This is to certify that the
thesis entitled

BREAKING THE CYCLE OF REMEDIAL TRAINING:
THE EFFECTS OF GAIN AND LOSS FRAMED MESSAGING
ON TRAINING MOTIVATION AND PERFORMANCE

presented by

Adam John Massman

has been accepted towards fulfillment
of the requirements for the

M. A. degree in Psychology

J. Kevin Ford
Major Professor's Signature

July 27, 2009
Date

# BREAKING THE CYCLE OF REMEDIAL TRAINING: THE EFFECTS OF GAIN AND LOSS-FRAMED MESSAGING ON TRAINING MOTIVATION AND PERFORMANCE

By

Adam John Massman

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Psychology

2009

ABSTRACT

BREAKING THE CYCLE OF REMEDIAL TRAINING:
THE EFFETS OF GAIN AND LOSS-FRAMED MESSAGING ON TRAINING MOTIVATION AND PERFORMANCE

By

Adam J. Massman

The current study examined the effects of gain and loss-framed messages during training interventions on training outcomes. Quinones (1995) discovered that remedial training has detrimental effects on various factors that affect training outcomes such as motivation to learn. A model was developed to discover if gain and loss-framed messages during training could result in different levels of motivation and different training outcomes. This study proposed that gain-framed training would improve fairness perceptions, self-efficacy, and motivation to learn. These will in turn affected training outcomes (speed of completing future tasks, accuracy of completing the task, and the transference of knowledge). Additionally, individual differences such as the ideal versus actual self (Higgins, 1987) may affect the participants' ability to receive framed messages effectively. Replicating the basic design of the Quinones (1995) study, participants were randomly assigned to two differently framed remedial training programs (gain and loss-framed training). Results indicated that placing participants in gain-framed training affects training outcomes differently than loss-framed training. Implications for training effectiveness research and practice are discussed.

Acknowledgements

The journey of writing a master's thesis is one that I did not take alone, and for those who joined me, I am forever grateful. Those who have been there by my side for emotional support were just as instrumental as those who were there for intellectual support during the ten-month adventure.

For intellectual support, I give the most gratitude to my master thesis chair, Dr. Kevin Ford. His willingness to push me harder and to help me become a better academic is something that defines him as a person. I could not ask for any better thesis chair. I offer additional thanks to my other two astute committee members, Dr. Steve Yelon and Dr. Rick Deshon. These two incredibly talented academics taught me lessons not only about academia but lessons on how succeed in my future career. Finally, to three research assistants, Lingyan Ye, Josh Glowacki, and Melissa Chestara, who worked without any academic or financial recompense, I am overwhelmed by your contributions and time.

For emotional support, there could be an endless amount of individuals that I could list here. Ultimately, these individuals know who they are but I felt it necessary to list the people whose support helped me fulfill a life dream of holding a masters degree. Thank you to my partner, Alan Johnson, for his ability to help me stay focused and relaxed during the stressful times; Krystin Kohls, for her comedic relief and chart expertise; Julie Strong, for her ingenious technical tweaks that were needed at critical moments; and finally, Stephanie Corder and Nicholas Schroeder for their endless encouragement. As I said before, I thank everyone listed; I hope I can repay them in helping them pursue their life dream.

# Table of Contents

LIST OF TABLES

LIST OF FIGURES

# INTRODUCTION

Training is a powerful force in determining the success of organizations. Accordingly, organizational psychologists have nicknamed businesses that are better able to adapt to changes in society and technology as "learning organizations" (Noe & Ford, 1992). Unfortunately, training is expensive. It is no wonder that with over fifty billion dollars spent annually on training (Dolezalek, 2004), that business administrators are increasingly concerned with training effectiveness (Ford & Weissbein, 1997). Yet, the expense seems to be justified as administrators in thriving organizations spend around two thousand dollars per employee compared to administrators in low performing companies who spend only six hundred dollars per employee (Dolezalek, 2004).

Thus, administrators can justify the cost of effective training (c.f. Birdi et al, 2008). Trainers measure training effectiveness in two ways: the amount of learning and the degree of transfer. Psychologists such as Weiss (1990) note that learning and transfer are related but each has its distinguishing characteristics. Weiss states that learning is a "relatively permanent change in knowledge or skill produced by experience" (p. 172), while Omrod (1999) states that transfer is a condition where existing knowledge, abilities, or skills assist the trainee in the performance of new tasks or affect the next step in the learning process. Both learning and transfer are essential to training effectiveness.

