Reproduction

ANOVA using reproduction score as the dependent measure indicated joint main effects for model competence (F= 24.86, p=.001, R2=.25) and multiple scenarios (F=3.76, p=.05, R2=.05) but no significant interaction (F=.265, p=n.s.). A-priori contrasts further supported the hypothesis by showing that group one (low variability) was significantly different from each of the other three conditions. Significant differences were also found between conditions 2 and 3 and 2 and 4 but there was no significant difference between conditions 3 and 4. Reproduction proficiency was greatest for trainees exposed to minimum variability, followed by trainees exposed to scenario variability. The two conditions that saw model competence variability, one with multiple scenarios and one with only one scenario, achieved the lowest mean scores on the reproduction measure though there was no significant difference between those two conditions themselves.

ANOVA on Generalization/Role Play

ANOVA using generalization as the dependent measure found no main effect for either model competence (F=.012, p= n.s.) or multiple scenarios (F= .460, p=n.s.), nor was there a significant interaction (F=.817, p=n.s.).

ANOVA on Generalization/Transfer

ANOVA using the transfer role play as a dependent measure revealed a highly significant main effect for model

TABLE 3-9
Results of Analysis of Variance On Reaction Measure

N = 72

Source of Variation	df	MS	F	F-prob
Model Competence Var	1	.092	.653	n.s.
Scenario Var	1	.015	.108	n.s.
Interaction	1	.190	1.340	n.s.

TABLE 3-10
Results of Analysis of Variance On Paper & Pencil Learning Measure

N = 72

Source of Variation	df	MS	F	F-prob
Model Competence Var	1	62.74	2.66	n.s.
Scenario Var	1	5.30	.22	n.s.
Interaction	1	38.12	1.62	n.s.

TABLE 3-11
Results of Analysis of Variance On Reproduction Measure.
Including a Priori Contrasts
N = 72

Source of Variation	df	MS	F	F-prob	R2
Model Competence Var	1	4.772	24.862	.001	.25
Scenario Var	1	.617	3.664	.05	.05
Interaction	1	.051	.265	n.s.	

A-Priori Contrasts

	t	t-prob
1 vs 2	1.7198	.090
1 vs 3	3.7900	.001
1 vs 4	4.7773	.001
2 vs 3	2.0702	.042
2 vs 4	3.0575	.003
3 vs 4	.9873	.327

TABLE 3-12
Results of Analysis of Variance On Generalization Measure

N = 72

Source of Variation	df	MS	F	F-prob
Model Competence Var	1	.004	.012	n.s.
Scenario Var	1	.138	.460	n.s.
Interaction	1	.245	.817	n.s.

TABLE 3-13
Results of Analysis of Variance On Transfer Measure,
Including a Priori Contrasts
N = 72

Source of Variation	df	MS	F	F-prob	R2
Model Competence Var	1	5.497	17.364	.001	.23
Scenario Var	1	.021	.067	n.s.	
Interaction	1	.122	.387	n.s.	

A-Priori Contrasts	t	t-prob
1 vs 2	.2979	.767
1 vs 3	2.5317	.014
1 vs 4	3.4253	.001
2 vs 3	2.8296	.006
2 vs 4	3.7231	.001
3 vs 4	.8936	.375

TABLE 3-14
Results of Analysis of Variance On Process Measures

N = 72

Motivation to Attend

Source of Variation	df	MS	F	F-prob	R2
Model Competence Var	1	.152	2.152	n.s.	
Scenario Var	1	.085	1.206	n.s.	
Interaction	1	.228	3.226	n.s.	

Retention

Source of Variation	df	MS	F	F-prob	R2
Model Competence Var	1	57.430	2.691	n.s.	
Scenario Var	1	6.048	.283	n.s.	
Interaction	1	12.818	.601	n.s.	

competence (F=17.36, p=.001, R2=.23). No main effect for multiple scenarios (F=.067, p= n.s.) was found, nor was there an interaction (F= .387, p= n.s.). A-priori contrasts supported the hypothesis revealing significant differences between group 4 (high variability) and groups 1 and 2. Group three (model competence variability) was also significantly different from groups 1 and 2. No significant difference was observed between groups 1 and 2 or between groups 3 and 4. Trainees exposed to differentially competent models, either with or without multiple scenarios, achieved significantly higher scores on the audio-taped generalization/transfer measure collected four weeks after the conclusion of training.

ANOVA & Variance Explained for Process Measures

It was suggested earlier that a trainee's motivation to attend to video models and retention of learning were two variables that might more precisely account for enhanced training outcomes occuring in the variability conditions.

ANOVA refuted this process variable notion, at least as measured in this study, indicating no main effects for either type of variability on either motivation to attend or retention.

Summary of Results

The results of this investigation can be summarized as follows: a) variability did not significantly effect trainee reactions to the program;

b) variability did not significantly enhance or detract from trainee paper and pencil learning of the behavioral learning points;

c) variability was negatively associated with trainee reproduction of modeled behaviors;

d) variability was not significantly associated with trainee generalization of learning points in a novel role-play;

e) high variability was associated with trainee transfer of learning points to a novel situation measured unobtrusively;

f) low variability was negatively associated with trainee attention;

g) exploratory analysis suggested that model competence variability had a more significant positive effect on trainee transfer relative to scenario or low variability exposure.

Chapter IV

DISCUSSION

Overview

The results presented here provide empirical evidence of the effects of stimulus variability applied to a modern industrial training technique. Several findings from this study are noteworthy. First, variability was found to positively affect trainees proficiency in transferring trained skills to a novel situation, outside of the training context, measured four weeks after the conclusion of training. Second, low variability with repetition was found to be the most effective strategy to enhance trainee proficiency to closely reproduce modeled behavior. Third, exploratory analyses revealed that model competence variability, in particular, was an effective strategy for enhancing trainee transfer. The following section presents a discussion of these findings and their implications. Subsequent sections discuss unexpected findings, limitations of this research and future research directions.

Major Findings

The finding that trainees exposed to more variability were superior in transferring trained assertive skills supports the contention of learning theorists that

variability should foster positive training outcomes. For example, Ellis's (1965) statement ..."if the stimuli or responses in the transfer context are different from those in the original learning context, then the greater the similarity of stimuli, the less the positive transfer and the greater the variability, the greater the transfer..." (p. 23), accurately characterizes results presented here. Further, these results are entirely consistent with Bandura's (1977) contention that it is diversity in modeling that fosters generalization and Kazdin's (1975) notion that transfer is a function of having a broad range of cues in the learning stimuli. Finally, the results are consistent with existing research, conducted outside of industrial contexts, which has found support for the value of variability in fostering positive training outcomes (Callentine & Warren, 1955; Cominsky, 1982; Duncan, 1958; Kazdin, 1975; Shore & Sechrest, 1961).

The finding that variability was negatively associated with trainee ability to closely reproduce the modeled behaviors is also consistent with learning theory and research. That is, results support the contention of learning theorists that stimulus similarity and repetition foster reproduction (Bandura, 1977; Ellis, 1965; Kazdin, 1975). Results are also consistent with existing empirical research, focusing primarily on motor skills, which indicates that the less the amount of variation within the

learning stimuli, the more frequent the learning of exact responses (Adams, 1987; Hamilton, 1943; McKinney, 1933). Recent work on the overlearning of military skills (Hagman & Rose, 1983) is also consistent with the finding that variability can detract from reproduction.

A third finding of this investigation was revealed by the exploratory analyses which suggested that trainees exposed to both positive and negative models had superior transfer of assertive skills, relative to those exposed to positive models only, regardless of whether one or multiple positive models were shown. Unlike the previous two findings, this result is not entirely consistent with learning theory or with previous empirical research. For example, it is a widely accepted tenant of behavior modification theorists that positive information is superior to negative because it makes desired points or behaviors directly perceptible (Skinner, 1938). Negative information, on the other hand, does not put the desired knowledge in direct view but simply shows what is not correct. Furthermore, it has been argued that positive examples provide more information and may be easier to assimilate than negative examples (Bourne, 1970).

Empirical evidence relevant to this issue is sparse, although one study of modeling reported superior results for positive modeling over combining positive and negative in the teaching of questioning skills for counselors (Alssid &

Hutchison, 1977). However, as discussed in Chapter I, this study was limited in several respects, most notably in evaluation criteria and the confounding of training time with treatment. Nonetheless, the results did suggest that negative examples interfered with learning and positive models alone were the most efficient training technique.

