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ABSTRACT

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By

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This study examined the extent to which the framing of training program assignments affects training outcomes. A model was developed suggesting that training assignment can provide feedback regarding past performance and result in different attitudinal and motivational levels going into training. These differences in attitudes and motivation were hypothesized to affect various affective as well as performance training outcomes.

Undergraduate students (n = 163) participated in the study examing the effectiveness of a training program designed to improve performance on a computer Air Defense Task. Participants were randomly assigned to two differently framed training programs (remedial vs advanced). An additional 54 undergraduates participated in the study but did not receive any framing information. This group served as a control group in various exploratory analyses. The participants in the experimental groups were told that their assignment was made based on their level of performance during an initial ability measure. Furthermore, the participants were told that the training programs were specifically designed to improve the performance of high and low ability individuals, depending on their training assignment.

The results showed that a number of individual characteristics moderated the relationship between training assignments and pre-training characteristics. In addition, motivation to learn was found to be positively related to various training performance outcomes. Implications for training effectiveness research and practice are discussed.

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INTRODUCTION

Training has become a critical component of an organization's competitive edge (Rosow & Zager, 1988). Changes in technology have forced companies to develop training programs to keep up with these rapid advances. In fact, successful organizations of the future will be what can be called "learning organizations" or organizations that better adapt to changes through their ability to learn. This is reflected in continuous learning programs that are springing up in companies throughout the country (Noe & Ford, 1992).

Changes in the demographic characteristics of the workforce are also causing organizations to reconsider their human resources strategies (Goldstein & Gilliam, 1990). A shrinking labor force is forcing companies to focus on worker retraining as a way of maintaining a productive workforce. These trends toward increased technological advances, global competition, and a changing workforce, highlight the need for research on training effectiveness. This becomes even more important when one considers that of the billions of dollars spent annually in training, only about ten percent of these expenditures result in performance changes back on the job (Georgenson, 1982).

Past research on training effectiveness has tended to focus on training design elements such as identical elements, task repetition, and training delivery (see Cormier & Hagman, 1987; Goldstein, 1986). This led to a number of studies examining the impact of various training designs on knowledge and skill acquisition. While providing valuable information regarding training effectiveness, these studies have been relatively narrow in scope and have usually examined simple psychomotor tasks. Recent reviews of the training literature have lamented this apparent lack of theoretical development in the field and have called for a paradigm shift which begins to look at training in a more integrated

and complex way (cf. Tannenbaum & Yukl, 1992). More recently a few theoretical frameworks of training have been developed which take into account other factors in addition to training design.

Baldwin & Ford (1988) proposed that training effectiveness is a function of trainee characteristics, training program characteristics, and environmental variables. Individual level variables such as trainee motivation (Noe & Schmitt, 1986), self-efficacy (Gist, Stevens, & Bavetta, 1991), and ability (Ree & Earles, 1991) have been shown to be related to training outcomes. Researchers have also noted the importance of environmental factors such as workgroup climate (Ford, Quiñones, Sego, & Sorra, 1992; Rouillier & Goldstein, 1991) and supervisor support (Marx, 1982) on the transfer of training. These variables represent what Goldstein (1986) referred to as "climate for transfer".

Noe (1986) highlighted the importance of pre-training trainee attitudes and attributes in affecting training outcomes. Other pre-training factors such as trainee expectations have also been investigated (Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991). In addition to pre-training individual characteristics, a number of contextual factors prior to training have also proven to be important in the training process. For example, Baldwin, Magjuka, & Loher (1991) showed that participation in the decision making process prior to training can affect individual's attitudes and motivation going into training. These studies demonstrate that training effectiveness is more than just a function of training design. Factors prior to, during, and after training can all have an impact on training effectiveness. The present study focuses on pre-training characteristics and their impact on training outcomes.

The way in which an organization labels or frames a training program is one factor which can affect pre-training attitudes and motivation. Martocchio (1992) showed that framing a computer training program as an opportunity had an impact on training outcomes. Trainees who believed that the training program will help enhance their career

were more likely to perform better in training. So clearly, organizations must pay more attention to pre-training contextual factors which can serve to enhance or undermine any benefits that they may hope to gain by implementing a new training program.

One pre-training contextual factor that has received little attention in the literature is the labeling of the purpose for attending the training program. Organizations often conduct training to make up for deficiencies in the skills of individuals (Goldstein, 1992). This type of training can be referred to as remedial training. On the other hand, training assignments can sometimes indicate that an individual is performing well and is being groomed for promotion or higher responsibility (Howard & Bray, 1988). In this case, individuals may be assigned to what can be called advanced training. These labels can frame or place a context around an individual's assignment to training and result in differences in attitudes and motivation going into training.

Another factor which makes the study of labels attached to training programs more critical is the increased attention being devoted to aptitude/treatment interactions (cf. Ackerman, 1989; Kanfer & Ackerman, 1989). An aptitude/treatment interaction approach recognizes that different ability individuals may learn better under certain types of training program designs. However, assigning different ability individuals to different training programs requires the categorization of both, trainees, as well as training programs. Even if relatively neutral labels are used to classify trainees and training programs, these labels are likely to become very value laden as individuals in an organization begin to recognize which individuals are being assigned to what types of training. Furthermore, the very act of categorization serves to cue up differences between individuals as well as training programs. If aptitude/treatment interactions are to be implemented widely, more research is necessary which investigates the potential effects of assigning different trainees to differently labeled training programs.

Therefore, aside from the objective purpose of the training program, labeling a training program is likely to have an impact on an individual's attitudes and motivation going into the training program. The labeling of the training program may communicate information about a trainee's performance, ability, motivation, expectations, and attributions for their past performance. Because these labels carry with them such a high level of evaluative baggage, it is important to understand their effects on trainees and training outcomes (Noe, 1986).

Research on human decision making has shown that the way a problem is framed (gain vs loss) has an impact on the decision strategy used (Kahnemann & Tversky, 1979). In addition, research in the education literature suggests that children attend to the expectations that adults have regarding their performance and achieve accordingly (Rosenthal & Jacobson, 1968). This phenomenon has been called the pygmalion effect (Ross & Nisbett, 1991). In addition, there is evidence to suggest that feedback, especially negative feedback, can have motivational as well as affective consequences (Ilgen, Fisher, & Taylor, 1979; Martocchio & Webster, 1992). Therefore, the label assigned to a training program can have unintended effects on training outcomes by communicating information to the trainee which, in turn, affects their pre-training attitudes and motivation.

The present study expands our knowledge of the effects of pre-training contextual factors on training outcomes. The study examines the extent to which framing the purpose of attending a training program affects training outcomes. Specifically, the effects of assigning an individual to training because they have been performing poorly (remedial training) as opposed to assigning them for superior performance (advanced training) are examined. The mechanisms by which the framing of training assignment can affect training outcomes are identified and used to develop a number of research hypotheses.

The study is organized in the following manner. First, an overview of the literature on framing is presented. Second, a review and discussion of the literature investigating

pre-training factors is presented. Third, theories describing the mechanisms by which pre-training context can affect trainee attitudes and motivation are reviewed. Fourth, potential individual differences which may moderate the relationship between pre-training context and training outcomes are discussed. Finally, a conceptual model and hypotheses derived from this model regarding the expected effects of training assignment are presented.

Framing

A great deal of attention has been devoted in the psychological literature to studying the effects of framing. In its general form, framing refers to an individual's "schema", or cognitive representation, of a situation or set of circumstances (Srull & Wyer, 1980). Frames have been shown to affect the encoding, processing, and retrieval of information regarding persons and objects in a number of situations. This effect also includes information regarding the self (Fiske & Taylor, 1991). The present study makes the argument that training programs can have different "frames" which communicate information to the trainee about themselves such as their past performance level by categorizing them and assigning to a particular training program. For this reason, a brief review of the literature on framing effects is presented.

The study of framing effects has been most thoroughly examined in the context of human decision making. Researchers have found that humans often do not follow normative rational models of decision making (Einhorn & Hogarth, 1981). Kahneman & Tversky (1979) developed what is known as prospect theory to explain these departures from rationality. The theory basically states that the way in which a problem is framed, in addition to objective characteristics of the decision, will have an impact on the final outcome of the decision. Research results show that individuals are more willing to take risks when a decision is framed as a loss as opposed to a gain.

Prospect theory hypothesizes that individuals are influenced by contextual factors when evaluating information. Two identical propositions involving similar payoff structures are evaluated differently depending on whether they are framed as involving probabilities for a gain or a loss (Dutton & Jackson, 1987). In addition to affecting decision making, frames can also affect the encoding and retrieval process.

Contemporary models of human cognition view human perception as being guided by organizing mental categories or "schemas" (cf. Srull & Wyer, 1980). These schemas act to filter both incoming and outgoing information from a person's memory storage (Quiñones, 1990). Schemas have been shown to affect an individual's view of others as well as themselves. Framing is believed to activate schemas and make them accessible during certain situations. One way in which schemas are activated by framing is through the use of labels (Hattrup, 1990; Srull & Wyer, 1989). Labels are descriptive words or statements which cue up a number of related attributes. For example, a label of "librarian" can cue up characteristics such as shy, studious, or inhibited (Hattrup, 1990).

The accessibility of schemas through labeling has been used to explain the persistence of stereotypes in person perception (Fiske & Taylor, 1991; Hattrup, 1990). Labels attached to others help fill in the gaps about the kinds of characteristics that go along with the label. Common person labels include race, occupation, as well as trait descriptions such as honest or criminal. Schemas activated through labeling have been shown to result in biased encoding and recall which help perpetuate stereotypes (Fiske & Taylor, 1991). Research has shown that individuals tend to encode and recall information which is consistent with the category label (cf. Hastie, 1980). Thus, frames activated through labels help individuals make sense of their world by providing a unified structure with which to perceive incoming information.

Researchers have also noted that individuals also hold schemas about themselves, or "self-schemas" (Markus & Sentis, 1982). These self-schemas guide information

processing about the self. Self-schemas can be made salient through labels given to individuals by others such as teachers, employers, etc. These labels can then serve to influence an individual's subsequent behavior. The most famous illustration of this phenomenon is the concept of the self-fulfilling prophesy (Merton, 1948; Snyder, 1984). The basic notion of the self-fulfilling prophesy is that labels attached to individuals can influence other's perceptions and actions toward them which, in turn, results in the individual behaving in ways which are consistent with this expectation (Ross & Nisbett, 1991).

The classic study on self-fulfilling prophesy was conducted by Rosenthal & Jacobson (1968). In their study, first- and second-grade children were randomly labeled as high or low IQ. These labels were provided to their teachers at the beginning of the school year. Follow up measures showed that children labeled as high IQ performed significantly higher than those labeled as low IQ. Subsequent investigations revealed that teachers tended to treat the high IQ labeled children differently than the low IQ children (Rosenthal & Rubin, 1978). Teachers provided more encouragement and feedback and expected more from children whom they believed to be smarter (Harris & Rosenthal, 1985; Meichenbaum, Bowers, & Ross, 1969; Rosenthal, 1976, 1985).

In addition to altering other's behaviors, labels can influence a person's own behavior. In a study conducted by Miller, Brickman, & Bolen (1975), the effects of labeling on children's littering behavior was investigated. One classroom was assigned to a persuasion condition which received lectures on the virtues of cleanliness and the importance of keeping the classroom clean. A second classroom was praised and commended for already being clean and neat. This constituted the label manipulation. Finally, a third classroom served as a control group. The results showed that the kids who were told that they were neat and clean did indeed keep their classroom the cleanest and this behavioral change persisted long after the manipulation was withdrawn.

It is clear that labels can cue up frames or schemas about others as well as the self. Labels attached to individuals can result in behavior that is consistent with that label or, at least, result in a reaction to this label. Labels attached to decision outcomes can influence an individual's decision making process. Thus, labels, to the extent that they cue up frames or schemas, are an important aspect of human perception and behavior. However, little is known about the labeling effects on trainees. The present study takes the viewpoint that labels or frames can place a context around the training program which can influence a trainee as they enter the training program. These labels can cue up self-schemas which can affect attitudes and motivations going into training. A review of these pre-training context factors is now presented with a focus on pre-training framing effects.

Pre-Training Factors

Context

Context refers to the circumstances surrounding an event. Recent views of training have recognized that training is an activity which is embodied within a larger organizational reality. Thus training has come to be seen as a subsystem of the larger organizational human resources system (Goldstein, 1992). This study takes the view that trainees do not arrive at the training site *tabula rasa*. Circumstances surrounding the reasons and ways by which they were assigned to training can frame or put a context around the training program. The study of the effects of pre-training context factors on training is a relatively new phenomenon. There are, however, a growing number of studies which suggest that pre-training context is important in affecting training outcomes. A review of this body of research is now presented.

Training Assignment. Surprisingly, little research exists on the effects of training assignment on trainee attitudes and motivation. Training research usually takes the

assignment process as a given. However, not all trainees arrive at the training program under equal circumstances. For example, some may have chosen to go to training while others may have been forced to attend. The extent to which individuals have a choice in deciding which training program to attend is one aspect of training assignment that has received some attention. Based on the participation literature, researchers have noted that participating in the choice process prior to training should enhance trainee's satisfaction with training and their motivation to attend and learn during the training program. For example, Hicks and Klimoski (1987) found that trainees who perceived that they had freedom to attend the training program reported higher training satisfaction and performed better during training.

Baldwin, Magjuka, & Loher (1991) agreed that participation prior to training is important. However, they noted that organizational realities may deny trainees the opportunity to attend the training program that they had chosen. Their study found that individuals who were allowed to participate in the choice process but were subsequently denied their choice had lower pre-training motivation and learned less than trainees who were not given the opportunity to participate in the choice process at all. The highest motivation to learn and actual learning occurred among trainees who were given the opportunity to participate in the choice process and actually received the training program which they had chosen.

These two studies provide evidence suggesting that the circumstances, or context, surrounding training assignments are important determinants of training performance. Differences in motivation were observed depending on the circumstances surrounding the assignment. It appears that by allowing individuals to participate in deciding which programs to attend, they develop expectations about the activities they will be involved in as well as the KSAs that will be covered during training (Tannenbaum et al., 1991). If these expectations are not met, trainees react in a negative way.

Tannenbaum et al. (1991) conducted a study to directly test the hypothesis that trainee expectations prior to training can influence training outcomes. They hypothesized that, to the extent that these expectations are fulfilled, training performance as well as reactions to training will be enhanced. In a test of their hypotheses, Naval recruits (n=1037) indicated their expectations about the KSAs that would be covered in an upcoming training program. At the end of training, the recruits indicated the extent to which their expectations had been fulfilled. This measure of training fulfillment was found to be correlated with training motivation, academic and physical self-efficacy as well as organizational commitment at the end of training. Individuals who felt that their expectations had been met reported higher levels of confidence in their ability to perform some of the trained KSAs. In addition, higher fulfillment resulted in individuals having a more favorable impression of the organization.

Framing. In the present study, it is argued that training programs can have different labels attached to them which can communicate information to trainees. Labels can act as a frame which trainees can use to make inferences regarding the training program and the circumstances under which they were assigned. Their assignment can cue frames which affect trainee perceptions of themselves and their ability to do well in training.

Martocchio (1992) hypothesized that social context can frame the training situation by emphasizing different aspects of the training program such as training content, difficulty, and usefulness. Specifically, the study hypothesized that framing training on microcomputer usage as an opportunity can influence a trainee's view of their capacity to learn the training material. Full time university clerical and administrative employees (n=84) attended a microcomputer training program which was described as either an opportunity to increase one's competence or as neutral (i.e. no context description). Results indicate that context had a significant effect on learning during the training program. Those in the opportunity frame showed higher learning than those in the control

condition. This effect was largely due to the fact that the opportunity framing decreased computer anxiety and indirectly increased computer efficacy beliefs.

The studies cited above provide evidence that factors present prior to trainees entering a training program can affect training outcomes. Trainee expectations regarding the content of the training program as well as the amount of choice involved in selecting a training program appear to be important variables which must be considered when implementing training interventions. More important to the present study, the way in which the training program was framed showed significant effects on training performance. Context acts to focus a trainee's attention to training content, difficulty, or usefulness, all of which can have an influence on their motivation and attitudes.

However, no attention has been paid to the potential effects of framing the assignment of an individual to training. Framing a training program as remedial as opposed to advanced should also serve to cue up different evaluations of the self. Specifically, trainees are likely to make different assessments of their capability to learn (efficacy beliefs) depending on how the training program is framed. This sort of framing conveys feedback regarding an individuals prior level of performance depending on the type of training to which they are assigned. Feedback has been shown to have motivational as well as affective outcomes (Ilgen, Fisher, & Taylor, 1979).

Training Assignment as Feedback. Clearly organizations use training programs as rewards for good performance or as a way of indicating poor performance. So, assignment to different training programs which convey feedback about past performance can provide a frame or context. Traditionally, training research has investigated feedback in the context of trial learning (Holding, 1965; Komaki, Heinzman, & Lawson, 1980). Individuals master a task by learning from their past mistakes. However, the effects of feedback as it relates to training motivation and performance has been relatively unexplored.

While feedback has been present in many training studies, the effects of that feedback on trainee performance remains relatively unknown. Martocchio & Webster (1992) hypothesized that positive feedback during training should enhance training performance while negative feedback should inhibit performance. They argue that feedback serves as a source of self-regulatory information which triggers the expenditure of attentional resources as a trainee progresses through the training program. This hypothesis was supported in their study. Individuals receiving negative feedback showed less learning over time than those receiving positive feedback. In addition, they found that positive feedback served to increase self-efficacy while negative feedback tended to lower self-efficacy.

Martocchio and Webster (1992) proposed that social cognitive theory provides an appropriate framework for investigating the effects of feedback in a training setting. The present study is concerned with the extent to which feedback conveyed by training assignment affects training outcomes. Therefore, a framework which links assignment, feedback, and training outcomes is necessary. The following section explores two potential mechanisms by which framing of the training assignment can affect training outcomes. These include self-efficacy and motivation.

Self-Efficacy

Bandura's (1986; 1991) social cognitive theory serves as a framework for understanding the effects of training assignment on training performance. It has been argued that training assignment, depending on how it is framed, can convey feedback regarding a trainee's past performance. Social cognitive theory suggests that feedback can affect task performance through the process of self-regulation (Bandura, 1977). Feedback helps individuals compare their past performance to a standard. This evaluation then

determines an individual's belief in their capability to perform successfully in the future, or self-efficacy beliefs (Bandura, 1991).

Self-efficacy (Gist & Mitchell, 1992) refers to people's beliefs that they can attain a given level of performance. It represents an individual's cognitive representation of ability, motivational, and situational factors that will enhance or inhibit performance (Bandura, 1977; 1982; 1986). Self-efficacy, in other words, represents an individual's belief that they have what it takes to perform under a given set of circumstances. In a training or learning situation, self-efficacy refers to an individual's belief that they can master the trained material (Schunk, 1989).

Performance feedback has been shown to affect self-efficacy. In general, the research suggests that negative feedback serves to lower self-efficacy (Bandura, 1986). Individuals who have performed poorly in the past are less likely to believe that they will be successful in the future. Positive feedback, on the other hand, serves to increase self-efficacy. Bandura (1986) argues that success experiences are one way by which individuals can gain a sense of confidence that they will be able to perform successfully in the future. Because the framing of training assignment is believed to convey feedback, and feedback has been shown to affect performance through self-efficacy (cf. Martocchio & Webster, 1992), a closer look at self-efficacy and its role in training and learning is warranted.

Self-efficacy beliefs have three distinct characteristics (Bandura, 1977). First, self-efficacy beliefs vary in magnitude, or the level of performance that individuals believe they can achieve. Second, individuals differ in the certainty , or strength, of these efficacy beliefs. Finally, self-efficacy beliefs vary in the generality of behaviors that individuals believe are within their personal control.

Self-efficacy beliefs are a component of self-regulation (Bandura, 1991). Self-efficacy influences motivational and effort levels as individuals regulate their behavior to

match a given personal standard (Bandura & Cervone, 1986). In fact, research has found a relationship between self-efficacy and goal level as well as goal commitment (Locke, Fredrick, Lee, & Bobko, 1984; Taylor, Locke, Lee, & Gist, 1984). In addition, self-efficacy has been shown to be related to effort and persistence during task performance (cf. Schunk, 1981). High self-efficacy individuals are more likely to continue to expend effort, even when faced with initial failures. Low self-efficacy individuals tend to withdraw effort and perform poorly.

Self-efficacy has been shown to be related to performance (Bandura, 1991; Barling & Beattie, 1983), career choice (Lent, Brown, & Larkin, 1987), as well as learning (Campbell & Hackett, 1986; Wood & Locke, 1987). In a training context, self-efficacy has been found to be related to the acquisition of computer software skills (Gist, Schwoerer, & Rosen, 1989; Martocchio & Webster, 1992), idea generation skills (Gist, 1989), as well as complex interpersonal skills (Gist, Stevens, & Bavetta, 1991). For example, Gist et al. (1989) found that a training format which increased self-efficacy resulted in higher learning among managers attending an idea generation course. In another study, Ford et al. (1992) found that individuals higher in self-efficacy were performing more trained tasks four months after training.

The educational literature has also amassed a great deal of evidence suggesting that self-efficacy is a key component in learning and classroom performance (Pintrich & DeGroot, 1990; Schunk, 1981; 1982; 1984; 1989). Students who reported higher levels of self-efficacy learned more and performed at higher levels on classroom exercises and tests than their low self-efficacy counterparts. Furthermore, high self-efficacy students persisted longer when faced with initial failure than low self-efficacy students (Schunk, 1989).

In training studies, self-efficacy has been typically treated as an antecedent variable which affects the outcome of interest. However, little attention has been paid to the factors which influence an individual's self-efficacy judgements. Social cognitive theory

hypothesizes a number of mechanisms by which an individual arrives at a given self-efficacy level (Gist & Mitchell, 1992). Taking these into account should provide a clearer picture of the dynamics involved in developing self-efficacy and translating these into higher learning, especially how training context can affect self-efficacy.

Self-efficacy involves situational as well as individual factors which result in judgments regarding future behavior. Four general categories of determinants of self-efficacy have been proposed. These include enactive mastery, vicarious experiences, verbal persuasion, and physiological arousal (Bandura, 1982). Gist & Mitchell (1992) developed a model in which they further articulate the mechanisms by which self-efficacy is developed. Their model proposes three types of assessment processes involved in forming self-efficacy judgments.

First, an individual analyzes the task requirements to determine the amount and type of ability required for performing at various levels. When an individual has intensive experience with the task, past performance outcomes tend to influence this assessment. The second assessment involves the individual's inferences regarding the causes of this past behavior. Two individuals who performed at the same level may make different assessments of their future performance (i.e. self-efficacy) depending on their attributions regarding the performance outcome. Finally, individuals assess themselves as well as the setting to determine the availability of resources and constraints for performing at various levels. These three assessments then combine to form a judgment regarding one's future behavior, or self-efficacy.

Framing of the training program can influence self-efficacy beliefs through at least two mechanisms. First, framing can influence self-efficacy by providing feedback regarding past performance. Individuals who are sent to remedial training may infer that they have performed poorly and may therefore lower their self-efficacy beliefs. A more

positive frame, advanced training, may suggest that performance has been superior and therefore would result in higher levels of self-efficacy.

Second, framing can also cause trainees to search for explanations for their past behavior. Explanations for past behaviors or outcomes are referred to as attributions. If training assignment conveys feedback regarding past performance, the attributions that are made regarding this past performance can determine an individual's belief regarding future behavior. Therefore, training assignments are likely to trigger the attributional process. The role of attributions in the development of self-efficacy is explored below.

Attributions. Attributions are critical in determining self-efficacy (Gist & Mitchell, 1992). They determine how an individual uses feedback regarding past performance to make judgements about future levels of performance. Three dimensions of attributions have been identified. These include locus, stability, and controllability (Weiner, 1985). Locus refers to whether the causal factor lies within the individual (internal) perceiver or in the environment (external). Stability refers to the extent to which the causal factor is (or is perceived to be) subject to change. Finally, controllability is the extent to which the causal factor is subject to the control of the individual. Causes which are expected to change tend to have little effect on perceptions of future performance whereas those which are perceived to be unlikely to change have a large impact on expectations of future performance (Bandura, 1991). Other studies have also found that perceived controllability can have an impact on an individual's self-efficacy and subsequent performance (Bandura & Wood, 1989).

Individuals who attribute past performance to factors within their control (e.g. effort) are likely to develop higher levels of self-efficacy as a result of positive feedback because they perceive that their efforts will lead to specified performance levels (Weiner, 1985; Schunk, 1982). In contrast, those who attribute past behavior to situational factors are more likely to develop lower levels of self-efficacy because of their belief that nothing

they can do will result in a given level of performance (Gist & Mitchell, 1992). Furthermore, poor performance may not necessarily lead to lower self-efficacy levels if this performance can be "explained away" by attributing it to unstable and controllable factors (Gist & Mitchell, 1992). This suggests that framing can have an impact on self-efficacy to the extent that the trainee feels that their performance is within their control.

Research has found that individuals vary in their attributional styles. Some individuals have a tendency to attribute past performance to internal factors while others tend to assume that performance was caused by external factors. This suggests that these two types of individuals are likely to develop different levels of self-efficacy as a result of training assignment because of the types of attributions they make. A closer look at this individual difference factor is presented.

Locus of Control. Locus of control is a relatively stable personality characteristic which is related to an individual's propensity to attribute the cause of an outcome to internal or external causes (see Rotter, 1966). Individuals with an internal orientation believe that performance or outcomes are a result of their own behavior and efforts. Conversely, externals believe that most of what happens to them is a result of external causes beyond their control such as luck, fate, or the action of others. Thus, internals are more likely to be proactive and engage in behaviors that will lead to desired outcomes because they perceive the contingencies between their actions and outcomes.