To be effective, trainers must know what affects learning and transfer. Baldwin and Ford (1988) have suggested that learning and transfer are affected by three sets of variables: (1) training program characteristics, (2) environmental

variables, and (3) trainee characteristics. The objectives and mode of instruction in a training program will affect learning and transfer, but the workplace environment in which trainees apply their new knowledge can affect transfer outcomes. For example, supervisors may provide trainees few opportunities to demonstrate their learned skills. Finally, trainee characteristics such as motivation can influence outcomes (Goldstein & Ford, 2002). A brief overview of each one of these factors is presented.

Gagne, Briggs, and Wager (1992) described training characteristics as the events surrounding the training program and the trainee. Campbell (1988) suggested that training be centered on specific learning requirements and learning principles. The first principle, identical elements, notes that identical stimuli and response elements in the training and the transfer setting promote maximum success (Thorndike & Wood, 1901), which Crafts (1935) and Underwood (1951) demonstrated improved motor and verbal behaviors. The second factor, general principles, stipulates that training should incorporate the underlying principles for the training not just the applicable skills. Hendrickson and Schroeder (1941) demonstrated this principle when they taught their participants to improve shooting accuracy by learning the principles of physics. The third, stimulus variability, states that various examples of the trained concept improve generalizability (Ellis, 1965). The final principle states that other variables affect the design of the training such as feedback, whole versus partial training, and mass learning (Briggs & Naylor, 1962).

In addition to training characteristics, the work environment can influence training effectiveness (Eddy, Glad, & Wilksin, 1967). Researchers have examined environmental factors such as choice of training (Baldwin, Magjuka, & Loher, 1991), organizational support (Tannenbaum, 1997), climate (Goldstein, 1986), managerial support (Cohen, 1990), and task opportunity (Ford, Quinones, Sego, & Sorra, 1992). These work environment factors have direct or indirect outcomes on training such as improved learning transfer or increased self-efficacy (Tracey, Hinkin, Tannenbaum, & Mathieu, 2001).

Finally, trainee characteristics have received a significant amount of attention their impact on training outcomes (c.f. Quinones, 1997; Tracey, Hinkin, Tannenbaum, & Mathieu, 2001). Several different individual differences have been found to influence training outcomes (c.f. Baumgartel, Reynolds & Patham, 1984; Kozlowski, Gully, Brown, & Salas, 2001). One of these characteristics is motivation to learn. Mitchell (1982) notes that motivation is the process that causes persistence in behavior and direction, which leads to the amount of time an individual invests in their behavior (Naylor, Pritchard, & Illgen, 1980), and that motivation to learn has been demonstrated to an important factor in the training success (Mathieu & Martineau, 1997; Tracey, Hinkin, Tannenbaum, & Mathieu, 2001; Noe & Schmidt, 1986).

Of these three characteristics, Quinones (1995) and Tracey, Hinkin, Tannenbaum, and Mathieu (2001) note that the effects of trainee characteristics need additional research on training outcomes. Of the vast array of characteristics available to study, motivation to learn and self-efficacy are a few

of the more powerful characteristics. Motivation to learn has been shown to have an impact on self-efficacy (Gist, Schowerer, & Rosen, 1989), locus of control (Judge & Bono, 2001), career commitment (Pond, Nacoste, Mohr, & Rodriguez, 1997). Additionally, Ford et al (1998) discovered that self-efficacy influences the likelihood of transfer.

Because of these variables, researchers are investigating interventions intended to affect motivation to learn and self-efficacy, which may in turn increase training effectiveness (Baldwin & Ford, 1988). Mathieau and Martineau (1997) and Tannenbaum et al (1991) have demonstrated ways to increase these two variables. Additionally, Quinones (1995) found instances where pre-training context has reduced motivation and self-efficacy.

In an effort to continue research in this domain, the focus of this study is to examine the outcomes of training interventions on motivational variables and training outcomes. This study examines the extent to which an intervention during training can influence motivation, self-efficacy, and attitudes, which in turn affects training outcomes. This study further examines an intervention to minimize possible negative impacts on influence motivation, self-efficacy, and attitudes.

This document is organized in the following manner. First, training interventions are reviewed and discussed focusing on trainee choice, trainee expectations, training labels, training assignments, and training feedback. Second, theories of training and workplace mechanisms that affect trainee motivation, self-efficacy, and fairness are explained. Third, an extensive review

of gain and loss labels, and framing effects are presented. Fourth, a conceptual model that explains ways to improve a potentially negative condition, in this case, a remedial training assignment is proposed.

## Training Interventions

Canon-Bowers, Salas, Tannenbaum, and Mathieu (1995) note that the context in which the employee learns the information affects the ability for the knowledge transfer to occur successfully. For example, Rouiller and Goldstein (1993) discovered by looking at 102 manager trainees of a fast-food chain that trainees were not blank slates for knowledge transfer. They uncovered that positive organizational climates affected the degree to which a learned behavior transferred to the job. More recently, Heimbeck, Frese, and Keith (2003) and Joung, Hesketh, and Neal (2006) propose that the work environment and individual characteristics are key components to the success of training interventions. Additionally, employees attend training interventions for different reasons and motivations. A review of training interventions as it relates to this study is now presented, starting with training choice and expectations.