The significant finding for the combination of positive and negative models (model competence variability) reported here refutes the notion discussed above that negative or non-exemplary information is dysfunctional in a training context. That is, the argument that non-exemplary information will interfere with learning and detract from efficient instruction was not supported here. Rather, exploratory analyses revealed that trainees exposed to both positive and negative models not only demonstrated superior performance on the unobtrusive transfer measure, but did so with no corresponding drop in their learning of the principles as measured by a paper and pencil learning test. Therefore, these results provide support for a contention that non-exemplary information has value in training contexts and that the traditional bias against such information should perhaps be reconsidered.

One other significant finding of this investigation was that those trainees in the low variability condition reported lower attention to the modeling stimuli. This is consistent with ideas of stimulus variability advocates

(e.g. Ellis, 1965) who have suggested that excessive repetition can cause attention to wane. In this investigation, for example, it seems likely that the lower attention scores reported were a function of the fact that trainees exposed to four consecutive identical videos simply got bored and consequently, relative to other more variable conditions, had lower attention. The findings of this study have several significant implications for the understanding, investigation and practice of modeling-based training. First, conceptualizations of modeling have generally suggested a fairly straightforward imitation effect from exposure to modeling stimuli. Such a simplistic imitation view of modeling posits that the observer simply reproduces the direct behavior that is observed. The results found here do provide some evidence for such effects, but also support recent contentions that the modeling process is considerably more complex (Decker, 1980; Gioia & Manz, 1985; Manz & Sims, 1986). Decker (1980, 1982) for example, has found that the effect of different learning points can extend beyond simple imitation and have an impact on rule learning and generalization. Manz & Sims (1986) concluded that models intended to influence a single behavior actually evoked behavioral changes very different than those specifically displayed by the model. The findings of this study provide further support for the contention of Manz and Sims (1986) that the modeling process should be viewed as a

complex phenomenon including the possibility of multiple behavioral and affective outcomes that go beyond simplistic imitation interpretations. Consistent with the discussion above, a second implication of the empirical findings presented here concerns the importance of matching trainee stimuli to the desired learning objectives. For instance, if the training objective is indeed to induce imitation of very specific behaviors or motor skills, then these results suggest that repeating purely effective model scenarios would be the optimal training strategy.

Conversely, if the objective is to inculcate generalizable rules that will be transferred to the work or social context in non-identical ways, then varying the stimuli would be appropriate. Since generalization and transfer of skills are the paramount concerns in industrial training (Goldstein, 1986) the value of variability is readily apparent.

While the immediate goal of this research was to examine the effects of increased variability on several training outcomes, implicit was a second goal of finding practical ways to increase the effectiveness of the behavior modeling training technique. Results observed in the present study meet this goal and suggest practical prescriptions for those concerned with the design and evaluation of behavior modeling training.

First, the superior transfer performance of the trainees exposed to both positive and negative models suggests that including scenarios depicting negative models, along with existing positive models, would be well directed. Filming incompetent models in existing scenarios would add little to training cost and, supported by results found here, should positively affect transfer with no negative effects on learning or trainee reactions. Of course, the idea of mixing positive and negative examples is certainly not new. In fact, writers as far back as Aristotle and Plato put forth the notion of "dialectical inquiry" which, simply stated, argued for the value of exploring both a thesis and an antithesis for enriching learning that could be used in other contexts. In addition, instructors intuitively including examples of ways not to do something (e.g. how not to swing a golf club, how not to interview an applicant) is not uncommon. Nonetheless, one of the persistent criticisms of training and development design and practice is that it is too often based on trainer intuition, and too infrequently supported by empirical results of the sort presented here (Campbell, 1971).

The inverse relationship between reproduction and transfer found in this study also provides empirical evidence relevant to training evaluation. Training authors have perennially argued that reaction and paper and pencil learning criteria are, by themselves, inadequate criteria to

assess industrial training outcomes (Campbell, 1971; Goldstein, 1980; Kirkpatrick, 1967; Wexley, 1984). Kirkpatrick's (1967) notion of a hierarchy of four levels of evaluation; reaction, learning, behavior, results; is widely known and accepted though behavior and results have been infrequently assessed.

The results of the present study clearly document the critical need to both obtain measurement of different levels of evaluation and also to understand the relationship between those levels. To further illustrate the importance of this point, consider the conclusions of an evaluator who might have relied solely on reaction and learning criteria in the present study. Such an evaluator would have concluded that the program was uniformly successful across condition and that there were no significant effects of the variability manipulations. In light of the significant differences observed on the reproduction and transfer measure, such a conclusion would have been seriously deficient and potentially misleading for subsequent training prescriptions. Moreover, even the use of a reproduction criterion as the ultimate measure (as is often done in behavior modeling programs) would have neglected the differential effects on transfer, thus perpetuating the assumption that repetitive modeling is the superior approach.

Unexpected Findings

While the majority of results of this investigation were consistent with expectations, the non-significant findings for the simulated video-taped generalization measure were bewildering. Although no conclusive statements can be made, one explanation may have been that the anxiety of being filmed was an important factor and suppressed the superior generalization potential hypothesized for those in the high-variability conditions. That is, perhaps only those capable of handling the pressure of being filmed performed to their level of learning which, in effect, would wash out a main effect for generalization. It may also have been that the simulated role play may not have induced the same level of motivation to perform as the transfer situation and this lack of motivation suppressed any differences across condition. That is, in the generalization role play the trainees knew that no significant consequences, either positive or negative, were contingent on their performance. On the other hand, in the transfer role play, trainees perceived that a failure to act in an assertive manner could cost them money they did wish to spend. This difference in the saliency of consequences for performance may have partly accounted for the observed differences between the two otherwise similar role play situations.

Study Limitations

Although the present investigation included random assignment and multiple dependent measures, certain study limitations still warrant caution in interpreting results. The study employed a student sample exposed to a relatively short training program and the potential limitations of the study center around the external validity of results found here, considering the particular sample and stimulus used.

With respect to the student sample, it is argued here that the trainee sample presents no extreme threats to external validity primarily because observer characteristics should not dramatically differ across contexts. For example, one frequent criticism of student trainee samples is that they have inherently less motivation to learn. That is, the argument goes, student trainees typically know that they will be given course credit regardless of their training performance and often times are trained in simulated topics with no immediate interest or applicability for them (e.g., conducting performance appraisal interviews). Consequently, students are not motivated to learn and hence do not adequately represent an industrial training population that may need training skills to perform their job better or may be given a post-training test monitored by their superior.

In this investigation, the training topic was rated by the trainees as having high utility for them, and they

volunteered for the program. Therefore, there seems little reason to believe that a student trainee's motivation to learn would be any less than an industrial trainee who selected a particular program. Although it is clearly an empirical question, there are no other readily apparent attitudinal or affective differences that would be expected between student and industrial subjects with the possible exception of ability to learn or intelligence.

The potential superiority of students with respect to ability to learn is an unresolved issue. On the one hand, it might be argued that college admission requirements generally insure that students will be above average in ability to learn. Clearly, the extent to which such differences exist and affect training outcomes limits the external validity of this study.

Hovland (1951) found that the effectiveness of persuasive arguments was moderated by the intelligence of the listeners. Simple, one sided arguments were found to be most persuasive for those below average in intelligence. However, more complex, two sided arguments were found most persuasive for listeners above average in intelligence. Based on that evidence it is conceivable that increased variability might be most effective for observers with above average intelligence. Low intelligence trainees might find the increased variability confusing and be unsure as to what behaviors were desired. High intelligence trainees, on the

other hand, might benefit from the increased variability as reported here. In any event, intelligence level may be a boundary condition of findings presented here although, to the extent that industrial trainees are college trained, it should not be an issue.

The research stream of Decker and colleagues (1980, 1982, 1986) is also relevant to this issue. Examination of Decker's three studies indicates that the pair of studies (1982, 1986) were essentially investigating the same phenomena as that of the 1980 study. The only significant difference between the studies was that the 1980 study used a college student sample and the other two a first line supervisor sample. In each case, results of the field study replicated results found with college students. Taken together, these studies provide empirical evidence in support of the contention that the use of students in a non-industrial context should not lower the external validity of this research. Provided the modeling stimulus has a low baseline rate of occurrence in the subject population, includes all of the attentional processes and is of general interest to the subject population, it seems that results can be generalized from students to industrial supervisors.