In a review of the literature on locus of control in organizational behavior, Spector (1982) reported that numerous studies have found relationships between locus of control and perceptions of job characteristics, job performance, motivation, expectancies, as well as dealing with others. Noe (1986) suggests that in a training context, those with an internal locus of control are more likely to react to performance feedback regarding their skill strength and weaknesses. Internals may actually discount or question the accuracy of negative feedback in making judgments about their own behavior (Stone, Gueutal, &

McIntosh, 1984). However, when feedback is given, internals are more likely to take action in order to correct their lack of skill or knowledge (Phares, Ritchie, & Davis, 1968; Weiss & Sherman, 1973).

In response to different framings of training assignments, internals are more likely to be affected by being told that they are entering a remedial training program than an advanced training program. Because they perceive the causes of their past behavior as resulting from their own actions, internals will take this label or frame more personally as reflecting an inadequacy on their part. They may then be more motivated toward performing well in the training program. It is also possible that internals may also question the adequacy of the training program for them which will also cause them to work hard during training in order to prove that they in fact were not deficient.

By contrast, externals are more likely to attribute the cause of their past behavior to external causes such as task difficulty (Rotter, 1966). Therefore, framing a training program may have little effect on external trainees. Assignment to a remedial training program may actually decrease their self-efficacy and motivation because they may fail to see how their actions can result in higher learning. Therefore, it is expected that locus of control may moderate the relationship between training program label or frame and pre-training self-efficacy.

Self-Esteem. A second individual difference factor which is likely to moderate the relationship between training assignment and self-efficacy is trainee's level of self-esteem. Training assignments can either violate or confirm an individual's level of self-esteem. Therefore, it is likely that low self-esteem trainees will react differently than high self-esteem trainees when assigned to either remedial or advanced training. This assignment can boost their confidence level (advanced training) or crush an already low level of self-confidence (remedial training).

There are, in fact, theories relating the consistency of feedback to an individual's view of him or herself and the potential effects on subsequent behavior (see Hattrup, 1992). The theories basically state that individuals strive for control over their behavior. Therefore, feedback is interpreted in relation to the self-concept. Long standing arguments exist as to whether people seek to maintain consistency between feedback and self-concept or they seek to improve or enhance their self-image (Dipboye, 1977). While the exact motives which operate at any given time can be argued, recent theories of human behavior have generally agreed that individuals do in fact compare self-relevant feedback with some sort of internal standard in order to regulate their future behavior (e.g. Carver & Sheier, 1990).

In general, research shows that individuals prefer positive over negative feedback irrespective of their self-image (McFarlin & Blascovich, 1981). However, when that feedback is inconsistent with an individual's self-image, differences are found between high and low self-esteem individuals in terms of their expected future performance. The research suggests that people with a positive self-image who receive negative feedback become very motivated to perform at higher levels in order to receive feedback which is consistent with their positive self-image (Swann, 1990). In contrast, low self-image individuals who receive negative feedback are not necessarily motivated to change their behavior. Therefore, it appears that in order to maintain a sense of control over oneself, individuals seek out or interpret feedback in a way that is consistent with their self-image (Swann, 1987). When discrepancies occur, individuals are motivated to behave in ways that restore consistency (Carver & Scheier, 1990).

High self-esteem individuals who are sent to remedial training may be motivated to perform well and may actually develop high levels of self-efficacy. By contrast, low self-image individuals who believe they are performing poorly will have their low self-image confirmed if sent to remedial training which will most likely result in low levels of self-

efficacy. Advanced training, on the other hand, implies that past performance has been more than adequate. High self-esteem persons are likely to maintain their already high levels of self-efficacy. Low self-image individuals assigned to advanced training, on the other hand, may question or discount the accuracy of this information and, therefore, maintain their initial low level of self-confidence (Noe, 1986). However, research has also tended to show that positive feedback, as implied in assignment to advanced training, is likely to raise an individual's level of confidence, regardless of their level of self-esteem (McFarlin & Blascovich, 1981). Therefore, low self-esteem individuals assigned to advanced training may actually show higher levels of self-efficacy than those assigned to remedial training. Therefore, it is argued that self-esteem is likely to moderate the relationship between training assignment and self-efficacy.

Conclusion. It has been argued that training assignment can affect self-efficacy. Furthermore, there is substantial evidence to suggest that self-efficacy is positively related to learning and training performance. When individuals have high levels of self-efficacy they persist longer during task performance. In short, self-efficacy is related to the amount of motivational energy that an individual expends toward task performance. Due to the importance of self-efficacy for training effectiveness, the current study examines the extent to which framing of training assignments affects pre-training self-efficacy. It is argued that attributions, locus of control, and self-esteem, are likely to be related to how individual's react to being assigned to differently framed training programs.

As stated earlier, self-efficacy is likely to affect training outcomes through its relationship with motivation (cf. Bandura & Cervone, 1986). A closer look at the literature on the effects of motivation on training outcomes is now presented.

Motivation

For a training program to be effective individuals must first master the trained material and then transfer this knowledge to the work situation (Ford et al., 1992; Noe, 1986). Traditionally, research on training effectiveness which has focused on learning outcomes has tended to rely on behavioristic/mechanistic views of human learning (Kraiger, Ford, & Salas, 1993). This view led researchers to focus on stimulus-response variables such as training design and delivery. As a consequence, individual differences related to training outcomes were often ignored. Recently, however, a shift toward more cognitive theories of training has occurred (cf. Cormier & Hagman, 1987).

A consequence of the cognitive perspective in training research is the recognition that individuals differ in how much they will learn and how they will react to training. This phenomenon is oftentimes referred to as an aptitude-treatment interaction (cf. Kanfer & Ackerman, 1989). Thus, characteristics such as ability, motivation, and attitudes that individuals bring to the training setting can interact with different training program designs to determine training outcomes.

The concept of trainability captures the essence of this paradigm shift. Individual differences in ability and motivation determine an individual's trainability, or their capacity and willingness to learn the trained material (Noe, 1986; Robertson & Downs, 1989). Individual differences in cognitive ability are believed to be crucial in determining the extent to which an individual can master the training content (Ree & Earles, 1991). However, individual differences in ability are usually believed to be relatively stable (Ackerman, 1987). Pre-training context factors are more likely to influence more fluid aspects of individual characteristics, namely motivation and attitudes.

Noe (1986) proposed a model which suggests that more variable aspects such as trainee motivation and attitudes can play an important role in determining training effectiveness. He contends that even though individuals may have the ability to master the

training content they may fail to do so because of lack of motivation. In addition, Noe proposes that individual difference variables such as locus of control, career involvement as well as environmental characteristics can have an impact on a trainee's pre-training motivation.

In a test of the Noe (1986) model, Noe & Schmitt (1986) investigated pre-training factors in a training program designed to improve the administration and interpersonal skills of educators. The results provided little support for the relationship between pre-training motivation and training outcomes. In addition, factors which were hypothesized to influence pre-training motivation were not found to be significantly related to pre-training motivation. Even though the study failed to support the importance of pre-training motivation as a component in training, severe methodological problems limit the ability to generalize the findings. Specifically, the study was composed of only 60 trainees. This small sample provided little power to detect significant paths in their path-analytic model.

Facteau et al. (1992) conducted a further test of the Noe (1986) model. Managers and supervisors (n=967) employed by a large southeastern state government served as the participants in the study. The results of LISREL structural equations analyses revealed that motivation to learn was positively related to transfer of learned skills to the job. In addition, a number of environmental variables (intrinsic incentives, compliance) as well as career planning were related to motivation to learn.

A study by Baldwin, Magjuka, & Loher (1991) found that trainees with higher levels of pre-training motivation showed higher learning during a performance appraisal training program. Tannenbaum et al. (1991) found that Naval Recruits reporting higher levels of pre-training motivation had higher levels of academic and physical self-efficacy at the end of training. Similarly, Mathieu, Tannenbaum, & Salas (1992) found that training motivation was related to the amount of learning at the end of training.

The evidence suggests that pre-training motivation is a potential determinant of training outcomes such as behavior and learning. The role of motivation in learning, however, is quite complex. While motivation prior to learning may be beneficial in focusing an individual's attention toward the training program, motivational interventions during training may actually decrease learning (Kanfer & Ackerman, 1989). In general, however, it appears that individuals who enter a training program with a willingness and confidence to do well tend to do better in the training program. Thus, one of the ways in which pre-training context can affect training outcomes is through its influence on motivation.

In summary, the framing of the training program can provide feedback regarding a trainee's past behavior. The attributions that are made based on this feedback can then determine the extent to which self-efficacy is enhanced or diminished. Self-efficacy, in turn, will affect the trainee's motivation level going into the training program. However, while individuals use feedback to make judgments regarding future performance, they are not passive recipients of this feedback. They hold prior beliefs about how well they are doing which may or may not be consistent with the feedback provided by training assignment. A possible outcome of this inconsistency is that trainees may perceive that the system used to make training assignments is unfair and therefore leads to lower motivation to learn.

Fairness Perceptions

It has been argued that individuals are not passive recipients of training assignments. Individuals are likely to hold prior beliefs regarding the type of training assignment they expect. However, if these expectations are violated, it is likely that trainees will question the fairness of these training assignments. There are no published studies in the training literature which deal with perceptions of fairness of training

assignments. While it can be argued that fairness perceptions are a form of training reactions as described by Kirkpatrick (eg. 1967), fairness perceptions represent a specific affective response regarding assignments and not just overall reactions to the content of the training program. Furthermore, fairness perceptions are likely to be formed prior to attending the training program whereas training reactions are formed after the individual has completed the training program.

Two dimensions of fairness perceptions have been distinctly outlined in the literature. Distributive justice refers to perceptions regarding decision outcomes (e.g. assignments) whereas procedural justice refers to the procedures used to make these decisions (Greenberg, 1987; 1990). Procedures are judged to be fair when they (1) follow consistent rules, (2) are based on accurate information, (3) employ safeguards against bias, (4) allow for appeals to be heard, and (5) are based on prevailing moral and ethical standards (Leventhal, 1980). In a training context, procedural justice refers to the procedures used to assign individuals to different training programs. This might be a test or the judgement of a supervisor. Distributive justice relates to actual assignments made. While conceptually different, past research has tended to confound measures of procedural and distributive fairness thus making it difficult to examine the effect of each on outcomes of interest (Hattrup, 1992).

In a training context, trainees may question the fairness of the procedure used to assign them to training as well as the outcome, or actual program to which they are assigned. Past research has shown that perceptions of procedural justice are often associated with perceptions of distributive justice (Folger & Greenberg; Greenberg, 1990; Leventhal, 1980). However, as stated earlier, this overlap may be due to measurement problems. There is research which suggests that individuals may accept an outcome which they judge to be unfair if they perceive the procedure used to arrive at the outcome to be fair (Leung & Li, 1990).

Fairness perceptions have been related to affective as opposed to performance outcomes. For example, researchers have noted a relationship between fairness perceptions and organizational commitment and satisfaction (Folger & Konovsky, 1989; Fryxell & Gordon, 1989). It is for this reason that fairness perceptions are likely to be related to affective responses to the training program as opposed to actual training performance. However, since these perceptions will be formed prior to training attendance, it is possible that negative perceptions of fairness may result in lower pre-training motivation and thus affect performance indirectly.

Framework for the Current Research

From the literature cited, it is clear that a number of factors present prior to an individual entering a training program can have an impact on how well the trainee performs during training. The present study examines the extent to which pre-training context influences pre-training self-efficacy, attitudes, and motivation, and, in turn, training outcomes. Specifically, it is argued that assigning an individual to a training program can communicate information regarding past performance. The way in which the training is framed, remedial as opposed to advanced, can provide this feedback information.

While some studies have begun to investigate the role of pre-training context, no attention has been paid to the information that assignment to a training program can communicate to a trainee. Furthermore, research on the consequences of feedback in training has not incorporated assignments as a form of feedback (cf. Martocchio & Webster, 1992). Given the potential negative effects of assignment to differently framed training programs it is argued that further research is needed to address this concern.

Noe (1986) as well as Baldwin & Ford (1988) have both echoed the need to understand the influence of pre-training factors on training outcomes. Noe (1986)

suggested that motivation is a critical pre-training characteristic which is potentially affected by pre-training context. Martocchio (1992) further suggests that pre-training context can affect an individual's level of self-efficacy going into training. Social cognitive theory provides a framework for linking performance feedback with subsequent task performance (Bandura, 1991). The current study extends this research by examining the extent to which training assignment affects an individual's pre-training self-efficacy and motivation. In addition, individual differences which could potentially moderate the effects of context are also examined.

Pre-Training Context

The current study takes the perspective that context serves to focus an individual's attention to their past performance as well as other aspects of the self such as how likely they are to perform well during training. This framing is believed to set off a series of cognitive processes such as attributions which can ultimately affect a trainee's self-efficacy and motivation prior to entering the training program. Research has consistently shown that self-efficacy and motivation are important pre-training characteristics which are related to training outcomes (cf. Baldwin, Magjuka, & Loher, 1991; Gist, Stevens & Bavetta, 1991). However, research on the effects of context, specifically framing, is lacking.

An unexplored consequence of context is the extent to which it conveys information that is consistent with or violates a trainee's self-concept. Organizations may be unaware of this potential side-effect of sending their workers to a training program. Threats to the self-concept can have powerful effects on an individual's motivational as well as affective states (cf. Dipboye, 1977; Swann, 1990). This study further expands the research on pre-training context by examining the role of self-concept as it relates to training assignment.

Training Outcomes

Traditional training studies have focused on Kirkpatrick's (1959; 1960) training criteria for evaluating training outcomes. These criteria include reactions, learning, behavior, and results. While arguments have surfaced regarding the exact relationship among these criteria (cf. Alliger & Janak, 1989), they are still considered appropriate for evaluating the effectiveness of a training program. Kraiger, Ford, & Salas (1993) argue that attitudinal as well as cognitive measures may also expand our understanding of the effects of training. In addition, the level of confidence or self-efficacy that a trainee leaves with has a large impact on how well they transfer the learned information back on the job (Ford et al., 1992). Furthermore, affective responses to training can have an impact on employee morale, commitment, and attitudes toward their work; all of which can affect productivity.

The present study focuses on two general types of outcomes. These include performance and affective training outcomes. Performance outcomes are those which are related to an individual's ability to perform the particular task for which they were trained. These outcomes include learning, behavior, and actual task performance. Research suggests that pre-training motivation is likely to have a direct impact on these performance outcomes (Noe, 1986).

The second type of training outcomes examined are affective outcomes. These include training reactions and post-training self-efficacy. Reactions has oftentimes been the only training outcome measured (Goldstein, 1992). However, little is known regarding the relationship between pre-training characteristics and performance outcomes on training reactions. In other words, is an individual's impression of the training program formed prior to , or as a result of, training? In addition, current research has recognized that an individual's perceptions of future performance, or self-efficacy, is an important training outcome (Mathieu, Martineau, & Tannenbaum, 1993; Tannenbaum et al. 1991).

Individuals who leave training with higher levels of self-efficacy are more likely to show transfer from training to the job (Ford et al., 1992; Gist, Stevens, & Bavetta, 1991).

Individual Differences

Little research exists on the extent to which individuals react differentially to pre-training context factors. The present study examines the extent to which locus of control attributions, and self-concept moderate the effects of framing. Martocchio & Webster (1992) found some evidence for the hypothesis that not all trainees react equally to feedback given during training. The current study extends this research by examining the moderating effects of individual differences in interpreting the pre-training environment.

Since it is believed that context serves to focus attention to feedback regarding past performance as well as the likelihood of success in training, individual differences which could potentially affect how this information is interpreted are investigated. Locus of control has been shown to influence the attributions individuals make when they receive performance feedback (Spector, 1982). These attributions play a role in determining an individual's level of self-efficacy (Gist & Mitchell, 1992).

In addition, assignment to a training program can threaten or confirm one's self-concept. High self-esteem individuals are more likely to maintain high levels of self-efficacy, especially in the face of disconfirming evidence such as assignment to remedial training. Low self-esteem individuals, on the other hand, may benefit from the positive feedback implied by assignment to advanced training but be crushed when faced with self-confirming information conveyed by assignment to remedial training.

The following section presents the conceptual model developed for the current study. The model specifies the linkages among the constructs examined. Specific hypotheses derived from this model are discussed.

A Conceptual Model

Figure 1 presents the conceptual model developed for the present study. This model adds to the training literature in a number of ways. First, the model clearly outlines the mechanisms by which pre-training context leads to training outcomes. Secondly, the model proposes a number of individual differences which are believed to moderate the relationship between pre-training context and motivational and affective outcomes. Past research on context effects has tended to ignore the role of individual differences. In general, the proposed model incorporates motivational, affective, and individual difference factors into a comprehensive model that reflects our understanding of the role of context in affecting training effectiveness.

Two types of hypotheses can be derived from the proposed model. The first are what can be called "Moderating Hypotheses". These hypotheses state that individual characteristics can affect the nature of the relationship between training assignments and pre-training attitudes and motivation. Secondly, the model proposes that pre-training attitudes and motivation will affect various training outcomes. In other words, the model proposes that, independent of the quality of the training program, an individual's attitudes and motivation can have an influence on the effectiveness of the training program. Since these hypotheses relate to the structure of the relationships between pre-training characteristics and training outcomes, these will be called "Structural Hypotheses". Each will be discussed in turn.

Moderating Hypotheses. The framing of training assignments are hypothesized to affect pre-training characteristics by providing feedback regarding past performance. This feedback is hypothesized to influence two mechanisms. These include attitudes toward the training assignment and expectancies regarding future performance or self-efficacy. This framework is consistent with the arguments developed earlier which suggest that training is an activity which is embeded within a larger organizational reality. Circumstances

surrounding the assignment to training can set up a context which can influence how a trainee approaches the training program. However, not all trainees will react in a similar fashion to the same training assignment.

First, individual differences will moderate the relationship between training assignments and pre-training self-efficacy. Particularly, an individual's attributions regarding their level of past performance which led to their training assignment are likely to result in different levels of self-efficacy. Those who attribute their past performance to internal causes (effort, ability) or external stable causes (task difficulty) are likely to show lower levels of self-efficacy when assigned to remedial training that those making similar attributions who are assigned to advanced training (Bandura, 1977; Gist & Mitchell, 1992; Weiner, 1985).

Locus of control is an individual difference variable which describes an individual's propensity to make internal vs. external attributions (Rotter, 1966; Spector, 1982). Therefore, locus of control, through its influence on attributions, is likely to moderate the relationship between training assignments and pre-training self-efficacy. Past research has shown than internal locus of control people tend to be more affected by feedback (Spector, 1982). Therefore training assignment may have stronger consequences for internal as opposed to external locus of control individuals. Externals are less likely to see a connection between their actions and observed outcomes and, therefore, show little differences in self-efficacy as a result of training assignments. Stated explicitly:

> H1: Locus of control will moderate the relationship between training assignment and pre-training self-efficacy (see Figure 2). Internal locus of control individuals will show higher levels of pre-training self-efficacy when assigned to advanced training than to remedial training. Those with an external locus of control will be relatively unaffected by their training assignment.

Training assignments are also likely to have an effect on pre-training self-efficacy to the extent that it confirms or disconfirms the trainee's perceptions of him or herself. Those

with high levels of self esteem will be less affected by training assignments. These individuals are more likely to believe that they perform well in any situation and therefore maintain high levels of self-efficacy, even in light of an assignment to remedial training (Carver & Scheier, 1990; Swann, 1990). However, low self-esteem individuals may be most affected by the framing of their training assignment. Assignment to advanced training is likely to result in a boost in confidence by signaling to the individual that they can actually perform this task well. However, assignment to remedial training will confirm an already low self-image and result in low levels of self-efficacy. Stated explicitly:

> H2: Self-esteem will moderate the relationship between training assignment and self-efficacy (see Figure 3). Individuals with a positive self-esteem will maintain relatively high levels of self-efficacy regardless of their training assignment. On the other hand, low self esteem individuals assigned to advanced training will report higher levels of self-efficacy than those assigned to remedial training.

Secondly, training assignment is likely to affect training outcomes through an individual's perceptions of fairness regarding their training assignment. However, not all individuals will perceive the fairness equally. Their beliefs regarding the training assignment which they should receive (as a function of their perceptions of past performance) are likely to moderate the effects of training assignments on fairness perceptions. Individuals who believe that their past performance has been adequate, and believe they should be assigned to advanced training, are likely to have more negative perceptions of the outcome (training assignment) and the process (Training Assignment Test) than those assigned to advanced training. This will result in lower levels of procedural and distributive justice perceptions.

On the contrary, those who believe their past performance has been poor, and believe they should be assigned to remedial training, are likely to question the fairness of the outcome and process when assigned to advanced training. However, when assigned to

remedial training, they are likely to have positive perceptions of both distributive and procedural justice. Stated explicitly:

> H3: Perceived performance will moderate the relationship between training assignment and perceived fairness of assignment (see Figure 4). Individuals who believe they are performing well and are assigned to remedial training will report low levels of distributive and procedural justice as compared to those assigned to advanced training. Similarly, those who believe they are performing poorly and are assigned to advanced training will also report low levels of distributive and procedural justice as compared with those assigned to remedial training.
>
> H4: Expected assignment will moderate the relationship between training assignment and perceived fairness (see Figure 5). Training assignments which are different than expected assignments will result in lower levels of perceived fairness than when they are consistent with expected training assignments.

The Moderating Hypotheses presented above describe the mechanisms by which individuals will react to different frames associated with training assignments. The proposed model suggests that pre-training self-efficacy and fairness perceptions are the most immediate result of training assignments. Both of these variables are then hypothesized to set off a causal chain of events which lead to differences in performance and affective training outcomes. These hypotheses are discussed below.

Structural Hypotheses. The model hypothesizes that pre-training self-efficacy will have an effect on training outcomes through its influence on motivation to learn. Past research on self-efficacy has found it to be related to the amount of effort an individual expends on a particular task (Bandura, 1977; Bandura & Cervone, 1986; Gist & Mitchell, 1992). Those with higher levels of self-efficacy tend to spend more energy and remain engaged on a task longer than those low on self-efficacy.

In addition, fairness perceptions are also hypothesized to have an effect on motivation to learn. This particular effect of fairness perceptions has not been explicitly examined in the literature. However, the literature does suggest that negative fairness perceptions are related to commitment (Folger & Konovsky, 1989; Fryxell & Gordon,

1989). Therefore, those reporting low levels of distributive and procedural justice are hypothesized to report lower levels of motivation to learn. The following specific hypotheses are made regarding the relationships between pre-training self-efficacy, distributive, and procedural justice.

H5: Pre-training self-efficacy will be positively related to motivation to learn after accounting for the effects of fairness perceptions.

H6: Perceptions of distributive justice will be positively related to motivation to learn after accounting for the effects of pre-training self-efficacy and procedural justice.

H7: Perceptions of procedural justice will be positively related to motivation to learn after accounting for the effects of pre-training self-efficacy and distributive justice.

An individual's level of motivation has been shown to be related to various training outcomes. The proposed model hypothesizes that motivation to learn will have its most direct impact on performance outcomes. These are outcomes which require the individual to devote a substantial amount of attentional resources in order to benefit from training (Kanfer & Ackerman, 1989). Specifically, motivation to learn is likely to lead to differences in learning, performance, and behavioral outcomes of training.(Facteau et al., 1992; Baldwin, Magjuka, & Loher, 1991; Tannenbaum et al., 1991). Therefore, the following hypotheses can be made regarding the effects of motivation to learn on performance outcomes of training.

H8: Motivation to learn will be positively related to actual learning.

H9: Motivation to learn will be related to behavioral measures of training effectiveness.

H10: Motivation to learn will be positively related to post-training performance.

It is expected that these relationships will hold true after accounting for differences in pre-training self-efficacy, and fairness perceptions. In other words, the model proposes that motivation to learn is a mediating variable, therefore, its effect must be shown to hold true after accounting for the effects of other prior causes (James & Brett, 1984; James, Mulaik, & Brett, 1982). Thus, hypotheses 8 - 10 must be tested in conjunction with a test of mediation of motivation to learn. This test is discussed in more detail in the Analytic Strategy section.

Finally, affective outcomes of training are hypothesized to be a result of both performance outcomes, and fairness perceptions. In other words, an individual's reaction to training, and their resulting level of self-efficacy, will be a function of both, how well he/she performed as a result of training, and perceptions of fairness regarding training assignments. This suggests that training reactions are more than just a function of training design. How an individual felt about the training program prior to attendance will also play a part in their post-training reactions and self-efficacy. Thus the following hypotheses regarding affective outcomes are proposed.

H11: Fairness perceptions (distributive and procedural justice) will be positively related to training reactions.

H12: Learning will be positively related to training reactions.

H13: Behavioral outcomes of training will be positively related to training reactions.

H14: Post-training performance will be positively related to training reactions.

H15: Fairness perceptions (distributive and procedural justice) will be positively related to post-training self-efficacy.

H16: Learning will be positively related to post-training self-efficacy.

H17: Behavioral outcomes of training will be positively related to post-training self-efficacy.

H18: Post-training performance will be positively related to post-training self-efficacy.