### Training Choice and Expectations

The actual choice of training has an impact on transfer. First looking at voluntary placement, researchers have been interested in whether individual choice to be in the training session versus involuntarily placement in the training intervention affects learning and transfer. Facteau, Dobbins, Russell, Ladd, and

Kudish, (1995) found that employees who voluntarily attended training had increased motivation to learn, which improved long-term training effects. Hicks and Klimoski (1987)'s study similarly found that training choice mattered as the trainee's satisfaction with training and motivation increased when trainees chose to attend the program.

To demonstrate the effects of choice training, Baldwin, Magjuka, & Loher (1991) divided 207 trainees into three groups: no choice of training, choice of training without receiving that choice, and finally choice of training and received that choice in training. Regardless of choice, the content of the course was identical. Baldwin et al discovered that denying their choice of training lowered pre-training motivation to learn and actually decreased learning transfer compared to those who were either allowed their choice or were not allowed to chose at all. Participants who were given the choice of training and then actually participated in that training had the highest levels of motivation and learning transfer. Some researchers such as Tannenbaum, Mathieu, and Cannon (1991) suggest that this is because the expectations of the training were not fulfilled, and this created additional negative outcomes.

With expectation fulfillment, trainees are often affected before they begin their training by internal states such as expectations. Rowold (2007) demonstrated this effect with a group of new employees. Before beginning a training session with newly hired employees at a German call center, employees filled out a survey regarding their expectations of the training intervention. Interestingly, expectation fulfillment was significantly related to subsequent

learning. Those individuals whose expectations were met during the training session were more likely to acquire more knowledge during the training session. In an additional study to link performance on the training task and expectations, Tannenbaum et. al (1991) hypothesized that Naval recruits who indicated their expectations were met would perform higher on the training task. With over a thousand recruits pre-tested for expectations, self-efficacy and training motivation were highly correlated for those who had indicated their expectations had been fulfilled.

This type of expectation modeling may have some moderating variables such as anxiety as one study noted. When Hilling and Tattersall (1997) monitored the training expectations of a course on how to pass a professional exam, those who expected to perform well on the training performed higher. However, these researchers also monitored anxiety level. Those who did not expect to perform as well also had high anxiety; the converse was true as well: those who expected to perform well had lower anxiety.

## Labeling

In addition to the effects of expectations, the effect of training labeling may have an impact on training outcomes. Martocchio (1992) demonstrated that pre-training context using labels had an impact on training outcomes. Dividing the program into "opportunitistic" training group and a "neutral" training group, Martocchio recruited 79 employees at a large university to undergo computer training. Evaluations showed that employees who were told that they could

utilize the training as a way to increase their position in their company had higher scores on computer efficacy, lower computer anxiety scores, and higher learning scores than those who were placed in the neutral training program. He concluded that organizations that pay attention to factors that make employees more excited about learning would enhance the outcomes of their training programs.

Webster and Martocchio (1993) have further demonstrated the importance of labeling. When 68 clerical and administrative employees were asked to complete a training session designed to improve microcomputer skills, the researchers divided the employees into two groups: "play" training and "work" training. The only difference between the training was the label; the courses were taught in the same way. While overall differences between the groups were not significant, younger employees did respond to the "fun" label factor, resulting in higher scores on training outcomes for younger employees.

Finally, Webster and Martocchio (1995) continued to demonstrate effects of labeling of training programs. In a field experiment of 143 employees, Webster and Martocchio divided training into "optimistic," "realistic," and "neutral" training assignments. Each training program was the same; however, how the experimenters described the program changed to fit the tone of optimistic, realistic, or neutral. They found that differences in preview labeling had a significant impact on training outcomes. Optimistic previews related to attention to performance compared to realistic previews. Additionally, realistic preview labels influenced post-training reactions more positively than positive previews.

While these studies demonstrate the effects of training labeling, implicit label training can also influence training outcomes as seen in aptitude-treatment interactions (Kanfer & Ackerman, 1989). Aptitude treatment interactions are effective because the training program is adapted to the different level of ability for the individual. The individual differences between abilities can be targeted in this type of aptitude-treatment-interaction training. Besides the costly implications, assigning individuals to different types of trainings implicitly or explicitly requires training program labels to be created for both the trainer and the trainee. Kanfer and Ackerman (1989) revealed that even if the labels remain neutral, trainees might recognize which individuals are being placed into these different groups. Consequently, these labels can create differences in motivations and attitudes, causing an additional "high level of evaluative baggage" that may have multiple negative outcomes (Quinones, 1995).