Fontenelle, Phillips, and Lane (1985) make the case that generalization of the results of an experiment beyond the laboratory requires that researchers consider the representativeness of both subjects and stimuli. They argue

that while researchers are often aware of the representativeness issue for subjects, it is too often ignored with respect to stimuli. In statistical design terms this concerns the difference between fixed-effect and random-effect designs. This study was a fixed effects design, meaning that the levels of the independent variable were selected arbitrarily and systematically in contrast to randomly or unsystematically. This means that statistical generalizations are limited to the treatment effects observed with these particular treatment conditions. In this study, assertive skills modeled by college students were chosen as the stimuli because it was felt that such skills represented relevant learning content for both students and managers and that students would relate better to models similar to themselves. However, since too few stimuli were used to allow statistical generalization, this is really a case of "logical" generalization. And since generalization of this type is based on the judgement of the researcher it is, by definition, subjective. When logical generalization is used, the possibility that results may be a function of extraneous factors associated with the particular stimuli can not be conclusively ruled out. For example, in this study it is conceivable that perhaps the particular student models induced the effects and that manager or supervisor models displaying the same learning points would not replicate results. Similarly, it is

conceivable that assertiveness skills themselves induce certain effects and that the effects for variability would not be replicated for other types of skills.

Finally, it might be argued that the training stimulus in this study lacks generalizability to industrial training, because it did not include role-playing, an element almost always included in idustrial versions of modeling-based training. A role playing component was not included in this study for two reasons. One, several of the dependent measures were role-plays themselves and it was felt that differential practice or learning effects might contaminate the results. Two, the focus of this research was specifically on the modeling component and, thus, an attempt was made to isolate the modeling from the othere aspects of modeling-based training. Nonetheless, the generalizability of these results to industrial based training is a critical issue and one that warrants additional empirical investigation.

The acknowledgment and discussion of limitations suggests potential boundary conditions (Fromkin & Streufert, 1976) of this investigation that will hopefully direct future research in this area.

Future Research

A persistent criticism of industrial training and development is that far too much of what is commonly accepted and practiced is based on either intuition or early

learning research that focused on simple motor skills (Campbell, 1971; Goldstein, 1986). The present study empirically examined the effects of increasing variability in the modeling component of behavior modeling training. The literature reviewed and the results reported here suggest several directions for future research on modeling in particular and industrial training in general.

With respect to future investigation of behavior modeling training, Decker (1980) and Manz and Sims (1986) point out that even though field results of modeling-based training have generally been positive, there is a pressing need for more research on the influence of the components of modeling. A number of research questions involving model behaviors, model display characteristics and observer characteristics relevant to modeling, clearly warrant investigation like that conducted here.

For example, Decker and Nathan's (1985) summary of the research on effective model behaviors suggested that greater modeling will occur when the model's behavior is: (1) distinctive, (2) meaningful to the observer, (3) not too complex, and (4) is observable. While those four criteria seem logical enough, there is also considerable ambiguity as to how they might be operationalized and enhanced. That is, what characteristics of a model's behavior would make it more distinctive, more meaningful and so on? Mann and Decker (1984) found that distinctiveness could be enhanced

by exaggerating the key behaviors and by including written labels or descriptions of the behavior in the modeling display. Walter (1976) demonstrated that dramatized behavioral modeling produced greater effects than naturally occurring or normal behaviors. Results of the present study suggest that model competence variability may enhance distinctiveness. More research of this type would be beneficial to further the effectiveness of modeling principles in training.

One interesting question closely related to the present research involves whether a model should initially show uncertainty and apprehensiveness about applying the skill (to be more like the trainees), and then demonstrate confidence and competence with it. Use of this coping and mastery sequence for modeling has proven to be significantly more effective than the mastery mode alone in reducing snake avoidance (Kazdin, 1973; Meichenbaum, 1971). As Fox (1985) notes, this refinement could also be useful in industrial skill training particularly when trainee anxiety is an important consideration.

Another question relates to the relative effectiveness of filmed or video-taped modeling, versus live modeling. Clearly, the former can provide important advantages with respect to cost, control, and convenience, but results on its relative effectiveness are inconclusive. Mann (1972) found that real life observation was somewhat more effective

than video tapes of participating subjects in reducing test anxiety. On the other hand, Walter (1976) found that highly dramatized behavior on video was the superior technique. This debate could benefit from research conducted on, for example, live vs. video taped managers in an industrial training context. Future research should not be restricted to the modeling component of behavior modeling. For example, issues concerning the design and rehearsal of learning points, role-playing and feedback in behavior modeling all remain relatively unexplored, although some work has been done.

In a series of experiments, Decker (1980, 1982, 1984) examined the effects of different symbolic coding stimuli (learning points) on retention in behavior modeling training. Three types of learning points were described: summary label, rule oriented, and behavioral (Decker, 1984; Gerst, 1971). Each type had a different effect on behavioral reproduction and generalization to a novel setting. Specifically, Decker's research revealed that: (1) most learning points enhance behavioral reproduction and generalization when compared to a no-learning point condition; (2) summary label learning points do not enhance behavioral reproduction, but do enhance generalization; (3) rule-oriented learning points did contribute to behavioral reproduction and also enhanced generalization; and (4) behavioral learning points enhanced reproduction better than

other learning points, but were less effective in facilitating generalization. Decker and colleagues (Decker, 1980; Hogan, Hakel & Decker, 1986) have also found that allowing the observers to participate in the development of the learning points enhanced trainee generalization. More research exploring the match between learning points, type of training content and trainee characteristics would be well-directed.

With respect to role-playing, no research in the training literature could be found that investigated enhancements to this widely used training technique. It seems plausible that the effectiveness of role-playing may be contingent on such factors as whether the role player is given the choice to participate or not, and the nature of the reinforcement for participating.

With respect to feedback, several studies have been conducted on the value of taped feedback (audio or video) and the results are inconclusive. Prout (1974) found that overt rehearsal with videotape playback was more effective than overt rehearsal without it. On the other hand, Gormally, Hill, Otis and Rainey (1975) found that the addition of videotaped playback did not add significantly to treatment effects. Some authors have suggested that videotaped feedback is highly preferable because it can provide the most specific informative feedback possible about nonverbal behaviors. Behavior modeling trainers

typically focus on verbal behaviors often overlooking subtle non-verbal feedback that a video tape could supplement. Others have suggested that video feedback may induce high trainee anxiety, particularly for trainees learning new behaviors or highly sensitive about their performance (Fox, 1985).

Another promising direction for future research involves the identification and understanding of observer characteristics which may affect modeling outcomes. While it seems intuitive that different people would respond differently to modeling, and that some model scenario manipulations would affect some more than others, research on these issues is not well developed for industrial training contexts. However, empirical evidence from studies in counseling and education provides a good starting point for the exploration of observer differences.

For example, in a study by Candler and Goodman (1977) observers rated as highly authoritarian had a significantly greater tendency to imitate models. Several authors have found that internal locus of control subjects demonstrate significantly greater attention to, awareness of and utilization of vicariously presented information (Stone & Jackson, 1975; Primo, 1974). Kloba (1975) showed that observers rated as independent rather than dependent tend to imitate more readily, especially high status models (Kloba, 1975). Finally, an observer who is unsure about the

appropriateness of his or her behavior is more likely to attend to a model (Kanfer & Goldstein, 1980).

One interesting research program on observer characteristics was conducted outside of a training context by Weiss and colleagues (Weiss, 1977; Weiss & Nowicki, 1981). Specifically, Weiss (1977) examined the effect modeling plays in the socialization of persons as they move into organizations. He hypothesized that modeling is more pronounced for low self-esteem observers and, therefore, self-esteem moderates the relationship between model characteristics and the model/observer behavior similarity. He found strong support for the moderating influence of self-esteem in that perceived supervisor success was significantly and positively correlated with similarity between the supervisor and the subordinate behavior after socialization for low self-esteem subjects. Supervisor success was not correlated with similarity for the high self-esteem subgroup. Furthermore, Weiss (1977) suggests that because external incentives motivate behavior for people with specific value or personality profiles, while other people are motivated by intrinsic satisfaction associated with the correct behaviors, the former group will be more likely to imitate models on the basis of characteristics which convey extrinsic reward-probability information. the latter group will be more influenced by model attributes.