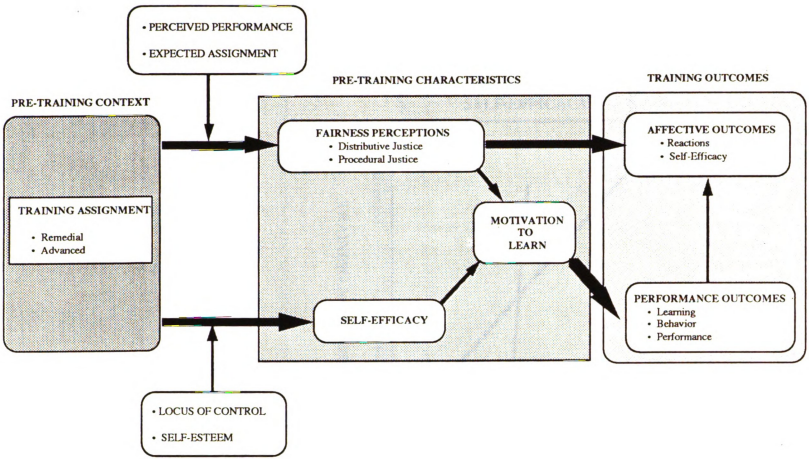

Figure 1. A Conceptual Model

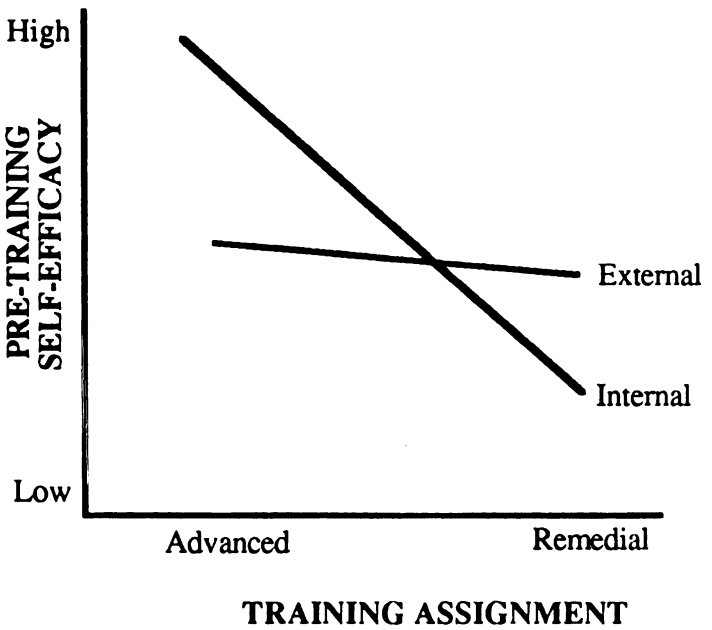

Figure 2. Hypothesized Relationship Between Training Assignment, Locus of Control, and Pre-Training Self-Efficacy

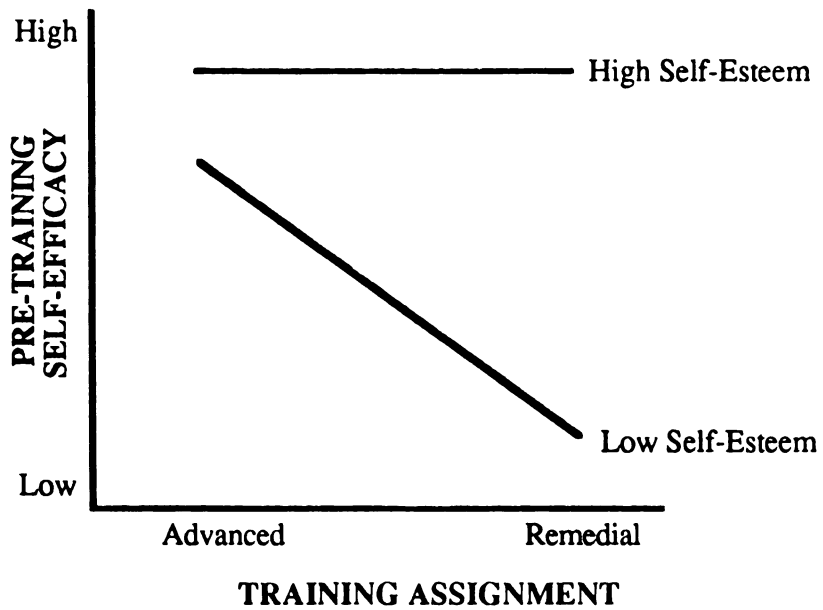

Figure 3. Hypothesized Relationship Between Training Assignment, Self-Esteem, and Pre-Training Self-Efficacy.

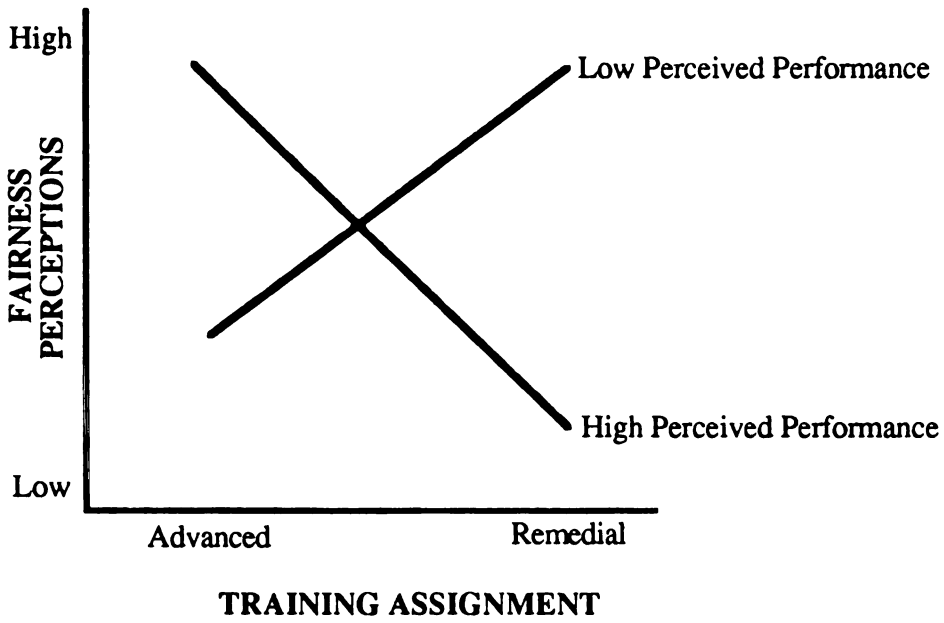

Figure 4. Hypothesized Relationship Between Training Assignment, Perceived Performance, and Fairness Perceptions.

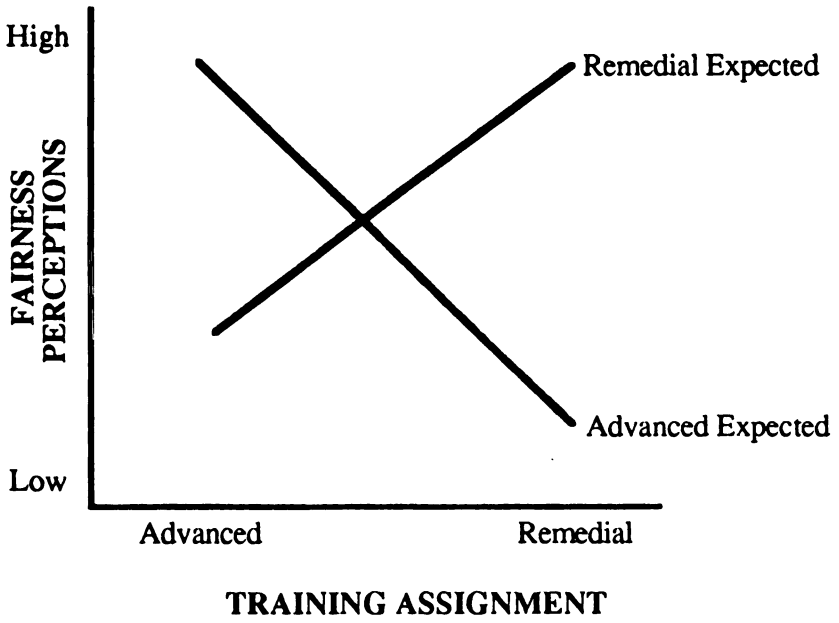

Figure 5. Hypothesized Relationship Between Training Assignment, Expected Assignment, and Fairness Perceptions.

METHOD

Participants

The participants for this study were 217 undergraduate psychology students at Michigan State University. The participants took part in the experiment as part of a course requirement. The participants were 64% female and 36% male.

Design

The current study employed a one-way experimental design containing three levels of a between-subjects variable. The manipulated variable involves the label given to the training program to which the participants were assigned (remedial, advanced, no label). The no label condition represents a control condition used as a reference for interpreting the results of the two labeled training conditions. A total of 163 individuals were assigned to the two experimental groups. The control group consisted of 54 individuals. A more detailed description of this manipulation is described in the Procedure section. The remaining variables involved measured as opposed to manipulated factors.

Task

The present study suggests that learning a new task is a function of attitudinal and motivational levels prior to entering a training program. The focus of the study is on the process involving training assignment and subsequent attitudes and motivational levels. Therefore, the choice of task was driven by concerns in capturing this process over any concerns to train people for "real world" skills. In order to capture the process in question

the task must have several properties. First, the task must be novel in order to avoid any confounds of prior experience. Even though randomization would help decrease this confound, prior experience could also serve to place a ceiling on performance and thus not allow for meaningful training effects. Second, the task must be complex enough to allow for changes in performance as a function of learning. In addition, the complexity of the task must allow for individual differences in performance. Third and most important, the task must be cognitively complex enough to require substantial attentional resources. The task should require individuals to be motivated enough to process the information and learn the task.

Given the above requirements, the task chosen for this study involved a multiple-cue probability learning task (cf. Stevenson, Busemeyer, & Naylor, 1990). This type of task requires that the participant make a decision based on the values of a number of cues (e.g. cost, manufacturer, etc). The correct decision is usually determined by the researcher by a combination of the cues and their values. The participant is asked to look at the values of all cues and make a decision based on their hypothesis about how the cues combine to determine the correct response (e.g. Brunswik, 1956). They are then given feedback as to the accuracy of their decision. This information then allows the participant to learn the correct decision from the cue values over a number of trials.

This type of task contains the necessary characteristics to examine the process by which training assignment leads to differences in training performance. Because the cues and cue values can be manipulated, the task is usually novel. Individual performance is determined by the extent to which the participant learns the proper combination of cue values which lead to a particular decision. Therefore, the participant must be cognitively engaged in the task. Any differences in attitudes and motivation which lead participants to pay less attention should result in differences in task performance. In addition, rules

relating to cue combination and strategies for arriving at the correct response can be taught thus allowing for the design of a training program.

The performance task used in this study was a computer Naval Air Defense simulation (Hollenbeck, Sego, Ilgen, & Major, 1991). This task requires individuals to command a US Naval vessel and make decisions regarding a series of "targets" presented on an IBM compatible microcomputer. The individual is asked to decide on a defensive posture (Ignore, Monitor, Warn, Lock-On, Defend) depending on 9 target characteristics or attributes (speed, altitude, size, angle, IFF, direction, corridor status, radar type, range). Each trial requires the individual to make a decisions within an allotted amount of time. However, if a decision is made sooner, another target can be assessed. In this way both the number of targets as well as well as the accuracy of decisions can be assessed when evaluating performance on the task.

The level of threat associated with a particular target depends on the values of the nine attributes. Four interactions among eight of the nine attributes exist which help determine the level of threat. The interaction indicates a threat if both of the attributes are threatening. If any of them is non-threatening the interaction becomes non-threatening. This added complexity requires the participants to not only know the level of threat for each attribute but also the interactions among the attributes (see Hollenbeck, Sego, Ilgen, & Major, 1991, for a more detailed explanation).

There are five possible outcomes possible during each trial of the simulation. These are: hit, near miss, miss, incident, and disaster. The particular outcome depends on the distance between the participant's decision and the correct decision. If the participant's decision is correct, they receive a "hit" for that trial. If the participant's decision is one level away from the correct decision (i.e. participant chose "ignore" when they should have "monitored") they receive a "near miss". A two level distance results in a "miss". Three

and four levels away from the correct decision results in an "incident" and a "disaster", respectively.

Point values are awarded for each outcome. A "hit" is worth 2 points, a "near miss" 1 point, a "miss" 0 points, an "incident" -1 points, and a "disaster" -2 points. A final score was computed by adding the total number of points received by the participant during each of the trials.

Training Course

The training course consisted of four sections. First, the participants reviewed the materials presented in the first experimental session which outlined the general instructions of the task. Second, the participants were instructed on the "inflection points" or the specific level when an attribute changes from non-threatening to somewhat threatening and from somewhat threatening to very threatening. Knowing these points helps one determine the levels of threat. Thirdly, they received instruction on strategies involving the measurement of the target attributes. Some of the attributes interact so the level of threat is determined by the combination of two target attributes. For example, a fast target is not threatening. However, a fast target headed toward the Carrier vessel group is very threatening. Given these interactions, the appropriate measurement strategy is to measure the characteristics that interact in their respective order. Finally, the participants received training on various "hot keys" which make the use of the keyboard to access the program considerably more efficient.

The participants read each section of the training manual (see Appendix A) and received oral instructions relating to the materials presented. After the last section, the participants were given a practice target to allow them to get comfortable with the keyboard and to get initial experience practicing the skills learned. The entire training course lasted around 45 minutes.

Measures

The following measures were collected as part of this investigation. The measures are listed in the order in which they were collected. Where appropriate, scale reliabilities reported are for the experimental groups only (n=163). Participants in the control group responded to a few relevant measures. Experimental and control group scale statistics will be described more fully in the "Results" section. Table 1 presents an overview of the measures collected from the experimental and control groups.

Locus of Control. Locus of control was measured using a revised version of Rotter's (1966) 29-item scale developed by Andrisani and Nestle (1976). This is an 11-item Likert scale and was shown to be reliable by Noe and Schmitt (1986). The observed reliability for this scale was $\alpha = .65$ for 96 of the participants. The scale was coded so that high scores represent an internal orientation. A copy of this scale can be found in Appendix B.

Because of the low reliability of the 11-item locus of control scale, the original scale developed by Rotter (1966) was used for the last 67 participants (see Appendix C). This scale contains 23 forced-choice items with 6 filler items. Two items were deleted resulting in a 21 item scale. The observed reliability of this scale was $\alpha = .71$. Because two different scales were used to measure locus of control, the analyses for this variable were conducted twice; once for each scale.

Self-Esteem. Self-esteem was assessed using Rosenberg's (1965) 10-item scale. This scale measures an individual's overall sense of self-worth and confidence. Past research has demonstrated this scale to be reliable in a number of settings (e.g. Pelham & Swann, 1989; Hattrup, 1992). The observed scale reliability was $\alpha = .82$. A copy of this measure can be found in Appendix D.

Table 1

Overview of Study Variables

	EXPERIMENTAL	CONTROL
SESSION 1		
Self-Esteem	X	X
Locus of Control	X	X
Pre-Training Knowledge	X	X
Pre-Training Performance	X	X
SESSION 2		
Perceived Performance	X	
Expected Assignment	X	
Attributions	X	
Distributive Justice	X	
Procedural Justice	X	
Pre-Training Self-Efficacy	X	X
Motivation to Learn	X	X
Post-Training Knowledge	X	X
Post-Training Performance	X	X
Learning	X	X
# Trials	X	X
Behavior	X	X
Accuracy	X	X
Post-Training Self-Efficacy	X	X
Reactions	X	X

Pre-Training Knowledge. Knowledge regarding threat levels and combination rules for the nine target attributes gained during the initial pre-training introduction session, and prior to participants receiving training, was assessed by a 20-item knowledge test. All items employed a multiple-choice (5 options) format. This measure was adapted from Major (1992). The split-half reliability (odd-even) was $r = .70$.. A copy of this measure can be found in Appendix E.

Pre-Training Performance. A paper-and-pencil simulation of the Air Defense Task was used to assess the participants application of their initial level of knowledge about the Air Defense Task (see Appendix F). The participants were presented with all 9 target attributes and asked to indicate the appropriate defensive posture. The targets varied in difficulty from very easy targets (clearly threatening or non-threatening) to very difficult (very complex interactions). The participants assessed a total of 10 targets. The sum of the points received for each of the 10 targets was used as the measure of performance. The possible range for this measure is -20 to +20. The observed split-half reliability (odd-even) was $r = .40$.

Perceived Performance. Participants responded to a 5-item scale measuring the participant's perceived level of performance on the Training Assignment Test. Participants indicated their level of agreement with each item using a 5-point Likert scale. Appendix G presents the perceived performance scale. The scale reliability was $\alpha = .90$.

Expected Assignment. Participants were asked to indicate which training program they expect to be assigned to (remedial vs. developmental) given their perceived level of performance on the TAT. This single-item measure can be found in Appendix H.

Attributions. Four major types of attributions described by Weiner (1985) were measured. These include luck, effort, task difficulty, and ability. The participants were asked to indicate the extent to which luck, effort, task difficulty, and ability caused their level of performance on the TAT. The first 93 participants responded to one item for each

of the four dimensions. For the last 69 participants, four additional items per dimension were added (see Appendix I). The scale reliabilities based on these 69 participants were α = .77, α =.86, α = .71, α = .72 for luck, effort, task difficulty, and ability attributions, respectively.

Pre-Training Self-Efficacy. A 10 item scale adapted from Hattrup (1992) was used to measure an individual's expectations regarding their future level of performance on the Air Defense Task. Participants responded to 10 items using a 5-point Likert scale. The observed scale reliability was α = .89. This measure can be found in Appendix J.

Fairness Perceptions. A 20-item scale was used to assess the participants perceptions of fairness regarding the training assignment. Two dimensions of fairness perceptions, distributive (10 items) and procedural (10 items) justice, were assessed by the instrument (Hattrup, 1992). The participants indicated their level of agreement with each item on a 5-point Likert scale. Item and factor analyses resulted in the elimination of 1 item from each of the 2 measures. The scale reliabilities for the resulting 9-item measures were α = .92 and α = .83 for distributive and procedural justice, respectively. This scale can be found in Appendix K.

Motivation to Learn. A 10-item scale was developed to assess participant's motivation to learn the material presented in the training program. These items are similar to those used by Noe & Schmitt (1986). Participants indicated their level of agreement with each item using a 5-point Likert scale. The scale reliability was α = .93.The motivation to learn scale can be found in Appendix L.

Post-Training Knowledge. Knowledge regarding scale threat values and interactions at the end of training was assessed by the same 20-item Pre-Training Knowledge measure. By using the same measure, pre- and post-training scores can be compared. The split-half reliability (odd-even) reliability was r = .73.

Post-Training Performance. After receiving training, the participants responded to the same 10-target paper-and-pencil simulation of the Air Defense Task as on the Pre-Training Performance measure. Performance scores were computed in a similar fashion. The split-half reliability (odd-even) was $r = .56$.

Post-Training Self-Efficacy. The participants' expectations regarding their future performance level on the Air Defense Task was measured by a 10-item scale similar to the pre-training self-efficacy measure. The scale reliability was $\alpha = .88$.

Learning. The extent to which participants learned the training material was assessed via a 13-item knowledge test. While comparing pre- and post-training knowledge can also serve as a way of assessing learning, this measure covers the unique material developed for the training program beyond the material presented in the introductory session (see Sections 2-4 of the Training Manual in Appendix A). The split-half reliability (odd-even) was $r = .82$. A copy of this learning measure can be found in Appendix M.

Number of Trials. The number of trials completed by the participant in the 40 minute time period allowed was collected by the computer simulation. There were a total of 35 targets in the simulation target set. Therefore, scores on this measure could range from 0 to 35. Because of a computer malfunction during data collection, this measure was collected on only 67 of the 163 experimental, and 17 of the 53 control group participants.

Accuracy. The accuracy of the participants' responses during the computer simulation was assessed using the point system described above. For each individual trial, scores could range from +2 to -2 depending on the distance between the participant's response and the correct response. Accuracy scores were computed by summing the number points across trials and dividing by the number of trials. The resulting measure also had a possible range of +2 to -2. This measure was only available for a subset of the participants as indicated above.

Behavior. Participants can choose to measure as many or few target attributes as they wish. However, the overall target threat level is determined by 4 interactions among 8 target attributes. This was a point which was covered during the training program. If the individual applies the training to the task, they should measure all nine attributes. A behavioral measure of training outcome was developed by counting the number of interactions actually measured by the participant prior to rendering a judgment. This information was collected by the computer program and listed for each of the targets assessed by the participant.

Scores on this measure were computed by adding the number of interactions measured for each trial (out of 4 possible) and summing across all trials. Because the number of trials varied across participants, an average was computed by dividing the total interactions by the number of trials completed. Possible scores could range from 0-4. This measure was only available for a subset of the participants as indicated above

Reactions. A 10-item scale was developed to measure participants' attitudes regarding the quality and usefulness of the training program. Participants indicated their level of agreement with each item using a 5-point Likert scale. Item and factor analyses resulted in the elimination of 1 item. The resulting scale reliability was α = ..80. This scale can be found in Appendix N.

Procedure

The participants took part in two experimental sessions. During the first session approximately 30 participants reported to a large classroom. Upon arrival to the experimental site, the participants were asked to read and sign a brief consent form informing them of the voluntary nature of their participation and the sorts of activities that they would be performing during both experimental sessions (see Appendix O). At this time the participants completed the Locus of Control and Self-Esteem measures.

The participants were then given a brief oral introduction to the Air Defense Task. An instruction manual developed by Major (1992) summarizing the task as well as the descriptions of the various target characteristics was then provided to the participants (see Appendix P). The experimenter then informed the participants that the study was being conducted in order to examine the effectiveness of two specially designed training programs. They were told that their performance on a Training Assignment Test (TAT) will determine their training assignment. This test contained the Pre-Training Knowledge and Pre-Training Performance measures.

The participants were told that past research had shown that some individuals tend to perform extremely well on this test while others have tended to do fairly poorly. However, two training programs have been specifically designed for each of these two types of individuals. The participants were told that if they perform worse than average on the test they will be assigned to remedial training. This training program has been specifically designed to help those who are obviously deficient in the basic skills involved in performing the Air Defense Task. If they perform above average, they were to be assigned to advanced training. The control group was simply told that they were to fill out a knowledge test and sign up for a subsequent training session.

After they had ample time to review these materials (15 minutes), the participants were then allowed to ask any questions they might have regarding the information presented to them. They were then administered the Training Assignment Test. After they completed the test they were asked to hand in all materials and sign up for a subsequent session in which they were to receive their training assignment and allowed to work on the Air Defense Task. The second session was conducted the following week.

For the second session, participants reported to the computer site in groups of 2-9 individuals. Upon their arrival they were reminded that the results of the Training Assignment Test which they took at the previous session were being used to make training

assignments. They then filled out the Perceived Performance as well as the Expected Assignment scales. The experimenter then read off the names of the individuals assigned to remedial training (for half of the sessions the advanced group was assigned first). Both groups were then escorted to their respective rooms. Participants in the control group were simply escorted to the training room.

Upon arrival to the training room, the participants completed the Perceived Fairness, Pre-Training Self-Efficacy, Attributions, and Motivation to Learn measures. The control group completed the Pre-Training Self-Efficacy and Motivation to Learn measures only. At this point the training course was presented. The training manuals were labeled "Advanced" or "Remedial" depending on the assignment. Even though the courses were labeled differently, the content of the course was exactly the same.

At the end of training, the participants completed the Post-Training Knowledge and Post-Training Performance measures. They were then given 40 minutes to work on the computer simulation. They were instructed that they could record a judgment at any time during a trial. However, they must render a judgment within 180 seconds. They were to examine as many targets, as accurately as possible.

At this point the experiment was finished and the participants were thoroughly debriefed (see Appendix Q). Special attention was paid to ensure that the participants understood that their training assignment was randomly determined and that it in no way reflected their level of performance on the Training Assignment Test. They were then instructed not to discuss this experiment with anyone else until all necessary participants had been obtained.

Analytic Strategy

The analytic strategy for this study followed the logic of the causal direction hypothesized by the model in Figure 1. The moderating hypotheses were tested first,

followed by the structural hypotheses. Individuals in the experimental groups were used for these analyses (n = 163). Moderation was tested using multiple regression (Cohen & Cohen, 1981). A cross-product term is formed by multiplying the two independent variables together. The dependent variable of interest is then regressed on the two independent variables as well as the cross-product term. A significant regression weight for the cross-product term indicates the presence of an interaction.

In order to determine the direction of the interaction, the regression equation was recast into a simple-slope equation (see Aiken & West, 1991). This procedure allows one to plot the relationship between one of the independent variables and the dependent variable as a function of values of the second independent variable.

The second set of analyses involved tests of the structural hypotheses concerning the effects of self-efficacy, procedural justice, and distributive justice, on motivation to learn. Multiple regression was used to test this set of hypotheses (Cohen & Cohen, 1981). Motivation to learn was regressed on self-efficacy, procedural justice, and distributive justice in order to determine if these variables had a non-zero regression weight.

The third set of analyses involved tests of the mediation hypotheses implied by the causal order in the model. The model hypothesizes that motivation to learn mediates the relationship between pre-training self-efficacy and training outcomes. A test of mediation was conducted to test this hypothesis (James & Brett, 1984). Evidence for mediation exists when motivation to learn adds prediction of the dependent variable above and beyond that accounted for by pre-training self-efficacy, distributive, and procedural justice. In addition, pre-training self-efficacy, distributive, and procedural justice should not add any significant increase in prediction above that of motivation to learn. This strategy allows for the examination of both, the mediated relationship hypothesized by the model, as well as the specific relationships between motivation to learn and performance outcomes.

The final set of analyses tested the hypothesized relationships between performance outcomes, fairness perceptions, and affective outcomes. To test this set of hypotheses, training reactions were regressed on performance outcomes and fairness perceptions. The extent to which these predictors have significant regression weights indicates that they have a unique effect on training reactions. A similar analysis was conducted with post-training self-efficacy.

In addition to the tests of the hypotheses outlined above, exploratory analyses were conducted to compare the effects of labeling against an unlabeled, or control, group. These comparisons were carried out separately for each of the pre-training characteristics (except fairness perceptions), performance, and affective outcomes. Even though the effects of framing were hypothesized to be moderated by a number of individual characteristics, these analyses allowed for the exploration of any overall effects that framing has as compared to an unframed group.

These analyses were conducted using multiple regression techniques. Group membership was dummy coded using two variables (see Cohen & Cohen, 1983). A variable called "Advanced" was coded as 1 for the advanced group and 0 for the remedial and control groups. A variable called "Remedial" was coded as 1 for the remedial group and 0 for the advanced and control group. Each of the dependent variables of interest was then regressed on these two dummy variables. The regression weights associated with these two variables serve as a test of the difference between the respective group, and the control group. Negative weights reflect lower means whereas positive weights reflect higher means than the control group (see Cohen & Cohen, 1983).