The research on labeling effects is not limited to training. Simple cognitive strategists have recognized the impact of cost and benefit framed messaging on decision-making strategy (later referred to as gain and loss framing) (Kahneman & Tversky, 1979). Education specialists, Rosenthal and Jacobson (1968), have found that children work in accordance to the expectations that are explicitly set for them much like labels in training, and these labels effect their performance.

From all these studies, training assignment and labels have been suggested to affect a wide variety of training outcomes. Some researchers suggest that is because trainees view training assignment as feedback.

Training Assignment and Feedback

Organizations are consistently giving feedback (Balcazar, Hopkins, & Suarez, 1986). This feedback can come from multiple sources such as a trainer or a performance review. Each type of feedback has specific outcomes for an employee.

One type of feedback comes from the trainer during training. Martocchio and Webster (1992) demonstrated that sustaining positive feedback throughout a training session had more benefits on trainee performance than negative feedback. Additionally, they noted that self-efficacy increased due to the positive oral and text messages that they received during the training. Martocchio and Dulebohn (1994) demonstrated a similar effect on 86 employees who received software training. Participants who received feedback that was based on factors within the trainee's control had higher software efficacy.

Not as explicit as feedback during training, performance reviews are a common way of overt feedback. Indiscreetly, assignment to specific training programs can be seen as feedback too. If an employee is performing poorly, he or she may be assigned to remedial training; if an employee is performing exceptionally, employees may be sent to advanced training to encourage further growth for promotion. In essence, training assignment may be seen as feedback. As demonstrated by several researchers (Ilgen, Fisher, & Taylor, 1979; Martocchio, 1992), this feedback interacts with the varying levels of attitudes and levels of motivation. Quinones (1995) proposed and test the idea

that training assignment in itself acts as feedback and affects motivation and training outcomes.

To demonstrate this idea, he had undergraduates from a Midwestern university learn a military flight simulation. After prescreening the individuals' knowledge, he assigned them to remedial and advanced training conditions – however, these randomly assigned assignments were not actually based on the pre-training performance on the test. He measured several items during both pre and post-training to see how the actual training assignment affected the individual: perceived performance (how well the individual thought they did), expected assignment (where the individual thought they would be placed based off their pre assessment), pre-training self-efficacy (how well the individual thought he or she would do in future air flight simulations), fairness perceptions (how the individual felt about their assignment), motivation to learn (how willing the participant was to learn the information), learning (how well the individual mastered the training), behavior (the responses of the individual), performance (who accurate the individual was in the responses), and reactions (how useful the training was to the individual).