Weiss and Nowicki (1981) looked at the interactive effects of model task performance and observer field dependence on the observers' adoption of model's expressed attitudes. The results of that study show that the influence of information on task attitudes is an interactive function of model and observer characteristics. They found that the task attitudes of field dependent subjects were significantly influenced by the expressed attitudes of a model and that the model's competence did not matter. Field dependent subjects were just as likely to adopt the attitudes of a low performing model as the attitudes of a low performing model as the attitudes of a high performing model. The results also showed that field independent observers responded to the models' attitudes but were selectively influenced. They were willing to accept the attitudinal information of the component model but were quite unwilling to accept the information of the incompetent model. It seems clear that this stream of research begun by Weiss has potential to understand the differential effectiveness of modeling for different individuals. More research in this line would do much to enhance our understanding of modeling and useful for applying our knowledge of modeling to training contexts.

Another empirical question that arises from modeling research concerns how broadly the technique can be applied. That is, how observable do behaviors have to be to enable

effective application of modeling based training. It has been suggested that many skills are not suited to observational learning because important dimensions of the skills cannot be made visible to trainees (Adams, 1987). However, Carroll and Bandura (1982) conducted an experiment whereby they made observable some parts of a model's movement that would normally be out of view. A complex arm movement was modeled, and a television system was used to make the unobservable sides of the movement observable. Significant observational learning took place. Nonetheless, it seems reasonable from observational learning, even when typically unobservable features of the skill are made visible as Carroll and Bandura (1982) did, is limited. More research that explores the limits of what can, and cannot be effectively modeled, particularly with respect to social and interpersonal skills relevant to management, would be useful to training researchers and practitioners alike.

With respect to the utility of behavior modeling training, one issue raised by McGehee and Tullar (1978) is that no studies available at that time had completed a cost-benefit analysis of modeling-based methodology versus other training. They noted that while, even then, there was ample evidence that behavior modeling is effective at teaching people new behaviors, there was not convincing evidence in the industrial training literature that it is more effective than other training methods. An updated review of the

literature of industrial training indicates that ten years after the McGehee and Tullar article, there is still no compelling evidence of modeling's relative advantage. Russell and Mayer (1985) point out that to rigorously compare training programs or techniques three criteria must be met: (1) the training content must be identical; (2) the conditions of training must be identical, i.e., length of training, reasons for participation, and nature of instruction; and (3) the training evaluation must cover the entire content of the training. To date, studies comparing behavior modeling to other techniques have not thoroughly met all three criteria and comparative evaluation research to demonstrate the relative effectiveness of behavior modeling training would be well-directed.

A final direction for research that emerges from the present investigation concerns the value of combining negative information with positive information in training presentations. It was theorized in this study that the mixture of effective and ineffective would increase the distinctiveness of modeled behaviors and result in enhanced trainee outcomes. It was also expected that the addition of negative examples provides a contrastive element, which enhances retention of images or scripts which aid subsequent use and demonstration. Although the present results are consistent with such explanations, they are not conclusive. Further research is required to isolate the specific factors

responsible for the demonstrated superiority of the varied model competence conditions.

It may be that the effectiveness of varied competence models may be most beneficial with certain types of behaviors. For example, very subtle behaviors that are not naturally distinctive (e.g., active listening, verbal assertiveness). In addition, there may be certain conditions under which one would want to use positive models only. For example, a particularly sensitive group that is learning difficult new behaviors (e.g., sexist autocratic male managers learning to communicate more effectively with female colleagues). The combination of effective and ineffective models may also have implications related to more complex psychological phenomena. Manz and Sims (1986) have suggested that by exposing a subject to a model, we may in fact be causing the individual to create a new cognitive script (Abelson, 1981) that will guide the behavior of the individual when it is evoked by appropriate future situations. More research is needed to explore the relationship of modeling to complex psychological phenomena such as scripts and schema.

Conclusion

American organizations spend over forty billion dollars on training and development each year (Rus-Eft & Zenger, 1985). However, it is frequently lamented that the existing literature on training and development offers little of

value to trainers concerned with improving the outcomes from their training efforts (Gagne, 1962; Wexley, 1984). Improving training and development requires more diligent and creative application of relevant learning theory. This investigation will hopefully contribute to the improvement of training practice and help stimulate further research designed to better understand the training process.

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APPENDICES

APPENDIX A

LEARNING POINTS OF ASSERTIVE COMMUNICATION

APPENDIX A

Learning Points of Assertive Communication

1. Look directly at the focal person with head erect. Speak clearly and to the point with no dramatic changes in voice tone.

2. Use Self-Disclosure (be honest about your feelings and needs and accept responsibility for them. Use "I" statements). Avoid fabricating "better" reasons for your feelings.

3. Use Broken Record (be persistent in a request or answer with calm repetition). Avoid softening statements, qualifiers, temper, or trying to give more persuasive reasons for your feelings.

4. Use Fogging (acceptance of manipulative or sidetracking statements by calmly acknowledging the probability that there may be some truth in the statement but this does not change your feelings. Avoid sarcasm, aggression, critical attacks.

5. Use Negative Assertion (acknowledge and accept your feelings and faults without apologizing for them). Avoid angry denials, retaliation, name calling.

6. Check for Closure and two way understanding of outcome or compromise.

APPENDIX B

MODEL SCRIPTS

APPENDIX B

MODEL SCRIPTS

Positive Dealer Problem Script (A)

Model = Scott

Scott: Good Morning
Ty: Good Morning
Scott: Hi, my name's Scott Snell. I brought my car in a couple of days ago to get my brakes worked on under warranty and when I got my car back the brakes squealed really loudly and I really don't want brakes on my car that squeal.
Ty: Well, I'm sorry Mr. Snell but there's really nothing we can do about that. Those are standard brakes and quite often they squeal that way.
Scott: Well, I am sure they might squeal that way from time to time, but when I brought my car in here the brakes didn't squeal and when I got it back they did. I really don't want brakes on my car that squeal.
Ty: As I said before, really there is nothing we can do about that.
Scott: Could you tell me the name of your service manager and where I might find him?
Ty: I am the service manager here, my name is Ty.
Scott: Well, Ty, I don't know much about brakes or why they might squeal but all I know is when I brought my car in here everything was fine in terms of the squealing and when I get it back they're squealing and I don't want brakes on my car that squeal that way.
Ty: Well, Mr. Snell, do you have a work receipt on this?
Scott: Yes I do, right here (hands Ty the work receipt).
Ty: (Reading work receipt) It says here this work was done last Wednesday.
Why didn't you bring this to our attention last Wednesday or Thursday?
Scott: Maybe I should have, but my car is here now and I want brakes on my car that don't squeal.
Ty: It also says that the brake cylinders on all four wheels were replaced. Here's what probably happened. The mechanic probably found a bit of brake leaking brake fluid on the brake shoes and decided to replace all four cylinders. It's something he didn't have to do, but something we like to do to insure our customers driving safety. And by the way, you weren't charged for it.

Scott: Well, I am sure what your are saying is true. But when I brought my car in here the brakes didn't squeal. It's that simple. When I got my car back they did squeal. I don't want my car in that condition.

Ty: As I mentioned, these are replacement brakes that the factory provides us. They are much harder and better than the original brakes. consequently, they might squeal a little bit.

Scott: I really don't doubt that you might have trouble from time to time with your factory replacements, but I don't see that as my problem. When I brought my car in here the brakes didn't squeal and now they do. I want brakes on my car that don't squeal.

Ty: But these are brand new brakes that we installed for nothing. We didn't have to do it, we did it as a courtesy to you. We just like to take care of our customers driving safety.

Scott: Well, that is very courteous on your part. But, like I said before, I don't want my car having squealy brakes.

Ty: C'mon! If we put the original brakes back on your car they won't last half as long as the new brakes we just installed. Does that make any sense?

Scott: I can understand your feelings, and maybe I'm not making any sense--maybe this isn't a rational decision--these brakes might last longer but I don't want them on my car if they are going to squeal that way.

Ty: Can you leave the car with me this afternoon?

Scott: If I do will you fix my brakes?

Ty: If you leave the car with me, I'll make sure the brakes get fixed.

Scott: When can I get my car back?

Ty: We'll have your car by 10:00 tomorrow morning.

Scott: That would be great. I really appreciate your help.

MODEL SCRIPTS

Negative Dealer Problem Script (A-)

Scott = Model

Scott: I had my brakes fixed under warranty here a few days ago and now the brakes squeal loudly.

Ty: There's nothing we can do about that. Those are the standard brakes and they often squeal that way.

Scott: I don't think all standard brakes squeal -- I've had them before, and so have friends who had them and they didn't squeal. It's embarassing to have loud squealing brakes.

Ty: Sir, we really can't do anything about that.