RESULTS

Descriptive Data

Table 2 presents the means, standard deviations, and scale reliabilities for the experimental groups. Table 3 presents the control group descriptive data. In general, the scales showed sufficient reliabilities to proceed with the data analyses with the exception of both pre- and post-training performance. The scales also showed sufficient range and there appeared to be no problems associated with floor or ceiling effects. An exception is the self-esteem scale. In general, the participants reported high levels of self-esteem (mean = 4.11 on a 5-point scale). The intercorrelations among the variables can be found in Table 4 for the experimental groups, and in Table 5 for the control group.

Moderating Hypotheses

The model suggests that the framing of training assignments influence training outcomes through their effects on pre-training characteristics. Given the causal flow of the model, the factors which are related to these pre-training characteristics were first examined. The first set of hypotheses pertained to the moderating effects of locus of control, self-esteem, perceived performance, and expected assignment on pre-training self-efficacy and fairness perceptions.

Table 2

Means, SDs, and Reliabilities of Study Variables: Experimental Groups

VARIABLE	# ITEMS	MEAN	SD	RELIABILITY
Self-Esteem	10	4.11	.53	.82
Locus of Control 1 [a]	10	3.48	.47	.65
Locus of Control 2 [b]	21	10.38	3.80	.71
Perceived Performance	5	2.68	.82	.90
Expected Assignment [c]	1	.74	.44	.---
Luck Attributions [a]	5	2.44	.78	.77
Effort Attributions [a]	5	3.47	.90	.86
Task Difficulty Attributions [a]	5	3.15	.77	.71
Ability Attributions [a]	5	2.60	.84	.72
Pre-Training Self-Efficacy	10	3.49	.66	.89
Distributive Justice	9	3.51	.69	.92
Procedural Justice	9	3.26	.50	.83
Motivation to Learn	10	3.81	.64	.93
Pre-Training Knowledge	20	11.44	3.00	.70 [d]
Post-Training Knowledge	20	13.17	2.90	.73 [d]
Pre-Training Performance	10	11.10	3.02	.40 [d]
Post-Training Performance	10	11.55	2.97	.56 [d]

Note. n = 163.

[a] n = 95. [b] n = 68. [c] Coded: 0 = Advanced, 1 = Remedial. [d] Split-half reliability estimate (odd-even). All others are coefficient alpha.

Table 2 (cont'd)

VARIABLE	# ITEMS	MEAN	SD	RELIABILITY
Post-Training Self-Efficacy	10	3.79	.53	.88
Learning	13	9.84	2.59	.82 [d]
# Targets [b]	---	26.46	5.42	.---
Accuracy [b]	---	1.29	.27	.---
Behavior [b]	---	2.78	1.02	.---
Reactions	9	3.74	.50	.80

Note. n = 163.

[a] n = 95. [b] n = 68. [c] Coded: 0 = Advanced, 1 = Remedial. [d] Split-half reliability estimate (odd-even). All others are coefficient alpha.

Table 3

Means, SDs, and Reliabilities of Study Variables: Control Group

VARIABLE	# ITEMS	MEAN	SD	RELIABILITY
Self-Esteem	10	4.15	.58	.86
Locus of Control 1 [a]	10	3.40	.48	.65
Locus of Control 2 [b]	21	10.38	3.80	.71
Pre-Training Self-Efficacy	10	3.68	.56	.88
Motivation to Learn	10	4.09	.53	.92
Pre-Training Knowledge	20	11.43	3.06	.71 [c]
Post-Training Knowledge	20	13.26	2.93	.74 [c]
Pre-Training Performance	10	11.74	2.65	.44 [c]
Post-Training Performance	10	11.40	2.93	.48 [c]
Post-Training Self-Efficacy	10	4.07	.61	.91
Learning	13	9.60	2.57	.68 [c]
# Targets	---	24.88	5.69	.---
Accuracy	---	1.30	.22	.---
Behavior	---	2.69	.91	.---
Reaction	9	3.97	.59	.83

Note. n = 54

[a] n = 36. [b] n = 18. [c] Split-half reliability estimate (odd-even). All others are coefficient alpha.

Table 4

Intercorrelations Among Study Variables: Experimental Groups

VARIABLE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Assignment [a]	(.--)																		
2. Self-Esteem	-.06	(.82)																	
3. Locus of Control 1 [b]	.00	.19	(.65)																
4. Locus of Control 2 [c]	.14	.18	.--	(.71)															
5. Perc. Perf.	-.01	.08	-.03	-.11	(.90)														
6. Exp. Assign. [a]	.02	-.12	.16	.05	-.60*	(.--)													
7. Luck Attrib.	-.13	-.07	-.23*	-.13	-.37*	.32*	(.77)												
8. Effort Attrib.	-.04	-.09	-.04	.33*	.14	-.11	-.24*	(.86)											
9. Task Diff. Attr.	.10	.08	.06	-.08	.04	.04	.06	.04	(.71)										
10. Ability Attrib.	-.26*	-.06	-.28*	-.17	.16	-.08	-.05	.23*	.19*	(.72)									
11. Pre-Tr. Self-Eff.	-.12	.20*	.19	-.11	.51*	-.47*	-.37*	.12	-.06	.01	(.89)								
12. Distrib. Just.	.25*	.14	.04	.10	-.01	.07	-.20*	.42*	.17*	-.02	-.07	(.92)							
13. Proced. Just.	.00	.04	-.01	.05	.11	-.02	-.11	.28*	.10	.06	.02	.50*	(.83)						
14. Mot. to Learn	.07	.17*	.22*	-.02	.36*	-.29*	-.20*	-.03	.13	-.12	.28*	.19*	.20*	(.93)					
15. Pre-Tr. Knowl.	-.03	.06	.05	.05	.36*	-.39*	-.24*	.15	.15	.09	.19*	.07	.20*	.39*	(.70)				
16. Post-Tr. Knowl.	.05	.03	.21*	.13	.22*	-.21*	-.19*	.07	.11	.10	.10	-.06	.02	.31*	.63*	(.73)			
17. Pre-Tr. Perf.	.03	.08	-.10	-.01	.34*	-.17*	-.10	.08	-.06	.06	.21*	.00	.14	.21*	.39*	.19*	(.40)		
18. Post-Tr. Perf.	-.09	-.01	.04	-.09	.22*	-.23*	-.14	.19*	.05	.11	.16*	.06	.11	.14	.21*	.15	.34*	(.56)	
19. Learning	.06	.02	.19	.15	.10	-.08	-.10	-.05	.09	-.01	-.03	.00	.08	.32*	.41*	.49*	.28*	.05	(.82)
20. Post-Tr. Self-Eff.	-.04	.10	.29*	-.03	.36*	-.25*	-.23*	.07	-.08	-.04	.55*	.05	.08	.28*	.14	.15*	.28*	.24*	.09
21. # Trials [c]	-.11	.02	.--	-.30*	.15	-.11	.06	-.15	.04	.19	.01	-.07	-.05	-.14	.09	.01	.12	.01	-.17
22. Accuracy [c]	.37*	.05	.--	-.08	.35*	-.31*	-.37*	.10	.16	-.06	.18	.17	.32*	.31*	.43*	.53*	.21	.10	.39*
23. Behavior [c]	.37*	-.14	.--	.14	.21	-.10	-.25*	.26*	.00	.00	.05	.20	.29*	.31*	.34*	.35*	.30*	.33*	.47*
24. Reactions	-.05	.11	.18	.00	.11	.01	-.05	-.06	.19*	-.07	.06	.17*	.24*	.56*	.22*	.23*	.16*	.05	.30*

NOTE: Reliabiliy estimates are listed in parentheses along the diagonal.
n = 163, * p < .05. [a] Coded 0 = Advanced, 1 = Remedial. [b] n = 93. [c] n = 69.

Table 4 (cont'd)

VARIABLE	20	21	22	23	24
20. Post-Tr. Self-Eff.	(.88)				
21. # Trials [c]	-.01	(.–)			
22. Accuracy [c]	.35*	.11	(.–)		
23. Behavior [c]	.18	-.29*	.38*	(.–)	
24. Reactions	.24*	-.05	.19	.16	(.80)

NOTE: Reliabiliy estimates are listed in parentheses along the diagonal.

n = 163, * $p < .05$. [c] n = 69.

Table 5

Intercorrelations Among Study Variables: Control Group

VARIABLE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Self-Esteem	(.86)														
2. Locus of Control 1 [a]	.40*	(.65)													
3. Locus of Control 2 [b]	.48*	.--	(.71)												
4. Pre-Tr. Self-Eff.	.25	.50*	.30	(.88)											
5. Mot. to Learn	-.04	.30	.48*	.42*	(.92)										
6. Pre-Tr. Knowl.	.09	.10	.34	.28*	.32*	(.71)									
7. Post-Tr. Knowl.	.10	.14	.41	.25	.40*	.75*	(.74)								
8. Pre-Tr. Perf.	.10	.04	.20	.36*	.10	.33*	.29*	(.44)							
9. Post-Tr. Perf.	.09	.13	.12	.24	.33*	.31*	.43*	.35*	(.48)						
10. Learning	.23	.04	.45	.20	.22	.53*	.58*	.23	.54*	(.68)					
11. Post-Tr. Self-Eff.	.20	.22	.60*	.59*	.48*	.34*	.29*	.41*	.40*	.36*	(.91)				
12. # Trials [b]	.15	.--	.20	.22	.04	-.26	-.28	-.46	.36	.06	.33	(.--)			
13. Accuracy [b]	.15	.--	.53*	.55*	.21	.64*	.29	.22	.28	.46	.76*	.14	(.--)		
14. Behavior [b]	-.17	.--	.09	.34	.42	.42	.35	.57*	-.05	.27	.34	-.48	.12	(.--)	
15. Reactions	.18	.19	.71*	.31*	.61*	.46*	.42*	.05	.35*	.42	.57*	.38	.57*	-.10	(.83)

NOTE: Reliabiliy estimates are listed in parentheses along the diagonal.

n = 54, * p < .05. [a] n = 37. [b] n = 17.

Pre-Training Self-Efficacy. Hypothesis 1 stated that locus of control will moderate the relationship between assignment and pre-training self-efficacy. Table 6 presents the results of the tests of this relationship for the 11-item scale. Table 7 presents the results for the 21-item scale. The results of both tests indicate a non-significant interaction term, suggesting that the hypothesized relationship was not observed. Even though this relationship was not found, tests of moderation were conducted for each of the four dimensions of attributions (luck, effort, task difficulty, and ability). It is possible that these more proximal measures may have a stronger effect on the assignment, pre-training self-efficacy relationship.

Table 8 presents the test of moderation for luck attributions. As can be seen, the results indicate a non-significant interaction between assignment and luck attributions. Table 9 presents the results for effort attributions. The results indicate the presence of a moderating relationship. The interaction was plotted using the simple-slope technique and is presented in Figure 6. As the figure shows, of the individuals who attributed their performance on the TAT to the amount of effort they expended, those assigned to advanced training showed higher levels of pre-training self-efficacy than those assigned to remedial training. In contrast, of those who did not feel that effort played a large role in their performance, those assigned to advanced training showed lower levels of pre-training self-efficacy than those assigned to remedial training.

Table 10 presents the results of the test of moderation for task difficulty attributions. The results indicate a significant interaction between assignment and task difficulty attributions. Figure 7 is a plot of the results of this interaction. The observed pattern was similar to that observed for effort attributions. Finally, Table 11 presents the results of the test of moderation for ability attributions. The results indicate a significant interaction between assignment and ability attributions. As can be seen in Figure 8, the pattern of the interaction was the same as that observed for effort and task difficulty.

Table 6

Regression Analyses Results of the Test of Moderation of Locus of Control 1 on Assignment, Pre-Training Self-Efficacy Relationship

VARIABLE	B	SE B	β	t
Assignment [a] (A)	-.02	.12	-.02	-.16
Locus of Control [b] (LOC)	.10	.10	.17	1.04
A x LOC	.02	.12	.03	.15
Constant	3.55	.09		41.38**

$R^2 = .05$

$F(3,89) = 1.15, p > .05$

** $p < .01$

[a] Coded: 0 = Advanced, 1= Remedial

[b] Standardized

Table 7

Regression Analyses Results of the Test of Moderation of Locus of Control 2 on Assignment, Pre-Training Self-Efficacy Relationship

VARIABLE	B	SE B	β	t
Assignment [a] (A)	-.29	.18	-.19	-1.57
Locus of Control [b] (LOC)	-.07	.12	-.09	-.55
A x LOC	.00	.19	.00	.02
Constant	3.57	.13		27.46**

$R^2 = .05$

$F(3,65) = 1.11, p > .05$

** $p < .01$

[a] Coded: 0 = Advanced, 1= Remedial

[b] Standardized

Table 8

Regression Analyses Results of the Test of Moderation of Luck Attributions on Assignment, Pre-Training Self-Efficacy Relationship

VARIABLE	B	SE B	β	t
Assignment [a] (A)	-.22	.10	-.17	-2.29*
Luck Attributions [b] (L)	-.31	.07	-.47	-4.78**
A x L	.12	.10	.12	1.23
Constant	3.61	.07		52.31**

$R^2 = .17$

$F(3,159) = 10.88, p < .001$

* $p < .05$, ** $p < .01$

[a] Coded: 0 = Advanced, 1= Remedial

[b] Standardized

TABLE 9

Regression Analyses Results of the Test of Moderation of Effort Attributions on Assignment, Pre-Training Self-Efficacy Relationship

VARIABLE	B	SE B	β	t
Assignment [a] (A)	-.15	.10	-.11	-1.47
Effort Attributions [b] (E)	.28	.07	.42	3.86**
A x E	-.39	.10	-.42	-3.89**
Constant	3.53	.08		42.22**

$R^2 = .11$

$F(3,159) = 6.61, p < .001$

** $p < .01$

[a] Coded: 0 = Advanced, 1= Remedial

[b] Standardized

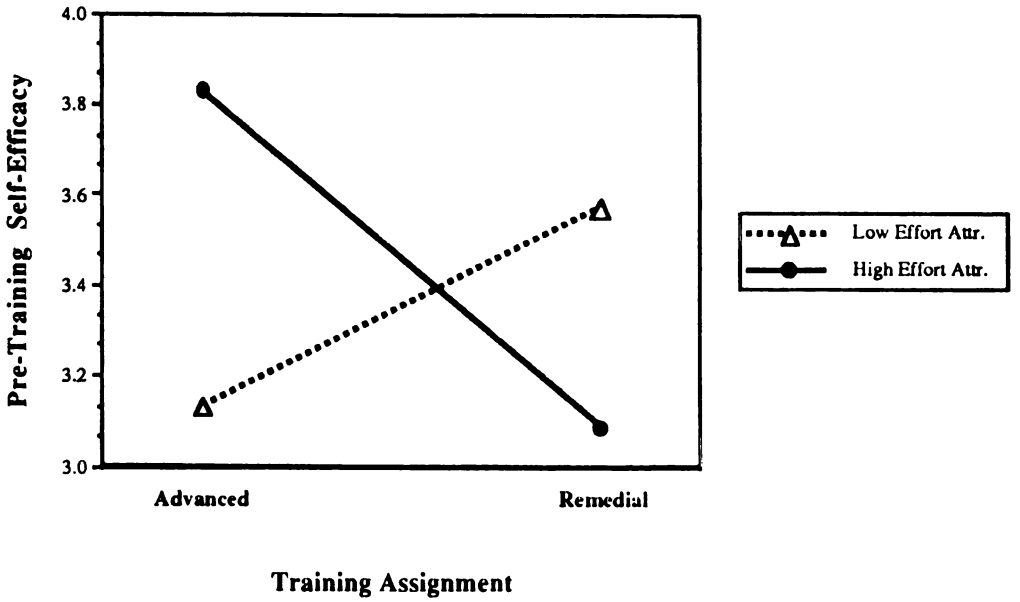

Figure 6. Relationship Between Assignment, Effort Attributions, and Pre-Training Self-Efficacy

Table 10

Regression Analyses Results of the Test of Moderation of Task Difficulty Attributions on Assignment, Pre-Training Self-Efficacy Relationship

VARIABLE	B	SE B	β	t
Assignment [a] (A)	-.15	.10	-.11	-1.49
Task Difficulty [b] (TD)	.14	.08	.22	1.80
A x TD	-.30	.10	-.35	-2.89**
Constant	3.58	.07		49.02**

$R^2 = .06$

$F(3,159) = 3.68, p < .05$

** $p < .01$

[a] Coded: 0 = Advanced, 1= Remedial

[b] Standardized

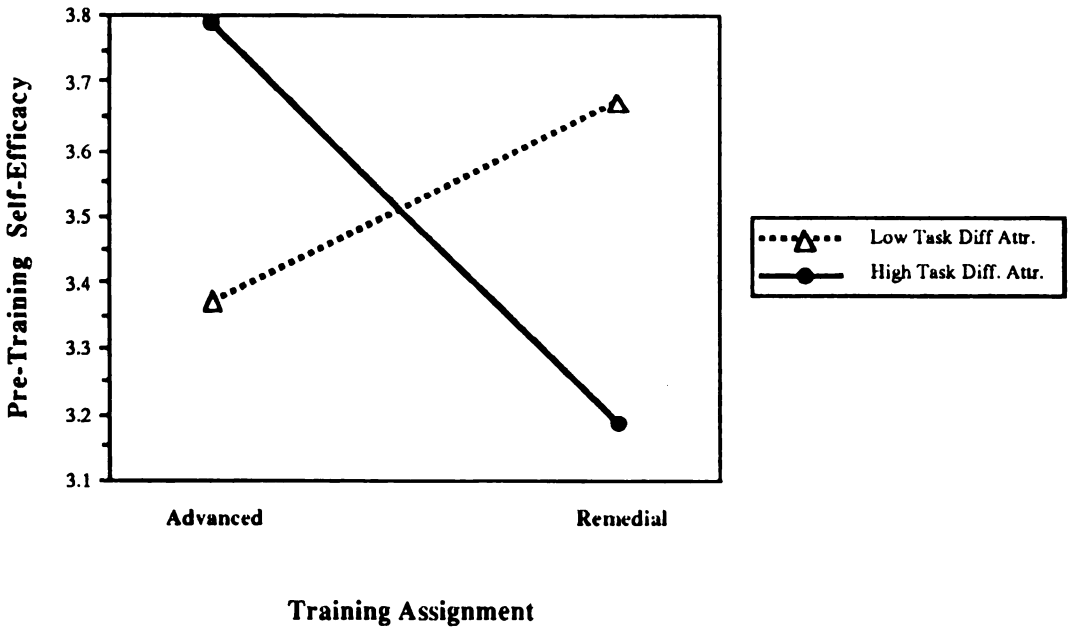

Figure 7. Relationship Between Assignment, Task Difficulty Attributions, and Pre-Training Self-Efficacy

Table 11

Regression Analyses Results of the Test of Moderation of Ability Attributions on Assignment, Pre-Training Self-Efficacy Relationship

VARIABLE	B	SE B	β	t
Assignment [a] (A)	-.16	.10	-.12	-1.57
Ability Attributions [b] (B)	.15	.07	.23	2.08*
A x B	-.35	.10	-.36	-3.35**
Constant	3.52	.07		47.31**

$R^2 = .08$

$F(3,159) = 4.54, p < .01$

* $p < .05$, ** $p < .01$

[a] Coded: 0 = Advanced, 1= Remedial

[b] Standardized

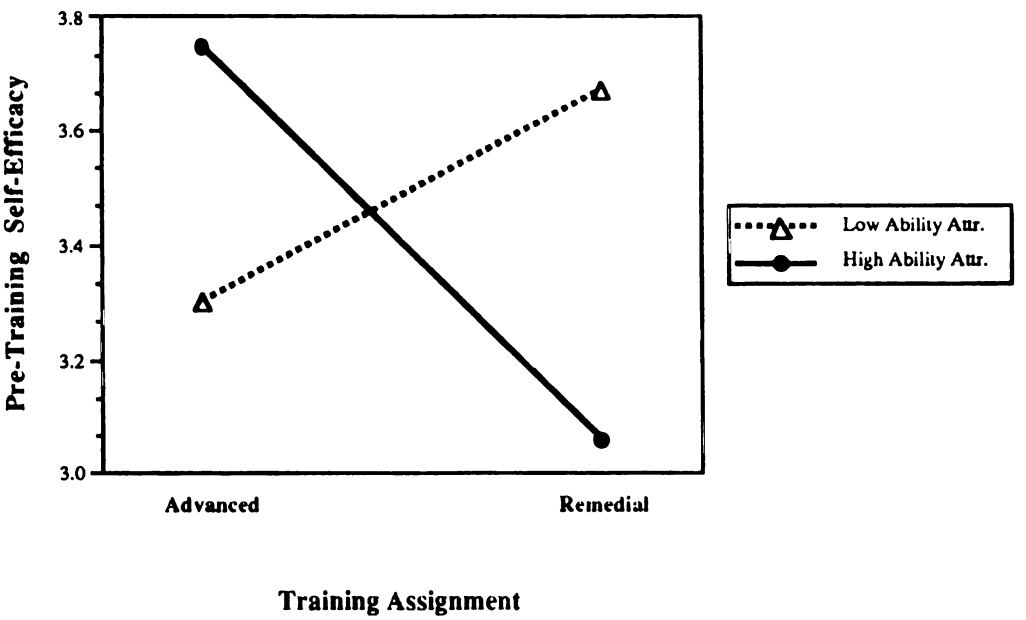

Figure 8. Relationship Between Assignment, Ability Attributions, and Pre-Training Self-Efficacy.

In summary, the hypothesized interaction between training assignment and locus of control was not observed. However, when the interaction between assignment and attributions were examined, a pattern similar to that hypothesized for locus of control was observed. Assigning individuals to remedial training as opposed to advanced training, resulted in lower pre-training self-efficacy when performance on the TAT was attributed to effort, task difficulty, and inborn ability. However, when these attributions were low, assigning individuals to remedial training resulted in higher levels of pre-training self-efficacy than those assigned to advanced training.

Hypothesis 2 predicted that self-esteem will moderate the relationship between assignment and pre-training self-efficacy. Table 12 presents the results of the test of moderation. As can be seen from the table, the hypothesized interaction was not observed. Self-esteem was positively related to pre-training self-efficacy, however, this relationship did not differ across assignment conditions.

Fairness Perceptions. Hypothesis 3 stated that perceived performance will moderate the relationship between training assignment and fairness perceptions. Both distributive and procedural justice dimensions of perceived fairness were measured. The zero-order correlation between these two dimensions was $r = .50$, $p < .01$. This correlation was not sufficiently large to justify combining the two measures into a single measure of fairness. Therefore, moderator analyses were conducted for each of the two dimensions separately.

Table 13 presents the results of the test of moderation using distributive justice as the dependent variable. The results show a significant interaction between training assignment and perceived performance. Simple slope analyses are plotted in Figure 9. Individuals who perceived their performance on the TAT to be high, and were assigned to remedial training, reported lower levels of distributive justice than those assigned to advanced training. Conversely, those who perceived their performance on the TAT to be

low, and were assigned to remedial training, reported higher levels of distributive justice than those assigned to advanced training.

Table 14 presents the results of the test of moderation using procedural justice as the dependent variable. The results also indicate a significant interaction between perceived performance and training assignment. As Figure 10 shows, the interaction was in the same direction as that observed for distributive justice.

Hypothesis 4 predicted that expected assignment would moderate the relationship between actual training assignment and perceived fairness. As with hypothesis 3, this test was conducted for distributive and procedural justice separately. Table 15 presents the results of the test of moderation with distributive justice as the dependent variable. The results indicate a significant interaction between expected assignment and actual training assignment. As Figure 11 shows, those expecting to be assigned to advanced training, and who were assigned to remedial training, reported lower levels of distributive justice than those assigned to advanced training. Conversely, those expecting remedial training and who were assigned to remedial training reported higher levels of distributive justice than those assigned to advanced training.

Table 16 presents the results of the test of moderation of expected assignment using procedural justice as the dependent variable. The results revealed a significant interaction between expected assignment and actual training assignment. Figure 12 presents the graphic interpretation of this interaction. The figure shows a similar relationship as that observed for distributive justice.

Table 12

Regression Analyses Results of the Test of Moderation of Self-Esteem on Assignment, Pre-Training Self-Efficacy Relationship

VARIABLE	B	SE B	β	t
Assignment [a] (A)	-.13	.10	-.10	-1.24
Self-Esteem [b] (SE)	.20	.07	.31	2.94**
A x SE	-.16	.10	-.17	-1.59
Constant	3.55	.07		49.09**

$R^2 = .06$

$F(3,158) = 2.10, p < .05$

** $p < .01$

[a] Coded: 0 = Advanced, 1= Remedial

[b] Standardized

Table 13

Regression Analyses Results of the Test of Moderation of Perceived Performance on Assignment, Distributive Justice Relationship

VARIABLE	B	SE B	β	t
Assignment [a] (A)	.34	.09	.25	3.90**
Perceived Performance [b] (P)	.39	.06	.56	6.20**
A x P	-.76	.09	-.80	-8.78**
Constant	3.34	.06		54.17**

$R^2 = .37$

$F(3,159) = 30.76, p < .001$

** $p < .01$

[a] Coded: 0 = Advanced, 1= Remedial

[b] Standardized

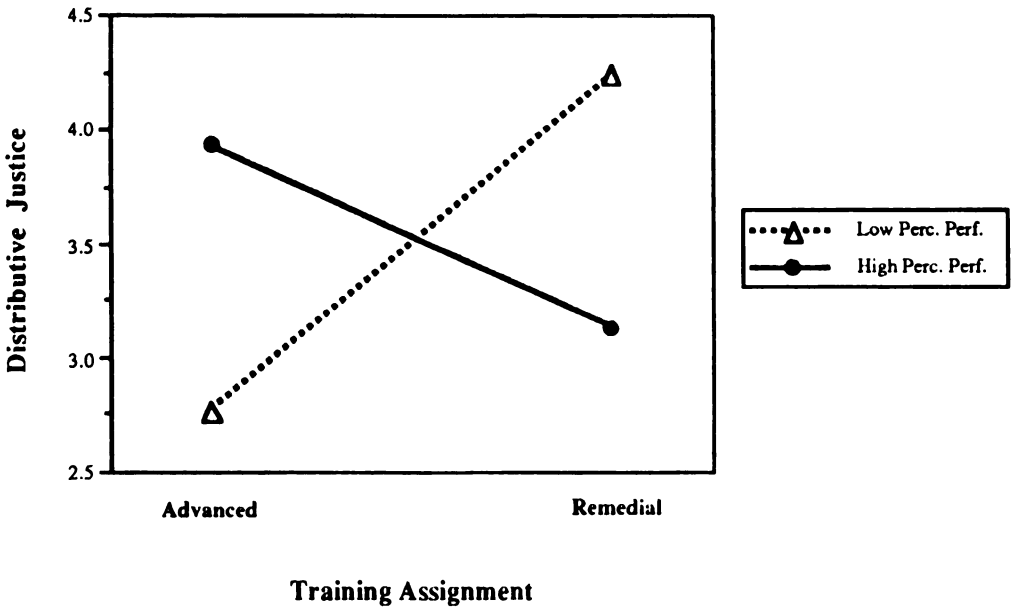

Figure 9. Relationship Between Assignment, Perceived Performance, and Distributive Justice.