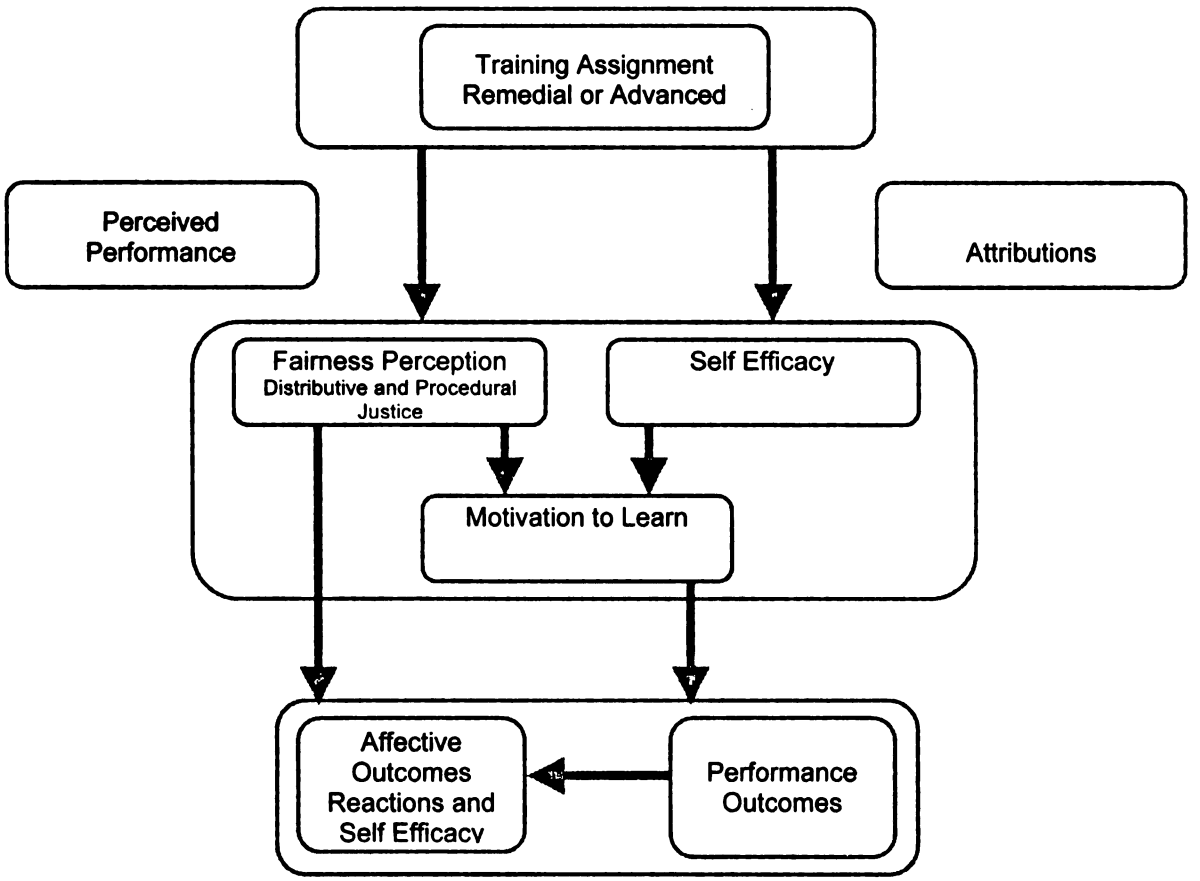



Figure 1. A Conceptual Model Presented by Quinones (1995). *Participants enter two different training assignment conditions. Participants will vary on fairness perceptions, self-efficacy, and motivation to learn. These will in turn affect training outcomes.*

As indicated the resulting conceptual model in Figure 1, Quinones' found that even though 74% of respondents of the training assignment expected to be in the remedial training condition, there was a non-significant relationship between training assignment and locus of control (luck attributions). There were, however, significant interactions between effort, task difficulty, and training

assignment. Individuals who thought their performance on the pre-training test was due to their own inborn ability and were assigned to advanced training showed a higher level of self-efficacy than those who were assigned to the remedial training. In addition, those who had expected to be in the advanced level of training but were placed in remedial training showed decreased levels of perceptions of fairness as compared to those individuals who thought they would be placed in the remedial training and were actually placed in remedial training. In regards to motivation to learn, highly motivated individuals completed more trials than those who did not have a high motivation to learn.

In summary, Quinones demonstrated that training assignment, attributions to assignment, and self-efficacy have important implications for training interventions. Additionally, he noted that motivation to learn was one of the strongest variables that linked trainee characteristics to training outcomes. However, there were virtually no differences in actual performance relevant to differences in motivation to learn. He suggested that this could be due to a low power (around 0.3) and that further research needed to be done to decide more conclusively that motivation to learn has no impact on performance outcomes.

From these studies presented, there are several influences in training interventions, especially increasing motivation to learn. From these studies, framed messaging that includes positive and negative wording may increase the variables that leading to a change in training outcomes. Based on social cognitive theory (Martocchio & Webster, 1992; Quinones, 1995), there is a framework for investigating the effects of framed messages on training. The

following section explores three potential mechanisms by which framing of the training assignment can affect training outcomes. These include self-efficacy, motivation, and fairness perceptions.

Self-Efficacy

Self-efficacy, as defined by Bandura (1997, p. 3) is known, as "the judgment of one's capability to organize and execute the courses of action required to produce given attainments." There are three dimensions to self-efficiency: level (how individuals vary in difficulty level that they are capable of performing), strength (the varying levels of confidence in their ability to accomplish the task), and generality (how the individual generalizes the ability to do a particular activity across a domain or a similar range of activities). In general, as individuals succeed in a task in a particular domain, he or she's self-efficacy will increase.

Translated to a training context, self-efficacy is a trainee's pre-oriented beliefs on how well he or she is at the task being trained on or the belief of how well he or she will learn the information. Messages received before or during the training – either positive or negative – will help trainees compare their performance to the established standard (Bandura, 1977). These messages can affect a trainee's belief on how they will be able to perform on a task in the future, (Bandura, 1991) and then these messages translate into the cognitive representation of different factors such as ability and motivation that will affect future performance (Bandura, 1986).

Self-efficacy has been applied to all different aspects of work performance: higher self-efficacy has lead to higher job performance (Stajkovi & Luthans, 1998). Similarly, Gist and Mitchell (1992) showed that persistence in achieving a goal in the job is based upon higher self-efficacy scores.

In addition to work performance factors, self-efficacy affects training outcomes. In studies done with training on computer skills (Gist, Schwoere, & Rosen, 1989; Martocchio & Webster, 1992), idea generation skills (Gist, 1989), interpersonal complex skills (Gist, Stevens, & Bavetta, 1991), new policy orientation, or other training tasks (Ford, et. al, 1998), when trainees believe in their capabilities to transfer the knowledge they are being trained on, they are more likely to *actually* transfer the knowledge to the workplace. In a step further, when individuals believe they are able to change their performance with the training, the trainee feels confident in his or her abilities to perform at the given task (Holten et. al, 2000).