Scott: You'd better or I will be talking to your service manager.

Ty: I am the service manager, and my name is Ty.

Scott: Well, Ty, I am sorry and don't want to create a big hassle but I know that things don't always get done perfectly in these garages and I think something is up with the way my brakes squeal now. They didn't squeak when I brought them in, you know.

Ty: Do you have the work receipt?

Scott: Yes, I do and the lazy mechanic that worked on it is standing right over there. It took him two days over schedule, you know.

Ty: It says the repair was done last Wednesday morning. You should have brought it back either Wednesday or Thursday. We can't be sure the repairs are the cause of the squealing brakes.

Scott: Look, I am sorry I didn't have time to bring it in right away. I probably should have but I had other commitments at my sales office that took priority. Isn't there some way I can get my brakes fixed so they don't squeal? My boss says I should do something about it.

Ty: It also says on the work sheet that the brake cylinders were leaking and were fixed. So here's what happened. The mechanic probably found a little brake fluid on the brake shoes and decided to replace them to give you better brake performance. He didn't have to, but we like to make sure each car we rejpair is completely safe for our customers. By the way, we didn't charge you for it.

Scott: Well I don't what really happened but my brakes squeal now and its loud and irritating, you should hear them.

Ty: Well, as I mentioned, you have the standard replacement brakes that the factory provides us. Believe me they are harder and last longer than the original ones on your car. Consequently, they may squeal a little.

Tim: Wow, You are leaving me in a bad situation ----.
(4) 1 2 3 4 5

5 = That may be. I can see you're in a bad situation. But I was scheduled off, made plans and won't be available tomorrow.

3 = No I can't come in but the situation isn't that bad anyway. Couldn't you get X to work or perhaps talk to Greg -- he is your problem.

1 = I'm sorry you are in this spot. But it is not me that is leaving you in this situation and I won't come in because (any new reason).

Tim: Well that's pretty unreliable -----, who am I going to get to work?
(5) 1 2 3 4 5

5 = It may seem unreliable to you and I am not sure who you might get to work. But I was scheduled off and since I have made plans I just won't be available tomorrow.

3 = Who have you tried? There are a lot of people who might be able to work if if you call them

1 = It is not unreliable -- it's not my problem

Tim: I don't understand the deal this time -----, you have always been available before
(6) 1 2 3 4 5

5 = That's true, I have been. But this time I made plans during my scheduled off time and I won't be available tomorrow

3 = I know and I think it is someone else's turn.

1 = I'm sorry but even though I have always covered for you in the past I can't this time (gives new reason or adds to old). This time pick on somebody else.

Tim: If you help me out, I could see that you get Saturday & Sunday off
(7) 1 2 3 4 5

5 = I am sure you would and I appreciate the offer. But the plans I have made are for the days I was orignially scheduled off (including tomorrow) and I won't be available then.

3 = But my plans are not for those days -- they are for tomorrow and the next day, when I was scheduled off.

Scott: Would, you like squealing brakes on your car. My girlfriend hates it.

Ty: These are brand new brakes that we installed on your car for nothing. We didn't have to do that, we did it as a courtesy to you. We just like to take care of our customer's driving safety.

Scott: Maybe you're right, but what about putting my old brakes back on, they didn't squeal.

Ty: Come on buddy, if we put the original brakes back on your car they won't last half as long as the new ones. That doesn't make any sense.

Scott: Don't give me that, nothing in this situation makes any sense - new brakes squealing more than old brakes. I think the mistake I made was bringing it here.

Ty: In the long run, you'll thank us -- now is there anything else we can help you with.

MODEL SCRIPTS

Positive Car Loan Script (B)

Model = Scott

Ty : **Boy, am I glad to see you. I wasn't sure you were coming to class today. I've got a real problem and was afraid I couldn't get anyone to help me out.**
Scott: What's the problem?
Ty: **I need to use your car this afternoon.**
Scott: Umm. That is a problem, but I don't want to lend out my car this afternoon.
Ty: **Why not?**
Scott: I agree you need it, but I just don't want to lend out my car today.
Ty: **Do you have someplace to go?**
Scott: I may want it myself, Ty.
Ty: **When do you need it? I will make sure to have it back in time.**
Scott: I am sure you would, but I just do not want to lend out my car today
Ty: **Whenever I asked to borrow your car, you always lent it to me before.**
Scott: That's true, I did, didn't I?
Ty: **Why won't you lend it to me today? I always took care of it before.**
Scott: That's true, Ty and I can see you are in a jam. But I just don't want to lend out my car today.
Ty: **Look, I am a good driver and I have never done anything to your car before.**
Scott: That's true, Ty, I just worry when I lend my car out and I don't want to go through that hassle today.
Ty: **You know I won't damage your car.**
Scott: You won't. I know that and it is probably dumb that I feel this way but I do.
Ty: **So why won't you lend me your car if its dumb?**
Scott: Because I don't want to have to worry.
Ty: **But you know I won't do anything wrong.**
Scott: You're right Ty. It's not you, it's me that is the problem. I just worry when I lend my car out so I am not going to
lend it out.
Ty: **Okay, I guess I can understand how you feel. I suppose I might feel the same way if I had a car and someone asked to borrow it.**
Scott: Thanks for understanding my feelings.
Ty: **Yah, I guess I'll see if I can get a car from Pete or else get a ride. See ya ... probably at Pete's party on Saturday.**
Scott: Bye. See ya there

MODEL SCRIPTS

Negative Car Loan Script (B-)

Scott = Model

Ty : **Boy, am I glad to see you. I wasn't sure you were coming to class today. I've got a real problem and was afraid I couldn't get anyone to help me out.**

Scott: What's the problem?

Ty: **I need to use your car this afternoon.**

Scott: Oh. I'm sorry but I don't think I should loan my car out today.

Ty: **Why not? Do you have someplace to go?**

Scott: Well, not exactly, but I just think it would be better if I didn't lend it out today, you know? I may want it sometime myself.

Ty: **When do you need it? I will make sure to have it back in time.**

Scott: How can I be sure of that Ty, besides you're sort of reckless and that's an expensive car, you know.

Ty: **Wow, what's the big deal? Whenever I asked to borrow your car, you always lent it to me before.**

Scott: Not always, besides my Dad doesn't like me lending out a car he holds the loan papers on

Ty: **Aw come on, Scott, Why won't you lend it to me today? I always took care of it before.**

Scott: I don't know Ty, anything could happen and I am getting sick of you bugging me about it, it's my car isn't it.

Ty: **Look, I am a good driver and I have never done anything to your car before.**

Scott: I am just worried that there is always a first time and you are a bit heavy footed I hear.

Ty: **You know I won't damage your car.**

Scott: Look the car isn't running that well lately anyway.

Ty: **But you know I won't do anything wrong.**

Scott: Listen, I have given you a bunch of reasons why I don't want you to borrow my car, now will you get off it and stop bugging me about it.

Ty: **Well, thanks a lot. All I know is if I had a car and you wanted to borrow it you would have it in a second. But forget about it, I'll try to get a car from Pete or get a ride -- just forget about it I am sorry I asked.**

Scott: You know Pete's car is broken down and there's no way you can get a ride this late. Take the car, but try to have it back by 8:00 O.K.

Ty: **Gotcha. I really appreciate it Scott and I'll be very careful don't worry. Thanks a lot.**

Scott: Yea, right.

APPENDIX C

PRE-MEASURE SURVEY

APPENDIX C

Pre-Measure Survey

Directions: This section of the survey asks that you please provide some background demographic data.

1. Sex M F

2. GPA _____ (Please be as precise as possible).

The following inventory is designed to provide information about the way in which you express yourself. Please indicate on the 5-point scale how appropriate you think each item generally is. Your answer should reflect how you generally express yourself in the situation. Please circle your choice.