Table 14

Regression Analyses Results of the Test of Moderation of Perceived Performance on Assignment, Procedural Justice Relationship

VARIABLE	B	SE B	β	t
Assignment [a] (A)	.00	.08	.00	.01
Perceived Performance [b] (P)	.19	.06	.38	3.50**
A x P	-.27	.08	-.38	-3.50**
Constant	3.26	.05		59.65**

$R^2 = .08$

$F(3,159) = 4.75, p < .01$

** $p < .01$

[a] Coded: 0 = Advanced, 1= Remedial

[b] Standardized

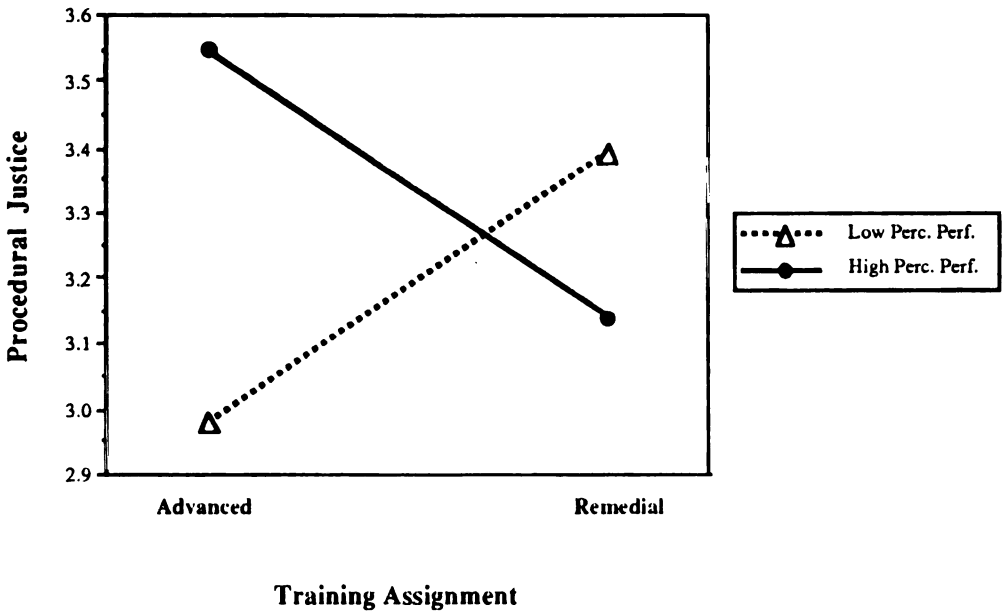

Figure 10. Relationship Between Assignment, Perceived Performance, and Procedural Justice.

Table 15

Regression Analyses Results of the Test of Moderation of Expected Assignment on Assignment, Distributive Justice Relationship

VARIABLE	B	SE B	β	t
Assignment [a] (A)	-.71	.18	-.52	-3.92**
Expected Assignment [a] (E)	-.60	.15	-.39	-4.08**
A x E	1.41	.21	1.00	6.73**
Constant	3.78	.13		29.98**

$R^2 = .26$

$F(3,159) = 19.81, p < .001$

** $p < .01$

[a] Coded: 0 = Advanced, 1= Remedial

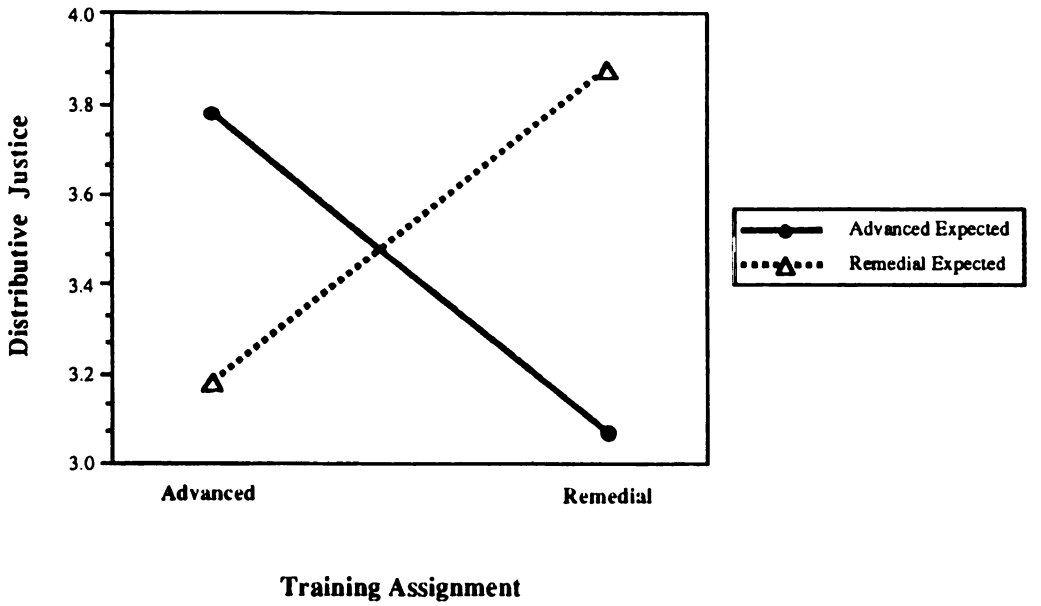

Figure 11. Relationship Between Assignment, Expected Assignment, and Distributive Justice.

Table 16

Regression Analyses Results of the Test of Moderation of Expected Assignment on Assignment, Procedural Justice Relationship

VARIABLE	B	SE B	β	t
Assignment [a] (A)	-.42	.15	-.41	-2.77**
Expected Assignment [a] (E)	-.30	.12	-.26	-2.43*
A x E	.57	.18	.55	3.23**
Constant	3.47	.11		33.03**

$R^2 = .06$

$F(3,159) = 3.49, p < .05$

* $p < .05$, ** $p < .01$

[a] Coded: 0 = Advanced, 1= Remedial

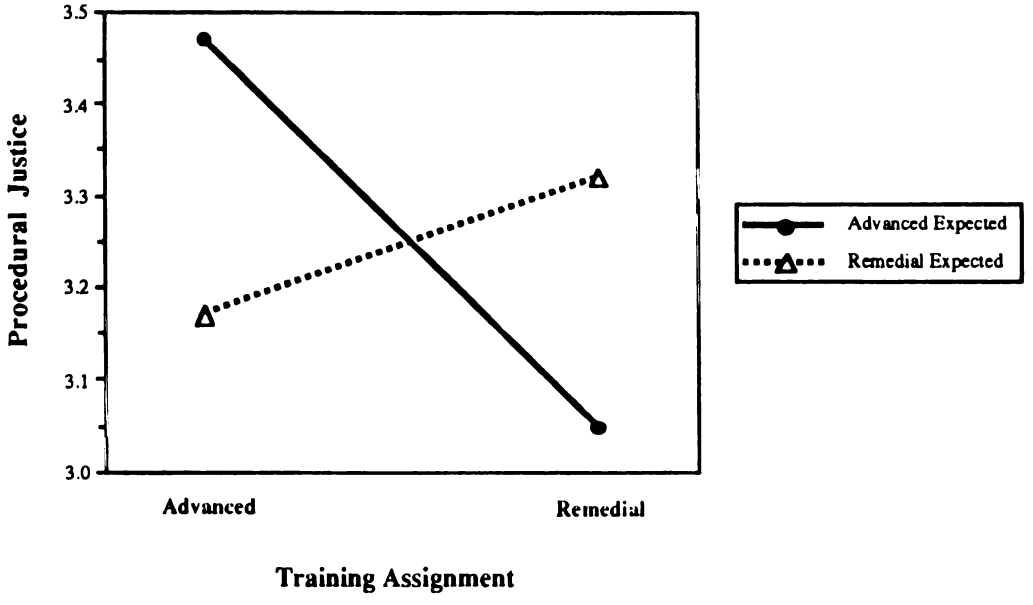

Figure 12. Relationship Between Assignment, Expected Assignment, and Procedural Justice.

In summary, the results supported the hypotheses by showing that the participants' beliefs regarding their past performance and their expectations about future assignments served to moderate the relationship between training assignments and fairness perceptions. When these beliefs and expectations were consistent with actual assignments, individuals reported higher levels of distributive and procedural fairness than when they were counter to actual assignments.

Summary. The moderator analyses, taken as a whole, provide evidence supporting the hypothesized relationships between training assignments and pre-training characteristics. Specifically, the results show that individuals who attributed their performance on the TAT to effort, task difficulty, and ability, reported higher levels of pre-training self-efficacy when assigned to advanced training as opposed to remedial training. For those not attributing past performance to these factors, the opposite effect was found. For this latter group, assignment to remedial training resulted in higher levels of pre-training self-efficacy than assignment to advanced training

In addition, evidence was found for the hypothesized effects of training assignment on fairness perceptions. Both, perceptions of past performance, as well as expectations regarding training assignments, were found to moderate the relationship between training assignments and fairness perceptions. When perceptions and expectations were consistent with actual assignment (e.g.,. expected remedial, received remedial), individuals reported more positive levels of distributive and procedural justice than when these factors were inconsistent with actual assignments.

Structural Hypotheses

The next set of hypotheses deal with the effects of the differences in pre-training self-efficacy and fairness perceptions discussed in the previous section. These differences were hypothesized to affect motivation to learn and affective outcomes directly, as well as

performance outcomes, indirectly. Pre-training self-efficacy was hypothesized to affect training outcomes through its influence on motivation to learn. The tests of these hypotheses are discussed below.

Motivation to Learn. Hypothesis 5 predicted that pre-training self-efficacy will be positively related to motivation to learn. Similar relationships were predicted between distributive justice, procedural justice, and motivation to learn by Hypotheses 6 and 7, respectively. The goal of this set of analyses was to determine the independent effects of these variables on motivation to learn. Therefore, motivation to learn was regressed on pre-training self-efficacy, distributive justice, and procedural justice, simultaneously. The results of this test can be found in Table 17. The results show that pre-training self-efficacy was positively related to motivation to learn ($\beta = .29$, $p < .01$), giving support to Hypothesis 5. The results also show non-significant effects for distributive and procedural justice, suggesting a lack of support for Hypotheses 6 and 7. All variables accounted for 13% of the variance in motivation to learn.

Performance Outcomes. Hypothesis 8 predicted that motivation to learn will be positively related to actual learning. The model also suggests that the effects of motivation to learn are above and beyond those of pre-training self-efficacy, distributive, and procedural justice. Therefore, Hypothesis 8 was tested in conjunction with a test of mediation (James & Brett, 1984). Two measures of learning were used to test this hypothesis.

First, pre-training knowledge scores were covaried out of post-training knowledge scores prior to conducting the test of mediation (Arvey & Cole, 1989). The results of this test can be found in Table 18. The results show that motivation to learn was positively related to post-training knowledge ($\beta = .18$, $p < .01$). In addition, the results show that motivation to learn added a significant increase in explained variance above pre-training self-efficacy, distributive, and procedural justice ($\Delta R^2 = .03$, $p < .01$). Finally, pre-

training self-efficacy, distributive, and procedural justice did not add prediction above the effects of motivation to learn. All variables accounted for 43% of the variance of post-training knowledge scores. These results give support to Hypothesis 8 as well as the mediated relationship suggested by the conceptual model.

The second measure of learning used was the 13-item Learning measure. Table 19 presents the results of the test of Hypothesis with this learning measure.The results show that motivation to learn was positively related to learning ($\beta = .35$, $p < .01$). In addition, the results show that motivation to learn added a significant increase in explained variance above pre-training self-efficacy, distributive, and procedural justice ($\Delta R^2 = .11$, $p < .01$). Finally, pre-training self-efficacy, distributive, and procedural justice did not add prediction above the effects of motivation to learn. All variables accounted for 12% of the variance in learning scores. These results also give support to Hypothesis 8 as well as the mediated relationship suggested by the conceptual model.

Hypothesis 9 predicted that motivation to learn will be positively related to behavioral outcomes of training. The "Behavior" measure described in the Measures section served as the dependent variable for these analyses. As with Hypothesis 8, this hypothesis was also tested in conjunction with a test of mediation. Table 20 presents the test of this hypothesis. The results show that motivation to learn was positively related to behavioral outcomes of training ($\beta = .28$, $p < .05$). Individuals reporting higher levels of motivation to learn were more likely to measure more interactions while performing the Air Defense Task than those reporting low levels of motivation to learn. However, the test of mediation was not supported. Differences in degrees of freedom, rather than a true relationship, appeared to account for the significance of motivation to learn over pre-training charactersistics All variables accounted for 15% of the variance in behavior scores.

Table 17

Regression Results of the Effects of Distributive Justice, Procedural Justice, and Pre-Training Self-Efficacy, on Motivation to Learn

VARIABLE	B	SE B	β	t
Distributive Justice	.14	.08	.15	1.71
Procedural Justice	.16	.11	.12	1.44
Pre-Training Self-Efficacy	.28	.07	.29	3.86**
Constant	1.86	.41		4.53**

$R^2 = .13$

$F(3,159) = 8.06, p < .001$

** $p < .01$

Table 18

Hierarchical Regression Results of Test of Mediation of Motivation to Learn on Post-Training Knowledge

VARIABLE	β [a]	ΔR^2	R^2
EQUATION 1			
STEP 1:			
Pre-Training Knowledge	.58**	.39**	.39**
STEP 2:			
Pre-Training Self-Efficacy	-.09	.01	.40**
Distributive Justice	-.11		
Procedural Justice	.05		
STEP 3:			
Motivation to Learn	.18**	.03**	.43**
EQUATION 2			
STEP 1:			
Pre-Training Knowledge	.58**	.39**	.39**
STEP 2:			
Motivation to Learn	.18**	.02*	.41**
STEP 3:			
Pre-Training Self-Efficacy	-.09	.01	.43**
Distributive Justice	-.11		
Procedural Justice	.05		

n = 162

* $p < .05$, ** $p < .01$

[a] These are standardized regression weights from the final equation, after all variables have been entered.

Table 19

Hierarchical Regression Results of the Test of Mediation of Motivation to Learn on Learning

VARIABLE	β	ΔR^2	R^2
EQUATION 1			
STEP 1:			
Pre-Training Self-Efficacy	-.15	.01	.01
Distributive Justice	-.11		
Procedural Justice	.06		
STEP 2:			
Motivation to Learn	.35**	.11**	.12**
EQUATION 2			
STEP 1:			
Motivation to Learn	.35**	.09**	.09**
STEP 2:			
Pre-Training Self-Efficacy	-.15	.03	.12**
Distributive Justice	-.11		
Procedural Justice	.06		

n = 162

* $p < .05$, ** $p < .01$

Table 20

Hierarchical Regression Results of the Test of Mediation of Motivation to Learn on Behavior

VARIABLE	β	ΔR^2	R^2
EQUATION 1			
STEP 1:			
Pre-Training Self-Efficacy	-.07	.09	.09
Distributive Justice	-.02		
Procedural Justice	.24		
STEP 2:			
Motivation to Learn	.28*	.06*	.15*
EQUATION 2			
STEP 1:			
Motivation to Learn	.28*	.09*	.09*
STEP 2:			
Pre-Training Self-Efficacy	-.07	.06	.15*
Distributive Justice	-.02		
Procedural Justice	.24		

n = 68

* $p < .05$

Hypothesis 10 predicted that motivation to learn will be positively related to post-training task performance. The mediating effects of motivation to learn were also tested in conjunction with this hypothesis. Three measures of performance were used as dependent variables in these analyses. First, pre-training performance scores were covaried out of post-training performance scores in order to assess changes in performance scores as a result of training. Table 21 presents the results of these analyses. The results failed to support Hypothesis 10. Motivation to learn was not related to changes in performance scores.

Secondly, accuracy scores were used as the dependent variable in the test of Hypothesis 10. These scores represent an individual's average number of points (-2 to +2) received across different trials of the Air Defense Task. Table 22 presents the results of this test. The results show a marginal positive relationship between motivation to learn and accuracy ($\beta = .24$, $p < .10$). In addition, the mediation hypothesis was not supported. The results do show a direct, positive relationship between procedural justice and accuracy ($\beta = .30$, $p < .05$). The amount of variance in accuracy predicted was only marginally significant. Thus, the results failed to provide support for Hypothesis 10.

Thirdly, the number of trials completed in the 40 minute interval was used as the dependent variable in the test of Hypothesis 10. The results are reported in Table 23. The results failed to support Hypothesis 10. There was no relationship between motivation to learn and the number of trials completed. The variables as a whole, failed to account for any significant amount of variance in number of trails.

Table 21

Hierarchical Regression Results of the Test of Mediation of Motivation to Learn on Post-Training Performance

VARIABLE	β	ΔR^2	R^2
EQUATION 1			
STEP 1:			
Pre-Training Performance	.31**	.12**	.12**
STEP 2:			
Pre-Training Self-Efficacy	.09	.01	.13**
Distributive Justice	.04		
Procedural Justice	.04		
STEP 3:			
Motivation to Learn	.11	.00	.13**
EQUATION 2			
STEP 1:			
Pre-Training Performance	.31**	.12**	.12**
STEP 2:			
Motivation to Learn	.03	.00	.12**
STEP 3:			
Pre-Training Self-Efficacy	.09	.01	.13**
Distributive Justice	.04		
Procedural Justice	.04		

n = 162

* $p < .05$, ** $p < .01$

Table 22

Hierarchical regression Results of the Test of Mediation of Motivation to Learn on Accuracy

VARIABLE	β	ΔR^2	R^2
EQUATION 1			
STEP 1:			
Pre-Training Self-Efficacy	.07	.13**	.13**
Distributive Justice	-.08		
Procedural Justice	.30**		
STEP 2:			
Motivation to Learn	.24*	.04*	.17**
EQUATION 2			
STEP 1:			
Motivation to Learn	.24*	.10**	.10**
STEP 2:			
Pre-Training Self-Efficacy	.07	.07	.17**
Distributive Justice	-.08		
Procedural Justice	.30**		

n = 68

* $p < .10$, ** $p < .05$

Table 23

Hierarchical Regression Results of the Test of Mediation of Motivation to Learn on Number of Trials

VARIABLE	β	ΔR^2	R^2
EQUATION 1			
STEP 1:			
Pre-Training Self-Efficacy	.07	.00	.00
Distributive Justice	-.03		
Procedural Justice	.00		
STEP 2:			
Motivation to Learn	-.16	.02	.02
EQUATION 2			
STEP 1:			
Motivation to Learn	-.16	.02	.02
STEP 2:			
Pre-Training Self-Efficacy	.07	.00	.02
Distributive Justice	-.03		
Procedural Justice	.00		

n = 68

In summary, the results indicate that pre-training motivation was related to a number of performance outcomes. First, those reporting high levels of motivation to learn actually learned more of the training content. Secondly, those who reported higher levels of motivation to learn actually applied more of the training content (measured more interactions) than those reporting low levels of motivation to learn. Thirdly, the hypotheses regarding performance (post-training performance and accuracy) were not supported. Only marginal effects were found for the effects of motivation to learn on these two measures of performance. Finally, the hypothesized role of motivation to learn as a mediator of the effects of pre-training self-efficacy and fairness perceptions on learning and behavior was also supported.

Affective Outcomes. The final set of hypotheses dealt with the relationship between fairness perceptions, performance outcomes, and affective outcomes of training. First, Hypotheses 11 through 14 predicted that fairness perceptions and performance outcomes will be positively related to training reactions. The correlations in Table 2 suggest support for Hypotheses 11 & 12. Higher fairness perceptions were related to more positive training reactions ($r = .17$ and $r = .24$, $p < .05$ for procedural and distributive fairness respectively). In order to determine if the performance outcomes had an independent effect on training reactions, all performance outcomes were included in the same regression equation. Table 24 presents the results of this test. As the results indicate, there were not independent effects between fairness perceptions, performance outcomes, and reactions.

Table 24

Regression Results of the Effects of Fairness Perceptions and Performance Outcomes on Training Reactions

VARIABLE	B	SE B	β	t
FAIRNESS PERCEPTIONS				
Distributive Justice	.05	.11	.07	.44
Procedural Justice	.06	.18	.06	.33
PERFORMANCE OUTCOMES				
Learning	.02	.03	.12	.67
Post-Training Knowledge	.00	.03	.01	.07
Post-Training Performance	.00	.03	-.01	-.05
Number of Trials	.00	.01	-.03	-.23
Behavior	.01	.09	.02	.10
Accuracy	.20	.32	.10	.63
Constant	2.87	.66		4.33**

$R^2 = .06$

$F(8,59) = .50, p > .05$

n = 68

** $p < .001$

Hypotheses 15 through 18 predicted a positive relationship between fairness perceptions, performance outcomes, and post-training self-efficacy. Table 25 presents the results of the test of these hypotheses. The results indicate that, after partialing out pre-training self-efficacy scores, accuracy was positively related to post-training self-efficacy ($\beta = .31$, $p < .05$); thus supporting Hypothesis 18. However, none of the other hypotheses were supported. All variables accounted for 51% of the variance in post-training self-efficacy.

Summary. Taken as a whole, the results of the tests of the Structural Hypotheses give partial support for the hypothesized role of pre-training characteristics on training outcomes. Specifically, the results indicate a positive relationship between pre-training self-efficacy and motivation to learn. Motivation to learn was then shown to be positively related to learning and behavioral outcomes of training. Furthermore, accuracy was shown to be positively related to post-training self-efficacy, after accounting for differences in pre-training self-efficacy.

Fairness perceptions were also found to be positively related to training reactions. Those who perceived their training assignments to be fair reported more positive attitudes toward the training program as a whole. In general pre-training self-efficacy and motivation to learn were shown to be the most important variables relating training assignments to training outcomes.

The tests described above provide a test of the process by which the framing of training assignments affect training outcomes. However, another set of analyses were conducted in order to determine the effects of framing as compared to a control group receiving no framing. In this way, the general effects of framing as a whole on key process and outcome variables can be determined. These analyses are described below.

Table 25

Regression Results of the Effects of Fairness Perceptions and Performance Outcomes on Post-Training Self-Efficacy

VARIABLE	B	SE B	β	t
Pre-Training Self-Efficacy	.46	.08	.58	6.06**
FAIRNESS PERCEPTIONS				
Distributive Justice	.14	.09	.17	1.49
Procedural Justice	-.07	.15	-.06	-.44
PERFORMANCE OUTCOMES				
Learning	.02	.03	.11	.89
Post-Training Knowledge	-.05	.03	-.24	-1.73
Post-Training Performance	.03	.03	.11	1.06
Number of Trials	.00	.01	.01	.10
Behavior	.01	.07	.02	.19
Accuracy	.69	.27	.31	2.50*
Constant	1.05		.60	1.74

$R^2 = .51$

$F(9,58) = 6.59, p < .001$

n = 68

* $p < .05$, ** $p < .01$

Control Group Comparisons

The dummy coding strategy described in the Analytic Strategy section was used to examine the overall effects of framing compared against the control group. Each dependent variable of interest was regressed on the dummy coded variables in separate analyses. However, these analyses were grouped in three main categories for ease of presentation.

Pre-Training Characteristics. First, the effects of framing on pre-training self-efficacy and motivation to learn, were examined. Fairness perceptions were not collected from the control group given the fact that these were irrelevant variables. Table 26 presents a summary of the results if these tests. The results show that both experimental groups had significantly lower levels of motivation to learn than the control group ($\beta = -.26$, $p < .01$ for the advanced group, and $\beta = -.19$, $p < .05$ for the remedial group). Framing effects accounted for 4% of the variance in motivation to learn scores. Framing was not related to pre-training self-efficacy.

Performance Outcomes. Secondly, the effects of framing on performance outcomes were examined. Table 27 presents the results of these tests. The results indicate that the experimental groups did not differ significantly from the control group. However, the two experimental groups differed from each other in terms of accuracy. Individuals assigned to remedial training were significanty more accurate in performing the Air Defense Task than those assigned to advanced training ($r= .37$, $p < .05$). This result suggests a more direct effect of framing on training outcomes than that investigated in this study.

Affective Outcomes. Finally, the effects of framing on affective outcomes were examined. The results are presented in Table 28. The results indicate that both experimental groups had significantly lower levels of post-training self-efficacy and more negative training reactions than the control group. These results suggest that, while affecting performance outcomes indirectly through self-efficacy and motivation to learn, framing has a direct impact on affective outcomes of training. The results also suggest that

framing, regardless of whether it is positive or negative, results in lower levels of affective outcomes.

Table 26

Regression Results of Control Group Comparisons: Pre-Training Characteristics

Pre-Training Characteristics	Advanced [a]	Remedial [a]	R^2
Pre-Training Self-Efficacy	-.09	-.20*	.03
Motivation to Learn	-.26**	-.19*	.04*

n = 213

* p < .05, ** p < .01

[a] These numbers represent beta-weights of dummy coded variables comparing the experimental groups to the control group.