Self-efficacy is not linked just to training performance but also to educational instruction in the classroom (Garcia & Pintrich, 1994; Pajares, 1996). Students who are higher in self-efficacy outperform individuals with lower self-efficacy in nearly all types of performance tests. Additionally, these students had more persistence in the face of failure than those with lower self-efficacy (Schunk, 1989).

These studies show that the level of self-efficacy consistently relates to various training outcomes. The majority of these studies indeed show that self-efficacy acts as an antecedent variable, which affects the variables of interests.

In regards to training, more researchers are suggesting increasing self-efficacy should be one of the goals of training and more attention needs to be placed on how an individual arrives to their level of self-efficacy (Quinones, 1995).

In addition to Bandura (1982)'s four categories of determinates for self-efficacy (enactive mastery, vicarious experiences, verbal persuasion, and physiological arousal), Gist and Mitchell (1992) outlined three mechanisms by which a person can arrive at their pre-training self-efficacy. In the first step, an individual assesses the task and his or her relationship to the task. Secondly, the individual makes inferences about his or her past performance. Finally, the individual then evaluates the resources available to complete the task.

Translating these factors in a context of the training assignment, individuals who receive remedial training will likely assume his or her assignment is based off past performance, which will lead to lower self-efficacy because of past poor performance. It is therefore critical to minimize the possible impact on lowered self-efficacy. In addition to the negative outcomes of self-efficacy in training, lowered motivation can have an impact on training. A closer look at the research on the relationship between motivation and training outcomes is now reviewed.

## Motivation

As Ford et al (1992) and Noe (1986) have noted, training effectiveness is grounded in the trainee's ability to first master the information and then transfer it to the natural environment. Trainee characteristics have emerged in the field of training research as one of the leading factors of individual outcomes in training

effectiveness. All types of individual differences can targeted to increase training effectiveness such as ability, motivation, and attitudes. Of those, motivation unlike other individual differences such as self-esteem and ability are malleable and may be vulnerable to framed-training (Noe, 1986).

The trainee's motivation to learn has a significant impact on the participants' ability to engage in knowledge transfer. Noe (1986) noted that the motivation to learn is a "trainee's specific desire to learn the content of the training program." In an attempt to find a direct link between motivation and training outcomes, Facteau et al (1995) found that trainees comprised of government managers with high motivation to learn reported higher transfer than those who had lower motivation. Mathieu, Martineau, and Tannenbaum (1993) have also confirmed that trainees with high motivation were more motivated to learn, which, in turn, affected training effectiveness. In addition, Mathieu & Martineau (1997) found that pre-training motivation mediates other characteristics that would transfer outcomes and Tannenbaum et al (1991) discovered that pre-training motivation resulted in higher levels of physical and academic self-efficacy.

Additionally, researchers have suggested that motivation to learn is related to attitudes about the training. Martocchio (1992) suggested that a trainee's pre-training attitudes predicted the ability to learn in a computer-training task. Those participants who believed the training would be beneficial to their learning actually learned the information more than those who had a poor attitude of the training.

These studies suggest that motivation to learn is a key component to training outcomes. However, one component may interact with increasing motivation, fairness perceptions. Participants of training interventions have self-assessments of their own performance in the workplace, and this assessment may be inconsistent with the feedback received from the training assignment. In such a way, perceptions of lower fairness may then lead to lower motivation to learn.

Fairness Perceptions

Fairness perception researchers have concluded that there are at least two distinct types of fairness: distributive (decision outcomes) and procedural justice (the procedures that helped arrive at the decision outcome). Leventhal (1976) determined that individuals decide whether a procedure is fair by: (1) judging whether it follows consistent rules, (2) deciding if the information is accurate, (3) ensuring there is a safeguard against biases, (4) allowing for inaccuracies information to be heard, and (5) following commonly agreed upon terms of moral and ethical standards.

From this perspective, training assignment (remedial or advanced) may be evaluated for distributive justice, and the perception of how the employer decided to place the individual in that assignment would be an issue of procedural justice (Greenberg, 1990). Trainees rate procedural justice to be high if the procedures used to assign followed the five rules outlined above. Typically, participants' judgments of procedural and distributive judgments are often correlated (Folger & Greenberg, 1985) however it is possible for participants to see them unequally if

they feel the process to arriving at a decision was fair but the outcome was unfair.