		Almost Always or Always	Usually	Sometimes	Seldom	Never or Rarely
1.	Do you ignore it when someone pushes in front of you in line?	1	2	3	4	5
2.	When you decide that you no longer wish to date someone, do you have marked difficulty telling the person of your decision?	1	2	3	4	5
3.	Would you exchange a purchase you discover to be faulty?	1	2	3	4	5
4.	If you decided to change your major to a field which your parents will not approve, would you have difficulty telling them?	1	2	3	4	5
5.	Are you inclined to be overapologetic?	1	2	3	4	5
6.	If you were studying and if your roommate were making too much noise, would you ask him to stop?	1	2	3	4	5
7.	Is it difficult for you to compliment and praise others?	1	2	3	4	5
8.	If you are angry at your parents, can you tell them?	1	2	3	4	5
9.	Do you insist that your roommate does his fair share of the cleaning?	1	2	3	4	5
10.	If you find yourself becoming fond of someone you are dating, would you have difficulty expressing these feelings to that person?	1	2	3	4	5
11.	If a friend who has borrowed $5.00 from you seems to have forgotten about it, would you remind this person?	1	2	3	4	5
12.	Are you overly careful to avoid hurting other people's feelings?	1	2	3	4	5
13.	If you have a close friend whom you parents dislike and constantly criticize, would you inform your parents that you disagree with them and tell them of your friend's assets?	1	2	3	4	5
14.	Do you find it difficult to ask a friend to do a favor for you?	1	2	3	4	5
15.	If food which is not to your satisfaction is served in a restaurant, would you complain about it to the waiter?	1	2	3	4	5
16.	If your roommate without your permission eats food that he knows you have been saving, can you express your displeasure to him?	1	2	3	4	5
17.	If a salesman has gone to considerable trouble to show you some merchandise which is not quite suitable do you have difficulty in saying no?	1	2	3	4	5
18.	Do you keep your opinions to yourself?	1	2	3	4	5

		Almost Always or Always	Usually	Sometimes	Seldom	Never or Rarely
19.	If friends visit when you want to study, do you ask them to return at a more convenient time?	1	2	3	4	5
20.	Are you able to express love and affection to people for whom you care?	1	2	3	4	5
21.	If you were in a small seminar and the professor made a statement that you considered untrue, would you question it?	1	2	3	4	5
22.	If a person of the opposite sex whom you have been wanting to meet smiles or directs attention to you at a party, would you take the initiative in beginning a conversation?	1	2	3	4	5
23.	If someone you respect expresses opinions with which you strongly disagree, would you venture to state your own point of view?	1	2	3	4	5
24.	Do you go out of your way to avoid trouble with other people?	1	2	3	4	5
25.	If a friend is wearing a new outfit which you like, do you tell that person so?	1	2	3	4	5
26.	If after leaving a store you realize that you have been "short-changed," do you go back and request the correct amount?	1	2	3	4	5
27.	If a friend makes what you consider to be an unreasonable request, are you able to refuse?	1	2	3	4	5
28.	If a close and respected relative were annoying you, would you hide your feelings rather than express your annoyance?	1	2	3	4	5
29.	If your parents want you to come home for a weekend but you have made important plans, would you tell them of your preference?	1	2	3	4	5
30.	Do you express anger or annoyance toward the opposite sex when it is justified?	1	2	3	4	5
31.	If a friend does an errand for you, do you tell the person how much you appreciate it?	1	2	3	4	5
32.	When a person is blatantly unfair, do you fail to say something about it to him?	1	2	3	4	5
33.	Do you avoid social contacts for fear of doing or saying the wrong thing?	1	2	3	4	5
34.	If a friend betrays your confidence, would you hesitate to express annoyance to that person?	1	2	3	4	5
35.	When a clerk in a store waits on someone who has come in after you, do you call his attention to the matter?	1	2	3	4	5
36.	If you are particularly happy about someone's good fortune, can you express this to that person?	1	2	3	4	5
37.	Would you be hesitant about asking a good friend to lend you a few dollars?	1	2	3	4	5
38.	If a person teases you to the point that it is no longer fun, do you have difficulty expressing your displeasure?	1	2	3	4	5

		Almost Always or Always	Usually	Sometimes	Seldom	Never or Rarely
39	If you arrive late for a meeting, would you rather stand than go to a front seat which could only be secured with a fair degree of conspicuousness?	1	2	3	4	5
40.	If your date calls on Saturday night 15 minutes before you are supposed to meet and says that she (he) has to study for an important exam and cannot make it, would you express your annoyance?	1	2	3	4	5
41.	If someone keeps kicking the back of your chair in a movie, would you ask him to stop?	1	2	3	4	5
42.	If someone interrupts you in the middle of an important conversation, do you request that the person wait until you have finished?	1	2	3	4	5
43.	Do you freely volunteer information or opinions in class discussions?	1	2	3	4	5
44.	Are you reluctant to speak to an attractive acquaintance of the opposite sex?	1	2	3	4	5
45.	If you lived in an apartment and the landlord failed to make certain necessary repairs after promising to do so, would you insist on it?	1	2	3	4	5
46.	If your parents want you home by a certain time which you feel is much too early and unreasonable do you attempt to discuss or negotiate this with them?	1	2	3	4	5
47.	Do you find it difficult to stand up for your rights?	1	2	3	4	5
48.	If a friend unjustifiably criticizes you, do you express your resentment there and then?	1	2	3	4	5
49.	Do you express your feelings to others?	1	2	3	4	5
50.	Do you avoid asking questions in class for fear of feeling self-conscious?	1	2	3	4	5

APPENDIX D

DEPENDENT MEASURES & SCORING SCALES

APPENDIX D

DEPENDENT MEASURES AND SCORING SCALES

REACTION MEASURE

Please respond to the following items based on the scales provided.

SCALE

5 = Strongly Agree
4 = Agree
3 = Neither Agree or Disagree
2 = Disagree
1 = Strongly Disagree

1. I found the training program practical & interesting.

   5 4 3 2 1

2. I got more from this training than most people.

   5 4 3 2 1

3. There was very little in this program that I did not already know or use.

   5 4 3 2 1

4. I felt the training program was successful in improving my assertive communication skills.

   5 4 3 2 1

5. I tried as hard as I could to learn the skills taught in this program.

   5 4 3 2 1

6. I plan to use the assertive skills I have learned in my daily interactions with others.

   5 4 3 2 1

7. The behavior modeling tapes and discussion helped me to learn and understand how to use the key behaviors.

5 4 3 2 1

8. The models were realistic and informative for helping me learn the assertive communication skills.

5 4 3 2 1

9. I would recommend this program to other students.

5 4 3 2 1

SCALE:

5 = Outstanding
4 = Good
3 = O.K.
2 = Bad
1 = Terrible (A waste of time)

10. My overall rating of this training program would be:

5 4 3 2 1

Learning Measure & Scoring Scale

Instructions: In no more than two sentences, indicate your understanding of each of the twelve items listed below. You may use examples but if you do not remember an item at all, please do not guess.

1. **Fogging**
   Scoring Key: Acceptance of manipulative statements by calmly acknowledging the probability of some truth in the criticism but does not change your assertive position. Avoids retaliation, agression, temper, name-calling.

2. **I Statements**
   Scoring Key: Statements that begin with I. Serve the purpose of self-disclosing and taking responsibility for ones feelings without the necessity of using some external forces.

3. **Apologies**
   Scoring Key: Indicating sorrow for one's feelings or actions -generally inappropriate in assertive communication.

4. **Self-Disclosure**
   Scoring Key: Honesty about one's needs and feelings including the acceptance of responsibility for them. Includes use of I statements and an avoidance of things such as qualifiers, softening statements and fabricating better reasons for one's feelings.

5. **Offering "Better" Reasons**
   Scoring Key: Perhaps most common non-assertive behavior. Always inappropriate in truly assertive communication.

6. **Manipulative Statements**
   Scoring Key: Common technique used by people to talk one out of or convince one to do or accept something in opposition to one's original assertive position. should be acknowledged (fogging) but should not alter one's position.

7. **Broken Record**
   Scoring Key: Being persistent in a request or response / calm repetition. Avoids offering better reasons, temper, qualifiers.

8. **Assertive Non-Verbals**
   Scoring Key: Most critical are to keep head erect, look directly at focal person and speak clearly, firmly and to the point with no dramatic tone changes.

9. **Qualifying Statements**
   Scoring Key: Commonly used to make original assertive position more acceptable to focal person. Inappropriate in truly assertive communication.

10. **Negative Assertion**
    Scoring Key: Acknowledge and often accept faults, limitations and mistakes without apologizing for them. Avoids not only apologies, but retaliations, agression and name calling as well.

11. **Agression**
    Scoring Key: Focuses on person or attacking losing sight of assertive objective / inappropriate in assertive communication. Interest should center only on maintaining original assertive request or response and not on any kind of battle with focal person.

12. **Closure**
    Scoring Key: Important to check for two-way understanding of outcome or conclusion without sacrificing or comprimising original feelings.