Table 27

Regression Results of Control Group Comparisons: Performance Outcomes

Performance Outcome	Advanced [a]	Remedial [a]	R^2
Learning [b]	.00	.09	.01
Post-Training Knowledge [b,d]	-.02	-.03	.00
Post-Training Performance [b,d]	.10	.00	.01
Number of Trials [c]	.19	.09	.02
Accuracy [c]	-.20	.18	.12**
Behavior [c]	-.15	.23	.12**

** $p < .01$

[a] These numbers represent beta-weights of dummy coded variables comparing the experimental groups to the control group. [b] n = 213. [c] n = 85. [d] After covarying pre-training knowledge and performance.

Table 28

Regression Results of Control Group Comparisons: Affective Outcomes

Affective Outcome	**Advanced** [a]	**Remedial** [a]	**R** ^{2}
Post-Training Self-Efficacy [b]	-.18*	-.16*	.02*
Reactions	-.18*	-.23**	.03*

n = 213

* p < .05, ** p < .01

[a] These numbers represent beta-weights of dummy coded variables comparing the experimental groups to the control group. [b] After covarying out the effects of pre-training self-efficacy.

DISCUSSION

The purpose of the present study was to expand research on training effectiveness by examining the extent to which pre-training context factors affect training outcomes. In particular, the present study examined the framing of training assignments (assigned, remedial) on training outcomes. A conceptual model was developed which suggests that framing affects training outcomes through pre-training characteristics, namely, fairness perceptions and pre-training self-efficacy. These were hypothesized to affect training outcomes through motivation to learn. Finally, a number of individual characteristics were hypothesized to moderate the relationship between training assignments and pre-training characteristics.

The discussion of this study is organized in the following manner. First, a summary of the study results is presented. Second, implications of the study results along with a discussion of future research are presented. Finally, limitations of the study are presented.

Summary of Results

Moderating Hypotheses. The first set of hypotheses examined suggested that a number of individual characteristics would moderate the relationship between training assignment and pre-training characteristics. Hypothesis 1 predicted that locus of control would moderate the relationship between assignment and pre-training self-efficacy. Two tests of this hypothesis were conducted, one for each measure of locus of control. Neither test found support for Hypothesis 1. However, when the actual attributions which

individuals made regarding their training assignment were used in the analyses, a pattern similar to that hypothesized was observed. For individuals who attributed their past performance to effort, task difficulty, and ability, assignment to advanced training resulted in higher levels of pre-training self-efficacy than assignment to remedial training. However, for those not making these attributions, the opposite pattern was observed. Assignment to remedial training resulted in higher levels of pre-training self-efficacy than assignment to advanced training.

There are a number of possible reasons for the failure to find the hypothesized effects of locus of control. First, the somewhat low scale reliabilities as well as the smaller sample sizes associated with these measures may have decreased statistical power, thus making it more difficult to find a significant interaction. Secondly, the hypothesized mechanism by which locus of control will moderate this relationship was not observed. It was hypothesized that locus of control will be consistently related to an individual's propensity to make internal vs external attributions. However, the correlations between locus of control and attributions did not support this mechanism (see Table 4). Therefore it is not surprising that when the actual attributions were used, the hypothesized relationships were observed. This brings into question the construct validity of the locus of control measures.

However, the results using the attribution measures give support to the main thesis presented in this study. Framing of training assignments can communicate feedback regarding past performance and affect an individual's level of efficacy going into training. However, consistent with attribution theory (Weiner, 1985) and social learning theory (eg. Bandura, 1977), this feedback did not have a direct relationship with efficacy expectations. Those who attributed their past performance to seemingly internal (effort) or uncontrollable (task difficulty, ability) causes, were most affected by the framing of training assignments. The implications of this and other findings are discussed in more detail later.

Hypothesis 2 predicted that self-esteem would moderate the relationship between assignment and pre-training self-efficacy. Those high in self-esteem were expected to maintain a high level of efficacy, regardless of training assignment. Those low in self-esteem, on the other hand, were expected to have higher levels of self-efficacy when assigned to advanced training than when assigned to remedial training. The hypothesized interaction was not observed. Instead, a direct relationship between self-esteem and pre-training self-efficacy was observed. Those high in self-esteem reported higher levels of self-efficacy than those low in self-esteem, regardless of training assignment.

It is possible that the nature of the training assignment manipulation did not serve to enhance the efficacy of low self-esteem individuals assigned to advanced training, as expected. Given the novelty of the task, perhaps assignment to advanced training was not a sufficiently relevant piece of positive feedback to overcome a low self-image. In addition, most of the participants reported a relatively high level of self-esteem (mean = 4.11, SD = .53 on a 5-point scale). The sample may not have contained enough truly low self-esteem individuals to find the effect hypothesized.

Hypothesis 3 predicted that an individual's perceived performance on the TAT would moderate the relationship between training assignment and fairness perceptions. Of those perceiving high levels of past performance, assignment to advanced training would result in higher fairness perceptions than assignment to remedial training. The results supported the hypothesized relationship for both distributive, and procedural justice measures of fairness. Similar results were hypothesized, and found, for expected assignment (Hypothesis 4).

It is not surprising that similar results were found for perceived performance and expected assignment. Those who thought they performed well were more likely to be the ones expecting to be assigned to advanced training. In fact, the observed correlation between perceived performance and expected assignment was $r = -.60$, $p < .01$. Taken as

a whole, the results support the hypothesis that framing can confirm or disconfirm an individual's expectations regarding their training needs. This confirmation process results in differences in fairness perceptions regarding training assignments.

Structural Hypotheses. The next set of hypotheses dealt with the process by which pre-training characteristics resulting from training assignments lead to differences in training outcomes. Hypotheses 5 through 7 predicted that differences in fairness perceptions and pre-training self-efficacy would be positively related to differences in motivation to learn. Only self-efficacy was shown to be positively related to motivation to learn, supporting Hypothesis 5. Distributive and procedural justice were not found to be related to motivation to learn. However, this lack of support of Hypotheses 6 & 7 may have been a result of statistical artifacts.

As table 4 demonstrates, distributive and procedural justice both, had positive correlations with motivation to learn ($r = .19$ and $r = .20$, both $p < .05$, respectively). In addition, they were not highly correlated with self-efficacy. However, they were sufficiently correlated with each other to create a multicollinearity problem (Cohen & Cohen, 1983; Kennedy, 1992). This high intercorrelation has the effect of increasing the standard errors of the regression coefficients. One remedy to this problem might be to combine the distributive and procedural justice measures into one measure of fairness perceptions. When this is done, fairness ($\alpha = .91$) is shown to have a positive effect on motivation to learn ($\beta = .23$, $p < .01$).

However, even though the high observed reliability of the combined fairness measure suggests the presence of one construct, factor analyses reveal two distinct factors. Cortina (1993) suggested that it is possible to find high internal consistency estimates of reliability for a set of multi-factorial items, especially when a large number of items are used. Therefore, it appears that while being distinct, yet correlated, constructs, the variance shared by distributive and procedural justice ($r^2 = .25$) is the same variance that

they share with motivation to learn. The best estimate of this shared relationship with motivation to learn is the regression weight reported earlier using the combined fairness scale ($\beta = .23$, $p < .01$).

These ancillary analyses provide support for Hypotheses 6 and 7. An individual's perceptions of fairness regarding their training assignment are positively related to their motivation to learn during the training program. These findings give further support to the general thesis presented in this study regarding the potentially negative effects of the framing of training assignments. Low levels of self-efficacy and fairness perceptions are likely to lead to low level of motivation to learn. The next set of hypotheses examined the effects of motivation to learn on training outcomes.

Hypotheses 8, 9, and 10 predicted that motivation to learn would be positively related to performance outcomes. Hypotheses 8, predicting a positive relationship between motivation to learn and learning, was supported using two different measures of learning. The first test represented a stronger test of this hypothesis because it covaried out differences in pre-training knowledge (Arvey & Cole, 1989; Goldstein, 1993). The second test employed a post-training measure only. However, both tests supported the hypothesis by showing that motivation to learn was positively related to actual learning. This relationship was observed even after controlling for differences in pre-training self-efficacy and fairness perceptions. These findings also support the general framework of the model which hypothesizes that motivation to learn actually mediates the relationship between pre-training self-efficacy, fairness perceptions, and training outcomes.

Hypothesis 9 predicted that motivation to learn will be positively related to behavior. This hypothesis was also supported. Individuals reporting higher levels of motivation to learn actually applied more of the training content while performing the Air Defense Task than those reporting lower levels of motivation to learn. In particular, they

were more likely to measure more interactions before making a judgment, as was discussed in the training course.

Hypothesis 10 predicted that motivation to learn would be positively related to post-training performance. Three measures of performance were used to test this hypothesis. These included post-training performance, accuracy, and number of trials completed. The results indicate only a marginal effect for motivation to learn on accuracy. The results also revealed a direct effect for procedural justice on accuracy. Those reporting higher levels of procedural justice were more accurate in performing the Air Defense Task. The low reliabilities of both pre- and post-training performance may have been responsible for the non-significant results of that particular test of Hypothesis 10. Furthermore, the number of trials measure may have not been a sensitive enough measure of training effects. Individuals were not explicitly taught how to complete trials as quickly as possible. In fact, if the training was applied, individuals may actually take longer to complete a trial. Since the focus on training was on quality, it is perhaps not surprising that number of trials, a quantitative measure of performance, was not affected by differences in motivation to learn.

In general, the results show that motivation to learn was positively related to learning and behavioral outcomes of training. In addition, motivation to learn mediated the effects of pre-training self-efficacy and fairness perceptions on these outcomes. The final set of hypotheses dealt with the relationship between fairness perceptions, performance outcomes, and affective outcomes of training.

Hypotheses 11 through 14 predicted that fairness perceptions and performance outcomes would be positively related to training reactions. The zero-order correlations showed that those who perceived their training assignments as fair were more likely to report positive attitudes toward the training program as a whole. However, a test of the independent effects of fairness and performance outcomes failed to provide support to these hypotheses.

There are several possible reasons for these results. First, the smaller sample size resulting from listwise deletion, along with the relatively large number of predictors, may have resulted in low levels of statistical power (Cohen, 1988). However, when pairwise deletion is used, similar results are observed. Second, it is simply possible that no relationship exists between performance outcomes and training reactions (Alliger & Janak, 1989). In fact, there is research which suggests that reactions are more a results of pre-training characteristics and may actually lead to differences in performance outcomes (Mathieu, Tannenbaum, & Salas, 1992). Factors related to training reactions will be discussed again later in this section.

Hypotheses 15 through 18 predicted that fairness perceptions and performance outcomes would be positively related to post-training self-efficacy. The results supported Hypothesis 18 which predicted that post-training performance (accuracy) would be related to post-training self-efficacy. These results are consistent with past research on self-efficacy and training effectiveness which show that an individual's past performance is an important component of efficacy judgments (Bandura, 1977; Gist & Mitchell, 1992; Tannenbaum, et al., 1991). Accuracy was the only performance measure which provided the trainee with immediate feedback regarding performance. The presence of this feedback probably accounted for the significant relationship between accuracy and post-training self-efficacy. The lack of relationship between other performance outcomes and post-training self-efficacy could have been due to the lack of feedback from those measures.

The analyses just presented provide evidence for the hypothesized effects of framing of training assignments on training outcomes. How a training program is framed (advanced vs remedial) results in differences in pre-training self-efficacy and fairness perceptions. These differences affect motivation to learn which then affects training outcomes. In addition to these analyses, a series of exploratory analyses were also conducted. Rather than investigating the effects of different frames, the exploratory

analyses determined the effects on framing, positive or negative, against an unframed, or control, group. In this way, any overall effects of framing in key variables can be determined.

Control Group Comparisons. The results of these tests indicate that both experimental groups had lower overall levels of pre-training motivation than the control group. In addition, experimental groups reported lower levels of training reactions compared to the control group. In addition, experimental groups showed less gains in self-efficacy as a result of training than control groups after taking into account differences in pre-training self-efficacy. No differences in performance outcomes were found between experimental and control groups. These results suggest that framing training assignments based on differences in performance levels tends to have the largest impact on how an individual perceives the training experience and the resulting level of efficacy developed from this experience. However, as evidenced by the results of the experimental groups, there was evidence for a direct effect between framing and accuracy. Those assigned to remedial training were more accurate in performing the Air Defense Task than those assigned to advanced training. The implications of these findings on training research and practice are now discussed.

Implications and Directions for Future Research

The results of this study are consistent with mounting evidence in the training literature which suggests that training effectiveness is more than just a function of training design (Baldwin, Magjuka, & Loher, 1991; Mathieu, Tannenbaum, & Salas, 1992; Noe, 1986; Quiñones, Ford, Sego, & Smith, under review). Pre-training context and individual characteristics can influence training outcomes beyond any training design effects. The results of this study have implications for research and practice in a number of areas related to training effectiveness.

Framing. First, this study suggests that training assignments are not value free. Clearly, the intent of training programs is to develop or improve a specific set of skills (Goldstein, 1993). However, the way in which the need for training is framed can affect an individual's pre-training characteristics. These findings are consistent with recent research on framing effects and training (Martocchio & Webster, 1992). This is an important finding given the recent trends toward a continuous learning strategy (Noe & Ford, 1992). Organizations must take into account the way in which different training programs are perceived by organizational members. Future research could examine the way in which training programs acquire different frames over time.

The results observed also suggest there are a number of ways in which organizations can communicate expectations to individuals. In this case, the framing of training assignments led some individuals to believe that they were high performers whereas others thought they were low performers. Research on the "Galatea Effect" has shown that interventions or situations which boost an individual's expectations regarding future performance usually lead to actual increases in performance (cf. Eden & Kinnar, 1991).

In addition, supervisors or coworkers may develop expectations about others' performance based on training assignments. Individuals may actually expect less from someone who has been assigned to a "remedial" training program. By contrast, a certain degree of "halo" may develop around someone assigned to specialized or "advanced" training. Research has shown that expectations about others can result in differences in performance on the part of these other individuals. This is the "Pygmalion" effect discussed earlier (cf. Eden & Shani, 1982). Future research could examine the extent to which training assignments "stigmatize" individuals and affect others' behavior toward them.

The results of this study are also consistent with the work by Dweck regarding learning versus mastery orientations (Dweck, 1986). Making training assignments contingent on past performance may set up a mastery orientation and decrease an individual's overall reactions to the learning experience. In addition, motivation to learn may be decreased. Negative reactions could undermine the philosophical underpinnings of a continuous learning strategy. Future research could examine the extent to which framing affects attitudes toward training in general, and the organization's training programs, in particular.

The present study also has implications for research on aptitude/treatment interactions. Not only must researchers take care of any potential side effects of categorizing programs and individuals, but they must also begin to examine individual characteristics related to training effectiveness. Research must go beyond looking at general cognitive ability as the most important determinant of differences in reactions to training programs (e.g. Fleishman & Mumford, 1989). Clearly attributions and self perceptions of training needs can influence training effectiveness. Research could examine other individual difference variables such as personality characteristics which could be related to how different training programs are perceived.

Since attributions can affect reactions to training assignments, perhaps attributional training can help ensure that individuals do not make attributions which are likely to lower their perceptions of efficacy (Fosterling, 1985). Research is needed on the effectiveness of attributional interventions in eliminating any negative effects of training assignments on efficacy perceptions.

The control group comparisons, however, do suggest that assigning individuals to remedial training resulted in higher levels of accuracy. This suggests that the negative feedback implied in remedial assignments actually led to higher levels of performance. Thus, even though the proposed mechanisms examined in this study were generally

supported, this direct mechanism was also found. These findings are similar to those obtained by Podsakoff & Farh (1989). In that study, individuals who were given negative feedback performed at higher levels than those receiving positive feedabck. However, the study also found a positive relationship between self-efficacy and performance. In addition, similarly to the present study, no direct relationship was found between feedback sign and self-efficacy.

These findings suggest that two parallel processes are responsible for creating higher levels of performance. First, self-efficacy enhancement resulted in higher motivation to learn and actual learning, which was then related to performance. On the other hand, giving negative feedback resulted in significantly better performance. This brings into question whether one should be concerned about negative framing or whether negative framings might actually be beneficial.

The current study suggests that, at least in the short term, individuals may actually do better if the are assigned to a remedial program. However, this conclusion must be tempered by the fact that this was a novel task which participants were only performing once and in which most individuals expected to be assigned to remedial training (74% of participants expected to be assigned to remedial training). There is a body of literature which suggests that repeated negative feedback can lead to many negative outcomes (Ilgen, Fisher, & Taylor, 1979). The concept of learned helplessness is based on the principle that, when confronted with continued failure, an organism will just give up (Seligman, 1975). Research suggest that continued persitence is necessary for task performacne (Gist & Mitchell, 1992).

The educational literature also suggests that continued negative feedback is detrimental to prolonged motivation and learning (Rosenthall & Jacobson, 1968; Schunk, 1982). It appears that attributions may be a key component in this process. In a novel task, individuals may be more likely to take negative feedback as evidence of their lack of

experience with the task. However, with more familiar tasks, individuals may tend to discount negative feedback and lower their motivation going into training. Therefore, future research is needed which examines the effects of negative feedback due to training assignments over a longer period of time and with tasks which are familiar to the participant. This research is needed before firm recomendations can be made ragarding the most effective way to increase training performacne through framing. In the meantime, the large body of research evidence suggests that one needs to build up an individual's level of confidence while at the same time providing a certain level of challenge. It may be best to challenge people through more explicit ways than by telling them they need to go to remedial training. The long term consequences of such repeated negative feedback may be too great.

Needs Assessment. The results of this study suggest that individuals can have preferences regarding training program assignments based on self-perceptions of performance which in turn affect training effectiveness. The needs assessment phase of a training intervention can set up expectations regarding the type of program that is likely to be developed. Noe (1986) has suggested that individual reactions to skill assessment are likely to affect their pre-training characteristics. Care must be taken to ensure that inaccurate expectations regarding training program design and assignments are not being formed.

Motivation to Learn. The results of the present study are consistent with past findings showing the importance of motivation to learn on training effectiveness (Mathieu, Tannenbaum, & Salas, 1992; Noe, 1986; Ryman & Biersner, 1975). Individuals motivated to learn tend to master more of the training content and apply this learning to task performance. However, research has also shown that interventions designed to increase motivation may actually decrease learning (Kanfer & Ackerman, 1989). The results of this study suggest that, rather than focusing motivational interventions on individual trainees,

interventions should focus on contextual factors which tend to lower motivation to learn. Giving individuals the chance to choose their own training programs and ensuring that these preferences are honored could go a long way towards increasing trainee motivation (Baldwin, Magjuka, & Loher, 1991; Hicks & Klimoski, 1987; Martocchio & Webster, 1992).

Furthermore, research could examine other factors which can inhibit or enhance motivation to learn. For example, recent research suggests that perceptions of situational constraints can lower motivation to learn (Mathieu, Tannenbaum, & Salas, 1992). Other factors such as supervisory attitudes toward training or a "climate for training" are likely to affect motivation to learn. Given the recent move towards continuous improvement as a general business strategy, research on the effects on these variables on motivation to learn is sorely needed.

Fairness Perceptions. This study represents the first attempt at determining the role of fairness perceptions on training effectiveness. To the extent that individuals do not have free access to unlimited types of training programs, perceptions regarding the process used to determine training assignments, as well as actual training assignments themselves, are likely to represent a potential threat to a successful training intervention. Research is needed in order to determine methods of distributing training which are perceived as fair by individuals. The results of this study clearly show that training assignments which are consistent with an individual's perceptions of training needs lead to higher fairness perceptions.

Future research is also needed to determine the long-term effects of poor fairness perceptions (cf. Gilliland, in press). For example, research on organizational justice has shown that fairness perceptions are related to organizational commitment (Folger & Konovsky, 1989; Fryxell & Gordon, 1989). This lack of commitment is likely to lead to fewer attempts at transferring trained material back on the job (Ford et al., 1992). In

addition to designing good training programs, research must determine fair ways of determining who is to receive this training program.

Study Limitations

The present study has several potential limitations which must be taken into account when interpreting the results and designing future studies. First, the use of college students may limit the generalizability of the effects. Future studies should attempt to get a diverse group of participants who are at different stages of development. It is possible that older workers, who know their own skills well, may react differently when given feedback in the form of training assignments.

Secondly, future studies should study framing effects in training programs designed to teach more "generic" skills such as literacy or math courses for adults. In addition, studies could examine more technical courses such as computer training. The task used in this study was chosen in order to limit any effects of previous task experience. Having tested the hypothesized relationships, studies could now determine how experience affects the observed relationships. Perhaps the effect may be stronger for tasks for which an individual has had a lot of experience. It is more likely that under high experience situations, individuals have a pretty strong idea about their level of skill. Therefore, fairness perceptions may be very sensitive to framing in this situation.

Thirdly, the training course investigated may have been shorter than those used in organizations. Courses lasting a half day or a few days may be more common (Goldstein, 1993). For longer courses, sustained motivation may be more critical. Therefore, while the length of the course used in this study may have been short, motivational effects were found. In longer courses, it may be expected that motivation to learn is a more powerful predictor of training outcomes. Future studies should examine the relationship between course length, motivation to learn, and training outcomes.

Finally, most of the measures in this study were collected from the same source. The potential for method variance is always present. However, the lack of extremely high intercorrelations in the presence of high reliabilities suggests that this may have not been a problem. Also the presence of siginificant interactions also suggests that method variance was not a problem. Future studies could employ coworkers or supervisors for collecting measures such as motivation to learn.

Conclusion

Despite the limitations cited above, this study makes a number of contributions to the training literature. First, it suggests that individuals are not passive recipients of training assignments. The way in which training programs are framed can enhance or diminish the effectiveness of training interventions. Second, individuals react differently to training assignments. Self-perceptions of training needs as well as attributions can determine the extent to which training assignments affect pre-training characteristics. Third, this study highlights the importance of motivation in training effectiveness. Training program design must go beyond delivery issues if they are to maximize training outcomes. Finally, this study highlights the importance of a systems approach to training. Training is a value-laden activity which is embedded within a larger organizational reality. Training researchers and practitioners must consider a number of broader issues when designing training interventions.

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APPENDICES

APPENDIX A

Training Materials

AIR DEFENSE TASK

REMEDIAL TRAINING MANUAL

INTRODUCTION

Past research on this task has shown that individuals who are classified as below average on the Air Defense Task might benefit from a remedial training course covering a variety of aspects relating to the task. This training manual is a result of this research. The manual consists of four major parts. The first part is a review of the general overview of the task as well as the instructions for determining the overall threat level of a given target. The second section describes in more detail how to determine the point at which a target changes threat levels based on their value on a given attribute (e.g. speed, corridor status, etc.). The third section describes some helpful strategies for measuring the nine target attributes which should aid you in determining the threat level and the corresponding response. Finally, some keyboard shortcuts or "hot keys" are described which should decrease the time that it takes you to measure the attributes and make your decision.

The experimenter will guide you through this training manual. You will be allowed ample time to review the material before going on to each new section. If you finish a section before the allotted time you may consider going back and reviewing the material again. **Do not start a new section before being instructed to do so by the experimenter.** As you may already have noticed, there is a lot of material to memorize. Try to learn as much as you can. If you pay close attention to the material presented in this manual you should be able to perform the Air Defense Task very effectively.

SECTION 1

Review of General Instructions

AIR DEFENSE TASK

INTRODUCTION

The year is 1994 and you are part of a U.S. naval carrier group's command and control team stationed in the middle east. A regional conflict between two nations in this area has recently broken out. Your mission is to protect sea-going commercial traffic in the area from accidental and intentional attacks. As history indicates, this is a highly sensitive task. For example, in 1987, an Iraqi jet accidentally fired two Exocet missiles into the Frigate USS Stark, killing 37 American servicemen and crippling the vessel. One year later, the USS Cruiser Vincennes accidentally shot down an Iranian passenger plane killing 290 innocent civilians. Any repeat of mistakes of this kind will probably lead to a withdrawal of American forces from the area. Such a withdrawal would have disastrous economic and political ramifications that would spread well beyond this region.

THE TASK FORCE

A naval carrier battle team is an awesome array of ships and support units. It consists of a concentric ring of missile firing warships which protect the aircraft carrier at its center. The aircraft carrier, in return, provides an overall umbrella of air protection for the entire task force. The carrier's 90 planes can unleash air strikes against targets at land, sea, and even underwater. A carrier group can dominate up to 196,000 square miles of ocean. Your carrier group consists of the Carrier itself, a Ticonderoga class Aegis Cruiser, AWACs reconnaissance planes and a land based Coastal Air Defense (CAD) unit. Although the Carrier itself is equiped with some air patrol capacities, the Cruisers, AWACs and CAD units provide the bulk of air traffic patrol. Taken together, the air patrol groups of the Carrier, the Cruiser, the AWACs and the CAD unit make up the command and control team.

TEAM MISSION

The team of which you are a part, will role play the Commanding Officers of various units in the carrier group. Your mission is to monitor the air space surrounding the carrier group, making sure that neutral ships are not attacked. In performing this role, you must make certain that you do not allow loss of life resulting from accidental or intentional attacks on ships in the task force. At the same time, it is also of paramount importance that you do not inadvertently shoot down friendly military aircraft or civilian aircraft. Many passenger flights move in and out of the region, and friendly military aircraft from nations not involved in the conflict also patrol the area. The navy can ill-afford any mistakes of either the Stark or Vincennes variety.

DECISIONS

Your task is to decide what response the carrier group should make toward incoming aircraft. Aircraft that are being tracked on radar are called targets. You base your decisions on data you collect by measuring characteristics of the air targets. These measures are obtained from sophisticated radar equipment. You must make a critical choice regarding each target. There are five potential responses, IGNORE, MONITOR, WARN, READY, and DEFEND. These are described below:

IGNORE: This means that the carrier group should devote no further attention to the target, but instead focus on other possible targets in the area. The group should never ignore a target that might possibly attack. This would most assuredly lead to loss of lives on the ship attacked.