Quinones (1995) stipulated that trainees are not passive to the assignments that receive. Instead, participants believe they deserve certain assignments. If they receive the "wrong" type of training based off their own self-assessment of their performance, they will have decreased perceptions of fairness for the training. In fact, Quinones found that participants who were assigned remedial assignment but thought they should be assigned to advance training reported lower perceptions of fairness. More importantly, he found a significant relationship between their fairness perception and their effort attributions.

Fryxell and Gordon (1989) found that fairness perceptions affect training outcomes. Remedial assignment may indeed change the fairness perceptions of the individuals, which will then change motivations levels, influencing other important training outcomes.

## Framework for Current Research

Researchers have demonstrated that placing a trainee into remedial training and negative feedback can lead to negative training outcomes. What has received little attention is how to minimize these effects. Researchers from different fields have been working to increase the motivation, self-efficacy, and behavioral changes – several of the variables that Quinones and other researchers have found remedial training to remove. One strategy to improve motivation and self efficacy that would ultimately lead to behavioral changes

employs a manipulation of how messages are framed during the training by utilizing key words and phrases that have implications for the individual such as "gain, "save," "cost," etc. In the present study, the extent to which training outcomes can be altered by providing two types of framed messages were examined: gain (promotion/benefit) and loss (prevention/cost). Specifically, gain-framed messages given during training were hypothesized to remove the negative impacts on motivation, fairness perceptions, and self-efficacy caused by the assignment to remedial training.

When individuals hear framed messages, they assess the message in terms of its personal benefits or costs. In early studies, researchers demonstrated how problems that were "framed" shape one's response to a particular experience. For example, Gomersall and Myers (1966) found that framing behavioral choices in a positively oriented manner is effective in changing behavior, improving motivation, and increasing self-efficacy. Further, Gomersall and Myers assert that framing has been shown to be effective in various fields such as medicine, economics, and psychology. In medicine, Toll et al (2007) discovered that framed messages (a multi-method approach employing textual messages on cessation pamphlets and verbal messages received during the cessation program) facilitate increased motivation to quit smoking and stimulated behavioral changes. In the field of economics, Thaler & Johnson (1990) demonstrated how framed messages modify behavioral responses; and in the area of psychology, Clark and Grote (1998) found that framed messages change attitudes on relationships.

The research is not limited to just these fields. In fact, framing has many implications and definitions for all types of research. In psychology, framing often refers to how people develop a "particular conceptualization" of an issue or their cognitive conceptualization of the world around them (Chong & Druckman, 2007). Igou and Bless (2007) showed that training is involved in practically all levels of cognitive processing from encoding, processing, decision making, and the style in which individuals process information about oneself (Igou & Bless, 2007). Simple framing effects were shown in the United State government's "VERB. Its What You Do." campaign. The VERB campaign was a multimillion-dollar multi-media delivery approach that promoted physical activities in American children from ages 9 to 13. Essentially the VERB campaign used text messages in commercials and advertisements that just said simple things like: "Go play," "Float," and "Run." These simple messages led to behavioral changes (Huhman, et. al, 2007).

Researchers commonly analyze framing effects in human decision making and processes involved in deriving decisions. According to Einhorn and Hogarth (1981), humans do not conform to the rational model of decision-making and utilize several cues to make decisions. In essence, multiple outside factors can affect the decisions making process. One of the major sources of research and theory behind framing is prospect theory.

## Prospect Theory

Prospect theory explains decision-making strategies and how individuals make choices. The theory suggests that the decision maker organizes

applicable information relevant to the decision in two ways: potential benefits or potential costs (see Kahneman & Miller, 1986 for more review on the prospect theory). The individual has a reference point to evaluate the situations in terms of benefits or costs (Kahneman & Tversky, 1979).

Individuals are more sensitive to costs than benefits when making decisions, favoring a preference to sure gains rather than a risky alternative of equal expected value. In a graphical representation, prospect theory takes a S-shaped function: "When behavioral choices involve some risk or uncertainty, individuals are more likely to take these risks when information is framed in terms of relative disadvantages of the behavioral options, that is when the downside of the situation is made salient. Alternatively when behavioral choices involve little risk or uncertainty individuals are more likely to prefer these options when information is framed in terms of the relative advantage, that is, when the upside of a situation is made salient" (Higgins, 1987; Higgins, 2000).

This graphical representation is related to regulatory focus theory. Regulatory focus theory explains that there are two different strategies for self-regulation: one is the pursuit of benefits (or the "avoidance of nongains") and the secondary focus is the avoidance of costs/losses (or the "pursuit of nonlosses") (Higgins, 2000). Multiple researchers have discussed these two theories as the conflict between promotion and prevention focuses (Brendl, Higgins, & Lemm, 1995; Detweiler, Bedell, Salovey, Pronin, & Rothman, 1999)

Framing Effects

Both regulatory focus theory and prospect theory highlight the importance of framing effects (Peter & Richard, 2008). First formally introduced by Kahneman and Tversky (1979), framing effects demonstrate that how the situation is framed, either benefit or cost, will affect someone's risk behavior. As the individual enters a benefit-framed situation, the individual seeks rewarding outcomes. Likewise, when the situation is a cost-framed situation, the individual avoids risky behaviors (Singh, 1986).