The measure was scored by two independent, trained raters blind to experimental condition who assigned each response one of the following three ratings

3 = Response demonstrates an accurate and thorough understanding of the concept
2 = Response demonstrates some limited understanding of the concept
1 = Response demonstrates no understanding, inaccurate understanding, or very incomplete understanding

Reproduction Role-Play

Instructions:
The scenario is exactly the same as the one you saw on tape. You brought your car in for a general servicing and when you got it back the brakes squeal. Your role is to be as assertive as you can in trying to resolve the squealing brakes on your car. You should try to model Scott's effective behavior as exactly as you can. The trainer will model the service manager's role exactly.

Reproduction Role-Play Scoring Scale

Please rate each subject on the accuracy of reproduction of each of the 12 statements in boldface. Also, please observe the subject's overall nonverbal behavior (i.e., eye-contact & voice consistency) and record an overall rating at the end.

Scale is:

5 = Outstanding reproduction	(90% of actual words & sequencing)
4 = Good reproduction	75%
3 = Average reproduction	50%
2 = Poor reproduction	25%
1 = Very poor	(Less than 10% or no reproduction whatsoever)

Subject: Good Morning

Tim: Good Morning

(1) **Hi, my name's . I brought my car in a couple of days ago to get my brakes worked on under warranty and when I got my car back the brakes squealed really loudly and I really don't want brakes on my car that squeal.**

1 2 3 4 5

Tim: Well, I'm sorry Mr. Snell but there's really nothing we can do about that. Those are standard brakes and quite often they squeal that way.

(2) **Well, I am sure they might squeal that way from time to time, but when I brought my car in here the brakes didn't squeal and when I got it back they did. I really don't want brakes on my car that squeal.**

1 2 3 4 5

Tim: As I said before, really there is nothing we can do about that.

(3) **Could you tell me the name of your service manager and where I might find him?**

1 2 3 4 5

Tim: I am the service manager here, my name is Tim.

(4) **Well, Tim, I don't know much about brakes or why they might squeal but all I know is when I brought my car in here everything was fine in terms of the squealing and when I get it back they're squealing and I don't want brakes on my car that squeal that way.**

1 2 3 4 5

Tim: Well, Mr. Snell, do you have a work receipt on this?

(5) **Yes I do, right here (hands Ty the work receipt).**

1 2 3 4 5

Tim: (Reading work receipt) It says here this work was done last Wednesday. Why didn't you bring this to our attention last Wednesday or Thursday?

(6) **Maybe I should have, but my car is here now and I want brakes on my car that don't squeal.**

1 2 3 4 5

Tim: It also says that the brake cylinders on all four wheels were replaced. Here's what probably happened. The mechanic probably found a bit of brake leaking brake fluid on the brake shoes and decided to replace all four cylinders. It's something he didn't have to do, but something we like to do to insure our customers driving safety. And by the way, you weren't charged for it.

(7) **Well, I am sure what your are saying is true. But when I brought my car in here the brakes didn't squeal. It's that simple. When I got my car back they did squeal. I don't want my car in that condition.**

1 2 3 4 5

Tim: As I mentioned, these are replacement brakes that the factory provides us. They are much harder and better than the original brakes. Consequently, they might squeal a little bit.

(8) **I really don't doubt that you might have trouble from time to time with your factory replacements, but I don't see that as my problem. When I brought my car in here the brakes didn't squeal and now they do. I want brakes on my car that don't squeal.**

1 2 3 4 5

Tim: But these are brand new brakes that we installed for nothing. We didn't have to do it, we did it as a courtesy to you. We just like to take care of our customers driving safety.

(9) **Scott: Well, that is very courteous on your part. But, like I said before, I don't want my car having squealy brakes.**
1 2 3 4 5

Tim: C'mon! If we put the original brakes back on your car they won't last half as long as the new brakes we just installed. Does that make any sense?

(10) **I can understand your feelings, and maybe I'm not making any sense--maybe this isn't a rational decision--these brakes might last longer but I don't want them on my car if they are going to squeal that way.**
1 2 3 4 5

Tim: Can you leave the car with me this afternoon?

(11) **If I do will you fix my brakes?**
1 2 3 4 5

Tim: If you leave the car with me, I'll make sure the brakes get fixed.

(12) **When can I get my car back?**
1 2 3 4 5

Tim: We'll have your car by 10:00 tomorrow morning.

Subject: That would be great. I really appreciate your help.

Nonverbal Reproduction Accuracy: 1 2 3 4 5

Scale:

5 = Outstanding	(maintained steady eye contact & voice throughout)
4 = Good	(only a few minor exceptions of ineffective non-verbals)
3 = Average	(a mix of effective and ineffective non-verbals)
2 = Poor	(few cases of effective non-verbals)
1 = Very poor	(ineffective non-verbals throughout)

Generalization Role-Play

Instructions:
You work in a fast-food store (e.g., McDonalds, Burger King, etc.) and have the next two days off according to this week's schedule. The next two days are week days and you have made only tentative plans. However, you do not feel you should work the next two days even though your plans are only tentative. You are to refuse to work as the boss requests in the most effective assertive manner. The trainer will role-play your boss.

Generalization Role-Play Scoring Scale

Please rate each of the subject's eight responses with respect to his/her use of the appropriate assertive skills. Behavioral anchors for a level 5, 3, & 1 response are provided below each of the experimenter's verbal cues.

SCENARIO

Tim: Hi (subject name). Greg is sick and I need someone to cover for me tomorrow morning.

(1) **1 2 3 4 5**

5 = Oh, I am sorry to hear Greg is sick but I was scheduled off the next two days and won't be available tomorrow (or have tentative plans)

3 = Uh, no I really can't help you out this time, I have plans

1 = I am sorry but I can't work, this is Greg's and your problem.

Tim: Why, Is it something important like a doctors's appointment?

(2) **1 2 3 4 5**

5 = No, it's nothing that serious. I just have some tentative plans (OK to say what they are e.g. with friends or whatever), was scheduled off, and won't be available tomorrow

3 = No, but it wouldn't be right for me to reschedule my plans. I can't come in

1 = I'm sorry. But like I said, I can't do it. Or, yes, it is something like a Doctor's appointmment. Or something where they diffuse the reason and don't start with I.

Tim: Can't you call it off, I really need you tomorrow

(3) **1 2 3 4 5**

5 = I am sure you do. But I was scheduled off, made some plans and just will be unavailable tomorrow..

3 = No, I made plans and cannot come in (perhaps gives different reason)

1 = No. I'm sorry but that's your problem and Greg's problem.

Tim: Wow, You are leaving me in a bad situation ----.
(4) 1 2 3 4 5

5 = That may be. I can see you're in a bad situation. But I was scheduled off, made plans and won't be available tomorrow.

3 = No I can't come in but the situation isn't that bad anyway. Couldn't you get X to work or perhaps talk to Greg -- he is your problem.

1 = I'm sorry you are in this spot. But it is not me that is leaving you in this situation and I won't come in because (any new reason).

Tim: Well that's pretty unreliable -----, who am I going to get to work?
(5) 1 2 3 4 5

5 = It may seem unreliable to you and I am not sure who you might get to work. But I was scheduled off and since I have made plans I just won't be available tomorrow.

3 = Who have you tried? There are a lot of people who might be able to work if if you call them

1 = It is not unreliable -- it's not my problem

Tim: I don't understand the deal this time -----, you have always been available before
(6) 1 2 3 4 5

5 = That's true, I have been. But this time I made plans during my scheduled off time and I won't be available tomorrow

3 = I know and I think it is someone else's turn.

1 = I'm sorry but even though I have always covered for you in the past I can't this time (gives new reason or adds to old). This time pick on somebody else.

Tim: If you help me out, I could see that you get Saturday & Sunday off
(7) 1 2 3 4 5

5 = I am sure you would and I appreciate the offer. But the plans I have made are for the days I was orignially scheduled off (including tomorrow) and I won't be available then.

3 = But my plans are not for those days -- they are for tomorrow and the next day, when I was scheduled off.

2 = Sorry, but I can't do it.

1 = You would? So I could have the weekend if I come in? Well, in that case...

Tim: Greg may be sick for a while, do you think you could help me out in the days after tomorrow.

(8) **1 2 3 4 5**

5 = That's very possible. I certainly want to help out when I can and I have always tried to fill in in the past. It just happened that this time I had already made plans and couldn't be available. So if Greg is going to be sick for awhile just let me know and I will try to help out by covering his shifts when I can. Just let me know as soon as you know the situation.

3 = Well, maybe. It depends on what I have going at that time.