MONITOR: Here the carrier group should continuously track the target on radar. A carrier group can monitor only a few targets, thus monitoring diminishes the group's overall patrol capacity.

WARN: In this case the carrier group sends a message to the target indentifying the group and alerting the target to steer clear. Warning targets that should be ignored detracts from the salience of legitimate warnings. Warning targets that intend to attack is also bad, since the warning makes it easier for the attacker to locate the ship.

READY: This means to steer the ship into a defensive posture and to set defensive weapons on automatic. A ship in a readied position is rarely vulnerable to attack. This stance should not be taken to non-threatening targets since weapons set to automatic can fire mistakenly at innocent targets that fly too close to the carrier group. A ship in this position cannot readily use offensive weapons on th target.

DEFEND: This is "weapons away" and means to attack the target with Tomahawk cruise missiles. A defend decision cannot be aborted once initiated. Defend is an appropriate response when you feel an attack is imminent.

CHARACTERISTICS OF TARGETS

The incoming air targets can be measured on nine attributes. These are listed below along with the ranges of possible values on the attributes:

(1) **SPEED:** 100 to 800 miles per hour (mph)

(2) **ALTITUDE:** 5,000 to 35,000 feet

(3) **SIZE:** size of the target ranging from 10 to 65 meters

(4) **ANGLE:** -15 (rapid descent) to +15 degrees (rapid ascent)

(5) **IFF:** "Identification Friend or Foe". This is a radio signal that identifies whether an aircraft is civilian, para-military, or military, ranging from .2 Mhz (an airliner) to 1.8 Mhz (a fighter).

(6) **DIRECTION:** from +30 degrees (passing far to the east or west of the carrier) to 0 degrees (coming straight to the carrier).

(7) **CORRIDOR STATUS:** a corridor is a lane open to commercial air traffic. Status is expressed in terms of miles from the center of the corridor, ranging from 0 miles (in the middle of it) to 30 miles (way out of it)

(8) **RADAR TYPE:** the kind of radar possessed by the aircraft ranging from Class 1 (weather radar only to Class 9 (weapons radar)

(9) **RANGE:** distance of the aircraft from the Carrier ranging anywhere from 0 to 200 miles

DETERMINING THE LEVEL OF THREAT

In general, the degree to which an incoming target is threatening depends on its standing on these nine attributes. There are five simple rules to remember in determining the danger associated with any target:

(a) all else being equal, in terms of IFF, military targets are more threatening than civilian targets (see attribute #5)

(b) SPEED and DIRECTION go together, so that fast targets coming straight in are most threatening (see #1 and #6 above). Speed alone and direction alone mean nothing. There is nothing to fear if fast targets are not headed toward the group. There is nothing to fear from slow objects headed directly for the group.

(c) ANGLE and RANGE go together, so that descending targets that are close are especially threatening (see #4 and #9 above). Angle alone and range alone mean nothing. Descending targets that are far away, or close targets that are on the way up are not threatening.

(d) ALTITUDE and CORRIDOR STATUS go together, so that low flying targets that are way outside the corridor are especially threatening (see #2 and #7 above). Altitude alone and corridor status alone mean nothing. There is nothing to fear from high flying targets well outside the corridor or low flying targets in the middle of the corridor.

(e) SIZE and RADAR go together, so that small objects with weapons radar are especially threatening (see #3 and #8 above). There is nothing to fear from small targets with weather radar only or from large targets with weapons radar.

RANGE OF ATTRIBUTES

The following chart will help you determine the level of threat associated with the different values of all nine attributes.

Degree of Threat

	Non-Threatening	Somewhat Threatening	Very Threatening
Speed	100-275 mph	325-500 mph	600-800 mph
Altitude	35,000-27,000 ft	23,000-17,000 ft	13,000-5,000 ft
Size	65-43 m	37-23 m	17-10 m
Angle	+15 to +8 dgs	+3 to -3 dgs	-8 to -15 dgs
IFF	.2 to .6 Mhz	.9 to 1.1 Mhz	1.4 to 1.8 Mhz
Direction	30 to 22 dgs	18 to 12 dgs	8 to 0 dgs
Corridor St.	0 to 8 mi	12 to 18 mi	22 to 30 mi
Radar Type	Class 1 & 2	Class 5	Class 8 & 9
Range	200 to 110 mi	90 to 60 mi	40 to 1 mi

HOW RULES COMBINE TO DETERMINE JUDGEMENTS

The five rules combine to determine overall threat represented by the target. So for example, if a team detected a (a) military aircraft that is (b) flying in straight and fast, (c) was close and descending, (d) was flying low and way outside the corridor, and (e) was small and had weapons radar; the ship is being attacked and should DEFEND.

If the team detected (a) a civilian aircraft, that is (b) passing slow at an angle, (c) was far away and ascending, (d) was flying high and in the middle of the corridor and (e) was large and had weather radar; this is a passanger plane that should be IGNORED.

Intermediate responses like MONITOR, WARN, or READY are to be used when the target is threatening according to some of the rules but not all. For example, a military aircraft that is close and descending (see rule c), small and with weapons radar (see rule e), but is traveling slowly at an angle to the group (see rule b), and is high and in the middle of the corridor (see rule d) might need to be WARNED. It should not be IGNORED, but neither should it be shot down.

DECISION OUTCOMES

Once you make your decision to either IGNORE, MONITOR, WARN, READY, or DEFEND, you will be provided with feedback regarding your performance. Five outcomes can result from the defensive posture that you choose. These are:

HIT: A hit means that your decision was exactly correct. So for example, the target should have been "warned" and that was exactly what the team decided. A hit is worth 2 points to your overall score. The color bars at the top and bottom of the screen will be green when this occurs.

NEAR MISS: A near miss means that you were off by one place in terms of your agressiveness level. For example, if your decision was "warn" when it should have been "monitor" this would be a near miss (a little too aggressive). It would also be a near miss if your decision was "warn" when it should have been "ready" (a little too passive). A near miss is a pretty good outcome. A near miss is worth 1 point. The color bars at the top and bottom of the screen will be aquamarine when this occurs.

MISS: A miss means that your decision was off by two places. This is worth 0 points. The color bars will be purple when this occurs.

INCIDENT: An incident means that your decision was off by three places. An incident means that you just narrowly avoided disaster (e.g. being hit yourself or mistakenly shooting down a friendly target). This outcome results in a loss of 1 point. The color bars will be red when this occurs.

DISASTER: A disaster means that your decision was off by four places. This outcome results in a loss of 2 points. The color bars will be black in this case.

SECTION 2

Threat Level Points of Inflection

Determining Threat Level

As you learned in section 1, the correct response is determined by the level of threat associated with the nine attributes of the target. However, you also learned that the relationship between the attributes and threat level is somewhat complicated. Some attributes combine so that the level of threat is determined by the joint value of two attributes. These rules are listed below:

(a) all else being equal, in terms of IFF, military targets are more threatening than civilian targets (see attribute #5)

(b) SPEED and DIRECTION go together, so that fast targets coming straight in are most threatening (see #1 and #6 above). Speed alone and direction alone mean nothing. There is nothing to fear if fast targets are not headed toward the group. There is nothing to fear from slow objects headed directly for the group.

(c) ANGLE and RANGE go together, so that descending targets that are close are especially threatening (see #4 and #9 above). Angle alone and range alone mean nothing. Descending targets that are far away, or close targets that are on the way up are not threatening.

(d) ALTITUDE and CORRIDOR STATUS go together, so that low flying targets that are way outside the corridor are especially threatening (see #2 and #7 above). Altitude alone and corridor status alone mean nothing. There is nothing to fear from high flying targets well outside the corridor or low flying targets in the middle of the corridor.

(e) SIZE and RADAR go together, so that small objects with weapons radar are especially threatening (see #3 and #8 above). There is nothing to fear from small targets with weather radar only or from large targets with weapons radar.

As you can see from the rules above, there are four "combination rules" or rules that relate threat levels based on the values of two attributes. The key to determining if any particular combination is threatening is to determine whether any one of the components is threatening. This is the function of the table listed below.

Degree of Threat

	Non-Threatening	Somewhat Threatening	Very Threatening
Speed	100-275 mph	325-500 mph	600-800 mph
Altitude	35,000-27,000 ft	23,000-17,000 ft	13,000-5,000 ft
Size	65-43 m	37-23 m	17-10 m
Angle	+15 to +8 dgs	+3 to -3 dgs	-8 to -15 dgs
IFF	.2 to .6 Mhz	.9 to 1.1 Mhz	1.4 to 1.8 Mhz
Direction	30 to 22 dgs	18 to 12 dgs	8 to 0 dgs
Corridor St.	0 to 8 mi	12 to 18 mi	22 to 30 mi
Radar Type	Class 1 & 2	Class 5	Class 8 & 9
Range	200 to 110 mi	90 to 60 mi	40 to 1 mi

You may have noticed from the table above that the point at which an attribute changes from non-threatening to somewhat threatening and from somewhat threatening to very threatening is ambiguous. For example, non-threatening SIZE ranges from 65-43 m, however, somewhat threatening SIZE ranges from 37-23 m. You can see that the change from one threat level to the other occurs somewhere between 43m and 37m. This is called the POINT OF INFLECTION. For each of the nine attributes there are two points of inflection. These correspond to the changes from non-threatening to somewhat threatening and from somewhat threatening to very threatening.

An efficient strategy for determining threat level is to know the two points of inflection for each of the nine attributes. This way if an attribute that is part of a combination is below the point of inflection for non-threatening, you know that the combination is non-threatening. This is a very efficient strategy which will help you perform better on the Air Defense Task. The table below presents the points of inflection for all nine attributes. Your task for this section of the training course is to memorize these values.

From the combination rules, you also learned that if any one of the two attributes is non-threatening, the entire combination is non-threatening. Threfore, if you can only memorize a few of these numbers, you should try to memorize the left hand column. This is the point at which an attribute goes from non-threatening to somewhat threatening.

POINTS OF INFLECTION

	Non to Somewhat Threatening	Somewhat to Very Threatening
SPEED	300 mph	550 mph
ALTITUDE	25,000 ft	15,000 ft
SIZE	40 m	19 m
ANGLE	+ 6 dgs	- 6 dgs
IFF	.75 Mhz	1.25 Mhz
DIRECTION	20 dgs	10 dgs
CORRIDOR STATUS	10 mi	20 mi
RADAR TYPE	Class 3	Class 7
RANGE	100 mi	50 mi

SECTION 3

Measurement Strategies

When a target appears, your job is to measure the nine attributes and determine the appropriate response depending on the level of threat of the target. Through various keystrokes which will be explained in detail in the next section, you will open a MEASURE box. In this box you will see all nine attributes listed. Once you measure all the attributes you can review the values with the SUMMARY function found in the MEASURE box. The values will be listed in the order in which they were measured. Given this fact, an important strategy to employ is to measure the attributes in such a way that they facilitate your judgments regarding the interactions between attributes. For example, if SIZE and RADAR go together, measuring SIZE then RADAR puts these two values next to each other in the SUMMARY box thus facilitating your decision making process. Below is a suggested order of measurement which should make your task easier. The attributes which go together are listed together. The important part of this list is which attributes should be next to each other on the REVIEW box and not necessarily the entire order. For example, as you can see from the list SIZE and RADAR go together. However, these two attributes can be measured at any time as long as they are measured together. Remember that IFF goes by itself.

RECOMMENDED ORDER OF MEASUREMENT

IFF

SPEED
DIRECTION

ANGLE
RANGE

ALTITUDE
CORRIDOR STATUS

SIZE
RADAR

If you can't memorize all the attributes in this order, at least try to remember the letters in each word that are outlined. These correspond to the "HOT KEYS" which you will learn how to operate in the next section.

SECTION 4

"Hot Key" Operation

There are a number of ways to operate the MEASURE, SUMMARY, and JUDGEMENT commands. As stated in the last section, the MEASURE box allows you to measure the values of the nine attributes of the target. The SUMMARY command allows you to review all the information that you have measured about the target. The JUDGMENT box allows you to record the appropriate judgment for the particular target.

MEASURE

When a new target appears you must first measure the target on the nine attributes in order to determine the level of threat. This can be accomplished by pressing the ALT key until the menu-bar is highlighted then pressing either the DOWN-ARROW or the ENTER key. This opens up the MEASURE box. In the box, all nine attributes are listed.

To measure an attribute you can either (1) ARROW DOWN to highlight the appropriate attribute (e.g. Speed) and press the ENTER key or (2) press the RED highlighted letter for the attribute that you want to measure. This highlighted letter is known as the HOT KEY. Most of the time the HOT KEY is the first letter of the attribute (e.g. S for Speed) but not always.

When you measure an attribute the value will be shown in a box for a few seconds. You don't have to memorize this value. The measured values are stored in the SUMMARY box which you can access at any time.

SUMMARY

There are two ways to get to the SUMMARY box. The first is by opening the MEASURE box (ALT key then ENTER) and going down with the ARROW KEY to SUMMARY. The second is much quicker and more efficient. The summary key comes up on the screen every time you press the F2 key.

You can access the SUMMARY box as many times as you need. Only the attributes that you have measured will appear in this box. They will appear in the order that you measured them. This is why it is important to measure the attributes so that the attributes that go together appear next to each other in this box. Once you have measured all the attributes and determined the level of threat you must make a JUDGMENT.

JUDGMENT

To make a judgment (e.g. Defend) you must open the JUDGMENT box. To accomplish this press the ALT key to highlight the MENU BAR. You can then either ARROW RIGHT to Judgment and press ENTER or simply press J after highlighting the MENU BAR.

At this point you must render a judgment. You can either ARROW DOWN to the appropriate judgment or press the red HOT KEY for your judgment.

Once you have recorded your judgment you will see a feedback screen and a new trial will start.

STRATEGY

Given that your performance will be based on both the accuracy of your judgments as well as the number of targets that you encounter it is to your advantage to memorize and utilize the keyboard shortcuts and HOT KEYS described above.

APPENDIX B

Locus of Control 1 Scale

Using the scale below indicate your level of agreement with the following items. Do not answer how you think you are expected to answer. Answer in an honest fashion.

1 = *Strongly Disagree*
2 = *Disagree*
3 = *Neither agree nor disagree*
4 = *Agree*
5 = *Strongly Agree*

____ 1. Becoming a success is a matter of hard work; luck has little or nothing to do with it.

____ 2. In the long run, people get the respect they deserve in this world.

____ 3. When I make plans, I am almost certain I can make them work.

____ 4. What happens to me is my own doing.

____ 5. Without the right breaks one cannot be a good leader.

____ 6. Many of the unhappy things in people's lives are partly due to bad luck.

____ 7. In my case, getting what I want has little to do with luck.

____ 8. Who gets promoted often depends on who was lucky enough to be in the right place first.

____ 9. Most people don't realize the extent to which their lives are controlled by accidental happenings.

____ 10. Many times I feel I have little influence over the things that happen to me.

____ 11. In the long run, the bad things that happen to us are balanced by the good ones.

APPENDIX C

Rotter's (1966) Locus of Control Scale

PART I: For each of the following pairs of statements choose the one which most closely reflects your feelings and attitudes. There are no right answers. Answer in an honest fashion and not in the way in which you think you are expected to answer. Mark only ONE statement per pair.

1.f. a. Children get into trouble because their parents punish them too much.
b. The trouble with most children nowadays is that their parents are too easy with them.

2. a. Many of the unhappy things in people's lives are partly due to bad luck.
b. People's misfortunes result from the mistakes they make.

3. a. One of the major reasons why we have wars is because people don't take enough interest in politics .
b. There will always be wars, no matter how hard people try to prevent them.

4. a. In the long run people get the respect they deserve in this world.
b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he or she tries.

5. a. The idea that teachers are unfair to students is nonsense.
b. Most students don't realize the extent to which their grades are influenced by accidental happenings.

6. a. Without the right breaks one cannot be an effective leader.
b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. a. No matter how hard you try, some people just don't like you.
b. People who can't get others to like them don't understand how to get along with others.

8.f. a. Heredity plays the major role in determining one's personality.
b. It is one's experience in life which determine what one is like.

9. a. I have often found what is going to happen will happen.
b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10. a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
b. Many times exam questions tend to be so unrelated to course work that studying is really useless.

11. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
    b. Getting a god job depends mainly on being in the right place at the right time.

12. a. The average citizen can have an influence in government decisions.
    b. This world is run by the few people in power, and there is not much the little guy can do about it.

13. a. When I make plans, I am almost certain that I can make them work.
    b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14.f. a. There are certain people who are just no good.
    b. There is some good in everybody.

15. a. In my case, getting what I want has little or nothing to do with luck.
    b. Many times we might just as well decide what to do by flipping a coin.

16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
    b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.

17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
    b. By taking an active part in political and social affairs the people can control world events.

18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
    b. There is really no such thing as "luck."

19.f. a. One should always be willing to admit mistakes.
    b. It is usually best to cover up one's mistakes.

20. a. It is hard to know whether or not a person really likes you.
    b. How many friends you have depends on how nice a person you are.

21. a. In the long run the bad things that happen to us are balanced out by the good ones.
    b. Most misfortunes are the result of lack of ablity, ignorance, laziness, or all three.

22. a. With enough effort we can wipe out political corruption.
    b. It is difficult for people to have much control over the things politicians do in office.

23. a. Sometimes I can't understand how teachers arrive at the grades they give.
    b. There is a direct connection between how hard I study and the grades I get.

24.f .a. A good leader expects people to decide for themselves what they should do.
    b. A good leader makes it clear to everybody what their jobs are.

25. a. Many times I feel that I have little influence over the things that happen to me.
    b. It is impossible for me to believe that chance or luck plays an important role in my life.

26. a. People are lonely because they don't try to be friendly.
    b. There's not much use in trying too hard to please people, if they like you, they like you.

27.f. a. There is too much emphasis on athletics in high school.
    b. Team sports are an excellent way to build character.

28. a. What happens to me is my own doing.
    b. Sometimes I feel that I don't have enough control over the direction my life is taking.

29. a. Most of the time I can't understand why politicians behave the way they do.
    b. In the long run the people are responsible for bad government on a national as well as on a local level.

---

f = filler item

APPENDIX D

Self-Esteem Scale

Using the scale below indicate your level of agreement with the following items. Do not answer how you think you are expected to answer. Answer in an honest fashion.

1 = *Strongly Disagree*
2 = *Disagree*
3 = *Neither agree nor disagree*
4 = *Agree*
5 = *Strongly Agree*

____ 1. I feel I am a person of worth, at least on an equal basis with others.

____ 2. I feel that I have a number of good qualities.

____ 3. All in all, I am inclined to feel that I am a failure.

____ 4. I am able to do things as well as most other people.

____ 5. I feel I do not have much to be proud of

____ 6. I take a positive attitude toward myself.

____ 7. On the whole, I am satisfied with myself.

____ 8. I wish I could have more respect for myself.

____ 9. I certainly feel useless at times.

____ 10. At times I think I am no good at all.

APPENDIX E

Pre-Training Knowledge Measure

PART I: Mark the correct answer for each of the questions below. Make sure to mark your answers on this form as well as the computer form.

1) 1.5 Mhz represents which of the following?

   a) A non-threatening target.
   b) A somewhat threatening target.
   c) A very threatening target.
   d) A target on the border between two threat levels.
   e) A target that is out of the possible range of values.

2) +20 degrees of angle represents which of the following?

   a) A non-threatening target.
   b) A somewhat threatening target.
   c) A very threatening target.
   d) A target on the border between two threat levels.
   e) A target that is out of the possible range of values.

3) 5 miles outside the corridor represents which of the following?

   a) A non-threatening target.
   b) A somewhat threatening target.
   c) A very threatening target.
   d) A target on the border between two threat levels.
   e) A target that is out of the possible range of values.

4) 35 degrees of direction represents which of the following?

   a) A non-threatening target.
   b) A somewhat threatening target.
   c) A very threatening target.
   d) A target on the border between two threat levels.
   e) A target that is out of the possible range of values.

5) Class 10 radar type represents which of the following?

a) A non-threatening target.
b) A somewhat threatening target.
c) A very threatening target.
d) A target on the border between two threat levels.
e) A target that is out of the possible range of values.

6) 400 miles per hour represents which of the following?

a) A non-threatening target.
b) A somewhat threatening target.
c) A very threatening target.
d) A target on the border between two threat levels.
e) A target that is out of the possible range of values.

7) 30,000 foot altitude represents which of the following?

a) A non-threatening target.
b) A somewhat threatening target.
c) A very threatening target.
d) A target on the border between two threat levels.
e) A target that is out of the possible range of values.

8) 20 meters represents which of the following?

a) A non-threatening target.
b) A somewhat threatening target.
c) A very threatening target.
d) A target on the border between two threat levels.
e) A target that is out of the possible range of values.

9) 25 miles outside the corridor represents which of the following?

a) A non-threatening target.
b) A somewhat threatening target.
c) A very threatening target.
d) A target on the border between two threat levels.
e) A target that is out of the possible range of values.

10) 850 miles per hour represents which of the following?

a) A non-threatening target.
b) A somewhat threatening target.
c) A very threatening target.
d) A target on the border between two threat levels.
e) A target that is out of the possible range of values.

11) Class 1 radar represents which of the following?

a) A non-threatening target.
b) A somewhat threatening target.
c) A very threatening target.
d) A target on the border between two threat levels.
e) A target that is out of the possible range of values.

12) -12 degrees of angle represents which of the following?

a) A non-threatening target.
b) A somewhat threatening target.
c) A very threatening target.
d) A target on the border between two threat levels.
e) A target that is out of the possible range of values.

13) 80 miles for range represents which of the following?

a) A non-threatening target.
b) A somewhat threatening target.
c) A very threatening target.
d) A target on the border between two threat levels.
e) A target that is out of the possible range of values.

14) Which of the following combinations represents a more threatening target?

a) slow and land radar targets
b) high flying and fast targets
c) descending and inside traffic corridor targets
d) outside the traffic corridor and high flying targets
e) close and descending targets

15) Which of the following combinations represents a more threatening target?

a) slow targets with weather radar
b) high flying and fast targets
c) descending and inside traffic corridor targets
d) small targets with weapons radar
e) close and ascending targets

16) Which of the following combinations represents a more threatening target?

a) slow and land radar targets
b) high flying and fast targets
c) descending and inside traffic corridor targets
d) fast targets headed toward the group
e) close and ascending targets

17) Which of the following combinations represents a more threatening target?

a) slow and land radar targets
b) high flying and fast targets
c) descending and inside traffic corridor targets
d) outside the traffic corridor and low flying targets
e) close and ascending targets

18) All else equal, which of the following is/are characteristic(s) of a threatening target?

a) Low flying targets.
b) Military targets.
c) Targets with weather radar
d) 2 of the above are characteristics of a threatening target.
e) 3 of the above are characteristics of a threatening target.

19) All else equal, which of the following is/are characteristic(s) of a threatening target?

a) Targets that are high flying.
b) Targets with weapons radar.
c) Targets that are fast and inside the traffic corridor.
d) Targets that are descending and close.
e) Targets that are large and descending.

20) All else equal, which of the following is/are characteristic(s) of a threatening target?

a) Targets that are large.
b) Targets with weather radar.
c) Targets that are fast and coming straight in.
d) Targets that are small and inside the traffic corridor.
e) Targets that are ascending and close.

APPENDIX F

Pre-Training Performance Measure

PART I: For the following targets, make the appropriate decision regarding the defensive posture which you should take. Mark your answer on both forms.

1:

SPEED:	172 miles per hour (mph)
ALTITUDE:	10,248 feet
SIZE:	10 meters
ANGLE:	-14 degrees
IFF:	1.3 Mhz
DIRECTION:	4 degrees
CORRIDOR STATUS:	29 miles
RADAR TYPE:	Class 2
RANGE:	31 miles

YOUR DECISION (circle):

(1) IGNORE

(2) MONITOR

(3) WARN

(4) READY

(5) DEFEND

· 2:

SPEED:	321 miles per hour (mph)
ALTITUDE:	26,605 feet
SIZE:	41 meters
ANGLE:	9 degrees
IFF:	.7 Mhz
DIRECTION:	21 degrees
CORRIDOR STATUS:	19 miles
RADAR TYPE:	Class 4
RANGE:	108 miles

YOUR DECISION (circle):

(1) IGNORE

(2) MONITOR

(3) WARN

(4) READY

(5) DEFEND

3:

SPEED:	291 miles per hour (mph)
ALTITUDE:	14,321 feet
SIZE:	21 meters
ANGLE:	-6 degrees
IFF:	.7 Mhz
DIRECTION:	9 degrees
CORRIDOR STATUS:	21 miles
RADAR TYPE:	Class 6
RANGE:	101 miles

YOUR DECISION (circle):

(1) IGNORE

(2) MONITOR

(3) WARN

(4) READY

(5) DEFEND

4:

SPEED:	591 miles per hour (mph)
ALTITUDE:	14,016 feet
SIZE:	19 meters
ANGLE:	-6 degrees
IFF:	1.3 Mhz
DIRECTION:	9 degrees
CORRIDOR STATUS:	11 miles
RADAR TYPE:	Class 7
RANGE:	43 miles

YOUR DECISION (circle):

(1) IGNORE

(2) MONITOR

(3) WARN

(4) READY

5) DEFEND

5:

SPEED:	172 miles per hour (mph)
ALTITUDE:	10,248 feet
SIZE:	14 meters
ANGLE:	-14 degrees
IFF:	1.6 Mhz
DIRECTION:	4 degrees
CORRIDOR STATUS:	23 miles
RADAR TYPE:	Class 2
RANGE:	31 miles

YOUR DECISION (circle):

(1) IGNORE

(2) MONITOR

(3) WARN

(4) READY

(5) DEFEND

6:

SPEED:	281 miles per hour (mph)
ALTITUDE:	14,018 feet
SIZE:	21 meters
ANGLE:	-7 degrees
IFF:	.7 Mhz
DIRECTION:	10 degrees
CORRIDOR STATUS:	21 miles
RADAR TYPE:	Class 6
RANGE:	106 miles

YOUR DECISION (circle):

(1) IGNORE

(2) MONITOR

(3) WARN

(4) READY

(5) DEFEND

7:

SPEED:	595 miles per hour (mph)
ALTITUDE:	14,937 feet
SIZE:	19 meters
ANGLE:	-4 degrees
IFF:	1.3 Mhz
DIRECTION:	9 degrees
CORRIDOR STATUS:	21 miles
RADAR TYPE:	Class 4
RANGE:	49 miles

YOUR DECISION (circle):

(1) IGNORE

(2) MONITOR

(3) WARN

(4) READY

(5) DEFEND

8:

SPEED:	597 miles per hour (mph)
ALTITUDE:	16,115 feet
SIZE:	18 meters
ANGLE:	-6 degrees
IFF:	1.3 Mhz
DIRECTION:	19 degrees
CORRIDOR STATUS:	21 miles
RADAR TYPE:	Class 4
RANGE:	109 miles

YOUR DECISION (circle):

(1) IGNORE

(2) MONITOR

(3) WARN

(4) READY

(5) DEFEND

9:

SPEED:	345 miles per hour (mph)
ALTITUDE:	6,525 feet
SIZE:	14 meters
ANGLE:	-10 degrees
IFF:	1.7 Mhz
DIRECTION:	7 degrees
CORRIDOR STATUS:	0 miles
RADAR TYPE:	Class 1
RANGE:	75 miles

YOUR DECISION (circle):

(1) IGNORE

(2) MONITOR

(3) WARN

(4) READY

(5) DEFEND

10:

SPEED:	299 miles per hour (mph)
ALTITUDE:	16,768 feet
SIZE:	18 meters
ANGLE:	-6 degrees
IFF:	1.3 Mhz
DIRECTION:	9 degrees
CORRIDOR STATUS:	23 miles
RADAR TYPE:	Class 2
RANGE:	31 miles

YOUR DECISION (circle):

(1) IGNORE

(2) MONITOR

(3) WARN

(4) READY

(5) DEFEND

APPENDIX G

Perceived Performance Scale

Using the scale below indicate your level of agreement with the following items. These items measure how well **YOU THINK** you performed on the Training Assignment Test. Do not answer how you think you are expected to answer. Answer in an honest fashion.

1 = *Strongly Disagree*
2 = *Disagree*
3 = *Neither agree nor disagree*
4 = *Agree*
5 = *Strongly Agree*

____ 1. I performed very well on this test.

____ 2. I know I did better than most people on this test.

____ 3. I did pretty bad on this test.

____ 4. I performed terribly during this test.

____ 5. My performance on this test was excellent.

APPENDIX H

Expected Training Assignment

Based on my performance on the Training Assignment Test, I am certain I should be assigned to (check the appropriate training):

_____ Advanced Training: I performed very well and deserve advanced training.

_____ Remedial Training: I performed very poorly and need remedial training.

APPENDIX I

Attributions Scale

Using the scale below indicate your level of agreement with the following items. These items are intended to measure what you feel were the main causes for your performance during the Training Assignment Test. Do not answer how you think you are expected to answer. Answer in an honest fashion.

1 = *Strongly Disagree*
2 = *Disagree*
3 = *Neither agree nor disagree*
4 = *Agree*
5 = *Strongly Agree*

Luck Attributions

____ 1. My performance on the Training Assignment Test was due to luck.

____ 2. Other causes resulted in my performance on the Training Assignment Test, luck had nothing to do with it.

____ 3. My performance on the Training Assignment Test was due to causes outside of myself which I have no influence over.

____ 4. I had nothing to do with my performance on the Training Assignment Test.

____ 5. I had no control over my level of performance on the Training Assignment Test.

Effort Attributions

____ 1. I performed at the level that I did because of the amount of effort I put into this test.

____ 2. My level of effort resulted in my level of performance on the Training Assignment Test.

____ 3. My level of effort had nothing to do with my performance on the Training Assignment Test.

____ 4. I was responsible for my performance on the Training Assignment Test because of the amount of effort I put into the test.

____ 5. Effort played no part in my performance on the Training Assignment Test.

Task Difficulty Attributions

____ 1. I performed at the level that I did because of the difficulty of the test.

____ 2. The type of test was responsible for my performance on the Training Assignment Test.

____ 3. Characteristics of the test caused my performance on the Training Assignment Test.

____ 4. Characteristics of the test had nothing to do with my performance on the Training Assignment Test.

____ 5. I probably would have performed differently with another type of test.

Ability Attributions

____ 1. My performance level was due to my inborn ability to perform on this types of tests.

____ 2. My ability was responsible for my performance on the Training Assignment Test.

____ 3. My ability had nothing to do with my performance on the Training Assignment Test.

____ 4. My performance on the Training Assignment Test would have been different if it wasn't for my inborn ability.

____ 5. My inborn ability caused my performance on the Training Assignment Test.

APPENDIX J

Pre-Training Self-Efficacy Scale

Using the scale below indicate your level of agreement with the following items. These items are intended to measure your confidence in performing the Air Defense Task. Do not answer how you think you are expected to answer. Answer in an honest fashion.

1 = *Strongly Disagree*
2 = *Disagree*
3 = *Neither agree nor disagree*
4 = *Agree*
5 = *Strongly Agree*

____ 1. I feel confident in my ability to perform the Air Defense Task effectively.

____ 2. I think I can eventually reach a high level of performance on the Air Defense Task.

____ 3. I am sure I can learn how to perform this task effectively in a relatively short period of time.

____ 4. I don't feel that I am as capable of performing the Air Defense Task as other people.

____ 5. On the average, other people are probably much more capable of performing this task as I am.

____ 6. I am a fast learner for these types of tasks, in comparison to other people.

____ 7. I am not sure I can ever reach a high level of performance on this task, no matter how much practice and training I get.

____ 8. It would take me a long time to learn how to perform this task effectively.

____ 9. I am not confident that I can perform this task successfully.

____ 10. I doubt that my performance will be very adequate on the Air Defense Task.

APPENDIX K

Fairness Perceptions Scale

Using the scale below indicate your level of agreement with the following items. These items are intended to measure your perceptions regarding your training assignment. Do not answer how you think you are expected to answer. Answer in an honest fashion.

1 = *Strongly Disagree*
2 = *Disagree*
3 = *Neither agree nor disagree*
4 = *Agree*
5 = *Strongly Agree*

DISTRIBUTIVE JUSTICE

____ 1. I believe that the decision to assign me to (remedial, advanced) training was a fair one.

____ 2. I deserved to be assigned to (remedial, advanced) training.

____ 3. I think it is unfair that I was assigned to (remedial, advanced) training.

____ 4. I seriously question my assignment to (remedial, advanced) training.

____ 5. The decision to assign me to (remedial, advanced) training was a fair one.

____ 6. I would disagree with anyone who tried to tell me that the decision to send me to (remedial, advanced) training was a fair one.

____ 7. Given my performance on the task, I think my training assignment is really unjustified.

____ 8. I consider the decision to assign me to (remedial, advanced) training to be a fair outcome.

____ 9. I would have made the same training assignment in my own case.

____ 10. I am really disappointed about my training assignment.

PROCEDURAL JUSTICE

____ 1. The test used to make training assignments was not a reliable and valid indicator of my ability to perform the Air Defense Task.

____ 2. The test used to make training assignments is an unfair test of a person's true ability to perform the Air Defense Task.

____ 3. Using the Training Assignment Test to make assignmnets was unfair.

____ 4. The procedure used to make training assignments included consistent standards for assigning people.

____ 5. The assignment procedure obtained accurate information about each person's abilities to perform the Air Defense Task.

____ 6. The assignment decisions were influences by things which should not have been considered.

____ 7. Under the circumstances, the process used to decide training assignments was fair.

____ 8. I have strong doubts that the Training Assignment Test really measures a person's ability to perform the Air Defense Task.

____ 9. I feel other procedures should have been used to make training assignments.

____ 10. The Training Assignment Test should not have been used to make training assignments.

APPENDIX L

Motivation to Learn Scale

Using the scale below indicate your level of agreement with the following items. These items are intended to measure how motivated you are to learn the material presented in the (remedial, developmental) course to which you have been assigned. Do not answer how you think you are expected to answer. Answer in an honest fashion.

1 = *Strongly Disagree*
2 = *Disagree*
3 = *Neither agree nor disagree*
4 = *Agree*
5 = *Strongly Agree*

____ 1. I am motivated to learn the skills emphasized in the (remedial, advanced) training program.

____ 2. I will try to learn as much as I can during this training course.

____ 3. I want to improve my performance on the Air Defense Task.

____ 4. I am going to put forth a lot of effort during this (remedial, advanced) training program.

____ 5. I am going to blow off this training program.

____ 6. I don't expect to pay much attention to the material presented during this (remedial, advanced) training program.

____ 7. I am very unmotivated to learn anything during this training course.

____ 8. If I can't understand some part of the training, I will try harder.

____ 9. I have no desire to increase my performance on this task.

____ 10. I really could care less about learning anything in this training course.

APPENDIX M

Learning Measure

1) At which point does Speed change from non-threatening to somewhat threatening?

   a) 550 mph
   b) 300 mph
   c) 100 mph
   d) 275 mph
   e) 325 mph

2) At which point does Altitude change from non-threatening to somewhat threatening?

   a) 23,000 ft
   b) 13,000 ft
   c) 35,000 ft
   d) 25,000 ft
   e) 15,000 ft

3) At which point does Size change from non-threatening to somewhat threatening?

   a) 40 m
   b) 37 m
   c) 17 m
   d) 65 m
   e) 10 m

4) At which point does Corridor Status change from non-threatening to somewhat threatening?

   a) 0 mi
   b) 12 mi
   c) 30 mi
   d) 22 mi
   e) 10 mi

5) At which point does Radar change from non-threatening to somewhat threatening?

   a) Class 1
   b) Class 5
   c) Class 3
   d) Class 8
   e) Class 10

6) At which point does IFF change from non-threatening to somewhat threatening?

a) 1.4 Mhz
b) .75 Mhz
c) .2 Mhz
d) 1.1 Mhz
e) 1.8 Mhz

7) Which of the following pairs of attributes should be measured so that they appear next to each other on the SUMMARY box?

a) Speed and Direction
b) IFF and Angle
c) Altitude and Size
d) Radar and Direction
e) Angle and Direction

8) Which of the following pairs of attributes should be measured so that they appear next to each other on the SUMMARY box?

a) Size and Range
b) IFF and Radar
c) Altitude and Radar
d) Angle and Range
e) Speed and Corridor Status

9) Which of the following pairs of attributes should be measured so that they appear next to each other on the SUMMARY box?

a) Size and Radar
b) IFF and Corridor Status
c) Angle and Radar
d) Speed and Angle
e) Size and Speed

10) Which of the following pairs of attributes should be measured so that they appear next to each other on the SUMMARY box?

a) IFF and Radar
b) Angle and Direction
c) Corridor Status and IFF
d) Altitude and Radar
e) Altitude and Corridor Status

11) Which of the following is the fastest way to open the SUMMARY box?

a) ALT then S
b) F2
c) F4
d) ALT then ENTER then S
e) none of the above

12) Which of the following keys activates the menu bar?

a) TAB
b) ENTER
c) DOWN ARROW
d) F2
e) ALT

13) When the menu bar is highlighted, which of the following keys can both be used to open the menu selection?

a) F2 and TAB
b) ENTER and DOWN-ARROW
c) CNTRL and ENTER
d) SHIFT and DEL
e) DOWN-ARROW and SHIFT

APPENDIX N

Training Reactions

Using the scale below indicate your level of agreement with the following items. These items are intended to measure your confidence in performing the Air Defense Task. Do not answer how you think you are expected to answer. Answer in an honest fashion.

1 = *Strongly Disagree*
2 = *Disagree*
3 = *Neither agree nor disagree*
4 = *Agree*
5 = *Strongly Agree*

____ 1. I found the training program to be very useful.

____ 2. I liked the training program.

____ 3. I'm glad I attended this training course.

____ 4. The training course was a waste of time.

____ 5. I didn't get anything out of the training program.

____ 6. I learned very interesting and useful information during the training course.

____ 7. The training course was well prepared.

____ 8. I should have never been made to attend the training program.

____ 9. I think the training program made me better able to perform the Air Defense Task.

____ 10. My performance on the Air Defense Task was completely unaffected by what I learned in the training course.

APPENDIX O

Participant Consent Forms

CONSENT FORM
(experimental groups)

AIR DEFENSE TASK TRAINING STUDY

This study investigates the effectiveness of two specially designed training programs in improving performance on a computer task. In the first of two sessions, you will be asked to complete a Training Assignment Test as well as a few other measures. This first session will last approximately one hour. You will then be asked to sign up for a susequent session in which you will be assigned to one of two training programs. You will then be given an opportunity to work on the Air Defense Task. This second session should last approximately two hours.

Your participation in this study is strictly voluntary and you may refuse to answer any questions which you may find inappropriate without any penalty. In addition, you can discontinue the experiment if you feel it necessary to do so. However, in order to receive credit you must attent BOTH SESSIONS. Your individual results in this study will be CONFIDENTIAL. You will be assigned a unique three-digit number which will appear on all questionnaire forms. The experimenter will only report the final data in an aggregate form which does not allow any particular individual to be identified. These aggregate results of the experiment will be available from the experimenter.

If you have any questions or concerns following this study you may contact Miguel Quiñones at 353-9166.

I have read the consent form and choose to participate in this study:

SIGNED:_____

NAME:_____

DATE: _____ / _____ / _____

CONSENT FORM
(control group)

AIR DEFENSE TASK TRAINING STUDY

This study investigates the effectiveness of a specially designed training program in improving performance on a computer task. In the first of two sessions, you will be asked to complete a Knowledge Test as well as a few other measures. This first session will last approximately one hour. In the second session you will receive training and then given the opportunity to work on the computer task. This second session should last around two hours.

Your participation in this study is strictly voluntary and you may refuse to answer any questions which you may find inappropriate without any penalty. In addition, you can discontinue the experiment if you feel it necessary to do so. However, in order to receive credit you must attend BOTH SESSIONS. Your individual results in this study will be CONFIDENTIAL. You will be assigned a unique three-digit number which will appear on all questionnaire forms. The experimenter will only report the final data in an aggregate form which does not allow any particular individual to be identified. These aggregate results of the experiment will be available from the experimenter.

If you have any questions or concerns following this study you may contact Miguel Quiñones at 353-9166.

I have read the consent form and choose to participate in this study:

SIGNED:_____

NAME:_____

DATE: _____ / _____ / _____

APPENDIX P

General Instructions

AIR DEFENSE TASK TRAINING STUDY

General Instructions

AIR DEFENSE TASK

INTRODUCTION

The year is 1994 and you are part of a U.S. naval carrier group's command and control team stationed in the middle east. A regional conflict between two nations in this area has recently broken out. Your mission is to protect sea-going commercial traffic in the area from accidental and intentional attacks. As history indicates, this is a highly sensitive task. For example, in 1987, an Iraqi jet accidentally fired two Exocet missiles into the Frigate USS Stark, killing 37 American servicemen and crippling the vessel. One year later, the USS Cruiser Vincennes accidentally shot down an Iranian passenger plane killing 290 innocent civilians. Any repeat of mistakes of this kind will probably lead to a withdrawal of American forces from the area. Such a withdrawal would have disastrous economic and political ramifications that would spread well beyond this region.

THE TASK FORCE

A naval carrier battle team is an awesome array of ships and support units. It consists of a concentric ring of missile firing warships which protect the aircraft carrier at its center. The aircraft carrier, in return, provides an overall umbrella of air protection for the entire task force. The carrier's 90 planes can unleash air strikes against targets at land, sea, and even underwater. A carrier group can dominate up to 196,000 square miles of ocean. Your carrier group consists of the Carrier itself, a Ticonderoga class Aegis Cruiser, AWACs reconnaissance planes and a land based Coastal Air Defense (CAD) unit. Although the Carrier itself is equiped with some air patrol capacities, the Cruisers, AWACs and CAD units provide the bulk of air traffic patrol. Taken together, the air patrol groups of the Carrier, the Cruiser, the AWACs and the CAD unit make up the command and control team.

TEAM MISSION

The team of which you are a part, will role play the Commanding Officers of various units in the carrier group. Your mission is to monitor the air space surrounding the carrier group, making sure that neutral ships are not attacked. In performing this role, you must make certain that you do not allow loss of life resulting from accidental or intentional attacks on ships in the task force. At the same time, it is also of paramount importance that you do not inadvertently shoot down friendly military aircraft or civilian aircraft. Many passenger flights move in and out of the region, and friendly military aircraft from nations not involved in the conflict also patrol the area. The navy can ill-afford any mistakes of either the Stark or Vincennes variety.

DECISIONS

Your task is to decide what response the carrier group should make toward incoming aircraft. Aircraft that are being tracked on radar are called targets. You base your decisions on data you collect by measuring characteristics of the air targets. These measures are obtained from sophisticated radar equipment. You must make a critical choice regarding each target. There are five potential responses, IGNORE, MONITOR, WARN, READY, and DEFEND. These are described below:

IGNORE: This means that the carrier group should devote no further attention to the target, but instead focus on other possible targets in the area. The group should never ignore a target that might possibly attack. This would most assuredly lead to loss of lives on the ship attacked.

MONITOR: Here the carrier group should continuously track the target on radar. A carrier group can monitor only a few targets, thus monitoring diminishes the group's overall patrol capacity.

WARN: In this case the carrier group sends a message to the target indentifying the group and alerting the target to steer clear. Warning targets that should be ignored detracts from the salience of legitimate warnings. Warning targets that intend to attack is also bad, since the warning makes it easier for the attacker to locate the ship.

READY: This means to steer the ship into a defensive posture and to set defensive weapons on automatic. A ship in a readied position is rarely vulnerable to attack. This stance should not be taken to non-threatening targets since weapons set to automatic can fire mistakenly at innocent targets that fly too close to the carrier group. A ship in this position cannot readily use offensive weapons on th target.

DEFEND: This is "weapons away" and means to attack the target with Tomahawk cruise missiles. A defend decision cannot be aborted once initiated. Defend is an appropriate response when you feel an attack is imminent.

CHARACTERISTICS OF TARGETS

The incoming air targets can be measured on nine attributes. These are listed below along with the ranges of possible values on the attributes:

(1) **SPEED:** 100 to 800 miles per hour (mph)

(2) **ALTITUDE:** 5,000 to 35,000 feet

(3) **SIZE:** size of the target ranging from 10 to 65 meters

(4) **ANGLE:** -15 (rapid descent) to +15 degrees (rapid ascent)

(5) **IFF:** "Identification Friend or Foe". This is a radio signal that identifies whether an aircraft is civilian, para-military, or military, ranging from .2 Mhz (an airliner) to 1.8 Mhz (a fighter).

(6) **DIRECTION:** from +30 degrees (passing far to the east or west of the carrier) to 0 degrees (coming straight to the carrier).

(7) **CORRIDOR STATUS:** a corridor is a lane open to commercial air traffic. Status is expressed in terms of miles from the center of the corridor, ranging from 0 miles (in the middle of it) to 30 miles (way out of it)

(8) **RADAR TYPE:** the kind of radar possessed by the aircraft ranging from Class 1 (weather radar only to Class 9 (weapons radar)

(9) **RANGE:** distance of the aircraft from the Carrier ranging anywhere from 0 to 200 miles

DETERMINING THE LEVEL OF THREAT

In general, the degree to which an incoming target is threatening depends on its standing on these nine attributes. There are five simple rules to remember in determining the danger associated with any target:

(a) all else being equal, in terms of IFF, military targets are more threatening than civilian targets (see attribute #5)

(b) SPEED and DIRECTION go together, so that fast targets coming straight in are most threatening (see #1 and #6 above). Speed alone and direction alone mean nothing. There is nothing to fear if fast targets are not headed toward the group. There is nothing to fear from slow objects headed directly for the group.

(c) ANGLE and RANGE go together, so that descending targets that are close are especially threatening (see #4 and #9 above). Angle alone and range alone mean nothing. Descending targets that are far away, or close targets that are on the way up are not threatening.

(d) ALTITUDE and CORRIDOR STATUS go together, so that low flying targets that are way outside the corridor are especially threatening (see #2 and #7 above). Altitude alone and corridor status alone mean nothing. There is nothing to fear from high flying targets well outside the corridor or low flying targets in the middle of the corridor.

(e) SIZE and RADAR go together, so that small objects with weapons radar are especially threatening (see #3 and #8 above). There is nothing to fear from small targets with weather radar only or from large targets with weapons radar.

RANGE OF ATTRIBUTES

The following chart will help you determine the level of threat associated with the different values of all nine attributes.

Degree of Threat

	Non-Threatening	Somewhat Threatening	Very Threatening
Speed	100-275 mph	325-500 mph	600-800 mph
Altitude	35,000-27,000 ft	23,000-17,000 ft	13,000-5,000 ft
Size	65-43 m	37-23 m	17-10 m
Angle	+15 to +8 dgs	+3 to -3 dgs	-8 to -15 dgs
IFF	.2 to .6 Mhz	.9 to 1.1 Mhz	1.4 to 1.8 Mhz
Direction	30 to 22 dgs	18 to 12 dgs	8 to 0 dgs
Corridor St.	0 to 8 mi	12 to 18 mi	22 to 30 mi
Radar Type	Class 1 & 2	Class 5	Class 8 & 9
Range	200 to 110 mi	90 to 60 mi	40 to 1 mi

HOW RULES COMBINE TO DETERMINE JUDGEMENTS

The five rules combine to determine overall threat represented by the target. So for example, if a team detected a (a) military aircraft that is (b) flying in straight and fast, (c) was close and descending, (d) was flying low and way outside the corridor, and (e) was small and had weapons radar; the ship is being attacked and should DEFEND.

If the team detected (a) a civilian aircraft, that is (b) passing slow at an angle, (c) was far away and ascending, (d) was flying high and in the middle of the corridor and (e) was large and had weather radar; this is a passanger plane that should be IGNORED.

Intermediate responses like MONITOR, WARN, or READY are to be used when the target is threatening according to some of the rules but not all. For example, a military aircraft that is close and descending (see rule c), small and with weapons radar (see rule e), but is traveling slowly at an angle to the group (see rule b), and is high and in the middle of the corridor (see rule d) might need to be WARNED. It should not be IGNORED, but neither should it be shot down.

DECISION OUTCOMES

Once you make your decision to either IGNORE, MONITOR, WARN, READY, or DEFEND, you will be provided with feedback regarding your performance. Five outcomes can result from the defensive posture that you choose. These are:

HIT: A hit means that your decision was exactly correct. So for example, the target should have been "warned" and that was exactly what the team decided. A hit is worth 2 points to your overall score. The color bars at the top and bottom of the screen will be green when this occurs.

NEAR MISS: A near miss means that you were off by one place in terms of your agressiveness level. For example, if your decision was "warn" when it should have been "monitor" this would be a near miss (a little too aggressive). It would also be a near miss if your decision was "warn" when it should have been "ready" (a little too passive). A near miss is a pretty good outcome. A near miss is worth 1 point. The color bars at the top and bottom of the screen will be aquamarine when this occurs.

MISS: A miss means that your decision was off by two places. This is worth 0 points. The color bars will be purple when this occurs.

INCIDENT: An incident means that your decision was off by three places. An incident means that you just narrowly avoided disaster (e.g. being hit yourself or mistakenly shooting down a friendly target). This outcome results in a loss of 1 point. The color bars will be red when this occurs.

DISASTER: A disaster means that your decision was off by four places. This outcome results in a loss of 2 points. The color bars will be black in this case.

APPENDIX Q

Participant Debriefing Forms

EXPERIMENTAL GROUPS

Thank you very much for your participation in this study. The purpose of this study was to examine the effects of assigning individuals to differently framed or labeled training programs. Educational systems as well as work organizations routinely assign individuals to different training programs without considering the feedback implications that these assignments can have. You may be well aware of the negative consequences of assigning a child to a class called "Special Ed". These labels can have demoralizing effects on the trainees.

Your training assignment was determined RANDOMLY. Your actual performance on the Training Assignment Test had no bearing on your training assignment. The same was true of all other participants. It is important that you understand that the assignments in no way reflect yours and the other participant's ability to perform the Air Defense Task. It was felt that this minor deception was necessary to investigate the effects of this important phenomenon. I hope that you do not come away from this task feeling differently about your abilities (unless it is more positive!). If you have any questions about the results of the study or feel you would like more information at a later point in time please do not hesitate to contact Miguel A. Quiñones at 353-9166. It is VERY IMPORTANT that you DO NOT DISCUSS this experiment with anyone else until everyone has completed the study. This would be around the end of the term. Talking to other potential participants could jeopardize the usefulness of the results of this study. Again, thank you for your cooperation and good luck during your studies here at Michigan State.

CONTROL GROUP

Thank you very much for your participation in this study. The purpose of this study was to examine the effects of assigning individuals to differently framed or labeled training programs. Educational systems as well as work organizations routinely assign individuals to different training programs without considering the feedback implications that these assignments can have. You may be well aware of the negative consequences of assigning a child to a class called "Special Ed". These labels can have demoralizing effects on the trainees.

You were part of the control group. You did not receive any information regarding labels and training assignments. By having a control group I will be able to establish a "reference point" from which to judge the effects of labeling individuals and training programs. The experimental group's training assignment was determined RANDOMLY. Their actual performance on a Training Assignment Test had no bearing on their training assignment. The same was true of all other participants. It is important that you understand that their assignments in no way reflect theirs and the other participant's ability to perform the Air Defense Task. It was felt that this minor deception was necessary to investigate the effects of this important phenomenon. I hope that you do not come away from this task feeling differently about your abilities (unless it is more positive!). If you have any questions about the results of the study or feel you would like more information at a later point in time please do not hesitate to contact Miguel A. Quiñones at 353-9166. It is VERY IMPORTANT that you DO NOT DISCUSS this experiment with anyone else until everyone has completed the study. This would be around the end of the term. Talking to other potential participants could jeopardize the usefulness of the results of this study. Again, thank you for your cooperation and good luck during your studies here at Michigan State.