1 = I doubt it. I cover up for people too much. This is Greg's problem.

Tim: Well, Ok, I guess I will just have to get somebody else this time.

Overall Nonverbal Effectiveness: 1 2 3 4 5

NONVERBAL RATING SCALE:

5 = Outstanding	(maintained steady eye contact & voice throughout)
4 = Good	(only a few minor exceptions of ineffective non-verbals)
3 = Average	(a mix of effective and ineffective non-verbals)
2 = Poor	(few cases of effective non-verbals)
1 = Very poor	(ineffective non-verbals throughout)

Transfer Scenario

At the conclusion of their follow-up measures, trainees were requested to, before leaving, please stop and see a graduate student (set up in a closed office down the hall) who was working on a project of his own and needed subjects. The trainer hinted to the subjects that the graduate student was trying to raise funds by conducting a special promotion by an academic fund-raising firm in conjunction with various business publications. The graduate student had a fake brochure (included in this appendix) and an offer sheet that had several names signed already to give the impression that others had, in fact, accepted the offer. Once subjects had entered the office, the graduate student created the scenario described below.

I am trying to raise funds for my dissertation by participating as a sales representative for a promotion involving several business publications. Of course, if you buy I get a percentage of the sale (6%) and this will really help me out. Here's the offer (show them the offer sheet) run through quickly and then circle the $71.95.

The graduate student then role-played it as consistently with subject responses as possible but ensured that all subjects had to deal with the following manipulative comments (whether they brought them up or not)

1. It would really help me out (built into intro)

2. This is a good deal - not that expensive really.
   Substantial savings off cover price
   Less than $25.00 per month - $6.00 per week
   No money now, You can pay later

3. It seems like a lot but if you're worried about too much, WSJ comes every day, Business Week every week & Fortune every two weeks. Can substitute Money or Forbes or take WSJ and only one other for $60.00 even.

4. Lots of your student colleagues are doing it (show them order form)

5. I think you're making a mistake. Great information for term papers, case studies and just being informed about your major - which so few students really are. Deal like this won't come around again.

Debriefing. Also, please be sure to emphatically tell them to please not tell anyone else in study about this session. It is critical to my research objective that all trainees enter the confederate office unaware that they are still being evaluated.

Transfer Scenario Scoring Scale

Please rate each of the five subject responses with respect to his/her use of the appropriate assertiveness skills. Behavioral anchors for a level 5, 3, & 1 response are provided below each of Rick's verbal cues.

Scale:

5 = Outstanding use of the skill
4 = Good use of the skill
3 = Average use of the skill
2 = Poor use of the skill
1 = Very poor or no use of the skill

SCENARIO

Rick: It would really help me out (built into intro)
(1) **1 2 3 4 5**

5 = I am sure it would help you out, but I really do not want to take the offer at this time (OK to give reason)

3 = No, I don't think I can do that (or, I'm not interested).

1 = I'm sorry, but there is no way I can take that offer right now.

Rick: This is a good deal - not that expensive really.
Substantial savings off cover price
Less than $25.00 per month - $6.00 per week
No money now, You can pay later
(2) **1 2 3 4 5**

5 = I am sure what you're saying is true. I might be able to save quite a bit of money and pay on installment but I don't want to do it at this time because...(same or closely parallel reason to that given above).

3 = No, I don't think so right now (or, still not interested).

1 = I'm sorry but I can't (comes up with more new reasons).

Rick: It seems like a lot but if you're worried about too much, WSJ comes every day, Business Week every week & Fortune every two weeks. If you like, you could substitute Money or Forbes or take WSJ and only one other for $60.00 even.

(3) **1 2 3 4 5**

5 = That's true (or interesting or a good point) that the reading is spaced. But I still don't want to go for the offer at this time (gives same reason as above).

3 = I could? Well, it seems like a good deal but I don't think I can do it.

1 = No way. Too much reading and I'm sorry but I can't do it.

Rick: Lots of your student colleagues are doing it (show them order form)

(4) **1 2 3 4 5**

5 = Well, that me be (or, I can see that they are). However, I don't want to today (for the same reason given above).

3 = Oh, well maybe they are but I still can't.

1 = They are? Well that's their choice and I am sorry but I am not going to do it just because they are

Rick: I think you're making a mistake. Great information for term papers, case studies and just being informed about your major - which so few students really are. Deal like this won't come around again.

(5) **1 2 3 4 5**

5 = Well, it may seem like a mistake to you (or, I may be making a mistake). And it does seem to be a lot of good information and a good deal. But in my case, I don't want to sign-up today because (exact reason given above) but I do appreciate the offer and wish you luck on your paper.

3 = Maybe so, but I can't sign up today.

1 = I don't think it is a mistake (any variety of denials or new reasons or amplification of old reasons).

(6) (Debriefing).

APPENDIX E

PROCESS MEASURES

APPENDIX E

PROCESS MEASURES

Motivation to Attend Scale

Please complete this survey concerning your attention to the four videos you viewed in the training program

SCALE:
- 4 = Very Closely Attended Throughout
- 3 = Attended Throughout
- 2 = Only Casually Attended
- 1 = Did not Attend

	VC	AT	CA	NA
1) Video 1:	4	3	2	1
2) Video 2:	4	3	2	1
3) Video 3:	4	3	2	1
4) Video 4:	4	3	2	1
5) Overall	4	3	2	1

SCALE:
- 4 = Strongly Agree
- 3 = Agree
- 2 = Disagree
- 1 = Strongly Disagree

	SA	A	D	SD
6) I felt that each successive video kept my attention and contributed to my understanding of the learning points	4	3	2	1
7) I felt that I did not need to closely attend to all videos to understand the learning points	4	3	2	1

Comment:

Notes:

The Videos 1-4 were different for each condition.
Item =7 was reverse scored.

Retention Scale

(Scoring key is included under each item)

Instructions: In no more than two sentences, indicate your understanding of each of the twelve items that were included in the training program you attended four weeks ago. You may use examples, but if you do not remember an item at all, please do not guess.

1. **Fogging**
   Scoring Key: Acceptance of manipulative statements by calmly acknowledging the probability of some truth in the criticism but does not change your assertive position. Avoids retaliation, agression, temper, name-calling.

2. **I Statements**
   Scoring Key: Statements that begin with I. Serve the purpose of self-disclosing and taking responsibility for ones feelings without the necessity of using some external forces.

3. **Apologies**
   Scoring Key: Indicating sorrow for one's feelings or actions -generally inappropriate in truly assertive communication.

4. **Self-Disclosure**
   Scoring Key: Honesty about one's needs and feelings including the acceptance of responsibility for them. Includes use of I statements and an avoidance of things such as qualifiers, softening statements and fabricating better reasons for one's feelings.

5. **Offering "Better" Reasons**
   Scoring Key: Perhaps most common non-assertive behavior. Always inappropriate in truly assertive communication.

6. **Manipulative Statements**
   Scoring Key: Common technique used by people to talk one out of or convince one to do or accept something in opposition to one's original assertive position. should be acknowledged (fogging) but should not alter one's position.

7. **Broken Record**
   Scoring Key: Being persistent in a request or response / calm repetition. Avoids offering better reasons, temper, qualifiers.

8. **Assertive Non-Verbals**
   Scoring Key: Most critical are to keep head erect, look directly at focal person and speak clearly, firmly and to the point with no dramatic tone changes.

9. **Qualifying Statements**
   Scoring Key: Commonly used to make original assertive position more acceptable to focal person. Inappropriate in truly assertive communication.

10. **Negative Assertion**
    Scoring Key: Acknowledge and often accept faults, limitations and mistakes without apologizing for them. Avoids not only apologies, but retaliations, agression and name calling as well.

11. **Agression**
    Scoring Key: Focuses on person or attacking losing sight of assertive objective / inappropriate in assertive communication. Interest should center only on maintaining original assertive request or response and not on any kind of battle with focal person.

12. **Closure**
    Scoring Key: Important to check for two-way understanding of outcome or conclusion without sacrificing or comprimising original feelings.

NOTES:

The measure was scored independently by two trained graduate students, blind to condition and using the 3-point scoring scale below.

3 = Response demonstrates an accurate and thorough understanding of the concept
2 = Response demonstrates some limited understanding of the concept
1 = Response demonstrates no understanding, inaccurate understanding, or very incomplete understanding

APPENDIX F

TRANSFER SCENARIO BROCHURE

APPENDIX F

Transfer Scenario Brochure

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