To explore the differences in cost versus benefit, Fox and Dayan (2004) placed individuals in different frame sets with investing decisions. In benefit-framed set, participants were told that they had invested money in oil drills and the shares increased by fifty percent. In the cost-framed set, participants were told they had invested money in oil drills and shares had decreased by fifty percent. In both cases, the participants were told that there was also a 50% chance that no additional oil will be found, which would make them lose all their shares. Individuals who were in the benefit-framed set perceived the situation as a financial gain unlike those in the cost-framed. Additionally, when the participant was in the benefit-framed set, the participant was more likely to continue investing despite the future loss potential. The researchers suggested that this happened because the participants focused on the description of the situations.

Tversky and Kahneman (1981) have discovered that descriptors can affect the decision making process because they act as a way to connect the situation to costs versus benefits. This process is called "decision framing."

Several factors from the descriptors influence decision-making processes: habits, personal characteristics, norms, and the formulation of the problem. With several factors affecting decisions, outcomes from identical situations could be rendered differently depending on the formulation of the problem.

Thaler (1985) illustrated the importance of the formulation of the problem. After asking participants to rank the severity of losing a ten-dollar bill versus losing a ten-dollar movie ticket, participants felt that losing ten dollars was more detrimental because it was actual money and the ticket was framed as an item *only* worth ten dollars. Similarly, Ross and Samuels (1993) renamed the problem of the Prisoners Dilemma, calling it either the "Wall Street Game" or the "The Community Game." Those in the Wall Street game were more likely to defect than cooperate because of the label regardless of the fact that both games were identical.

One type of cost-benefit framing that uses the formulation of descriptors is gain (benefit) and loss (cost) framing. Gain-framed messages use benefits and promotion of benefits to persuade behavioral change; loss-framed messages highlight costs and prevention of negatives to encourage behavioral change. In a 1999 study, Detweiler, Bedell, Salovey, Pronin, and Rothman asked participants to watch information on sunscreen safety. They discovered that if an individual is given the opportunity to make a decision when there was gain-framed messages ("Protect yourself from the sun and you will stay healthy"), individuals were more likely to use the sunscreen than if they were presented loss-framed messages ("Don't expose your skin to the sun and you will not become sick"). These results

were reproduced when looking at smoking cessation programs. In a study with one hundred seventy smokers (Schneider, Salovey, Pallonen, Mundord, Smith, & Steward, 2001), a significantly higher amount of smokers were continuously abstinent in the gain-framed condition than in the loss-framed condition (non-smokers will live a healthier life versus smokers will die).

Studies like this have confirmed that gain-loss framed messages are useful in the health industry. More specifically, when behaviors have relatively certain outcomes, individuals are more persuaded by gain-framed messages (Rothman & Salovey, 1997). Consequently, if the outcomes are uncertain like breast cancer, loss-framed outcomes are more persuasive (Schneider, Salovey, Apanocitch, et. al. 2001). These outcomes have been seen across dozens of studies, which have been summarized in a meta-analysis.

O'Keefe and Jensen (2007) looked at 93 different studies that identified themselves as analyzing the differences between gain and loss framing in health promotion. The researchers used a literature search, personal knowledge, and inspection of reference lists to identify the reports that were published up until August 2006. The studies had three criteria: (1) the study compared gain and loss framed messages (and did not include any studies that looked at "combined gain-and-loss frame" such as Treiber, 1986), (2) the study had to advocate health specific behaviors to prevent disease (disease detection was not included), and (3) the study had quantitative data that was appropriate for the meta-analysis (change in attitude or change in behavior were the most common of these effects).

Of the total 21,656 participants, researchers concluded that gain framed appeals were "more persuasive" than loss-framed messages. However, the researchers were skeptical of the results for two reasons. First, the computed correlation of the gain-framed messages to desired behaviors was only 0.03, which they noted was "not necessarily unimportant or trivial." Second, large effect sizes found in hygienic studies overpowered results of gain and loss framing. However, even looking at these differences without hygienic cases, there was still a statistical advantage of gain framing. The researchers noted that gain framing advantages are "exceptionally small and decidedly not general."

Latimer, Salovey, and Rothman (2007) have responded to this meta-analysis by echoing several claims by Cesario et al (2004) and Lee and Aker (2004). First, the meta-analysis only compared medical fields in regards to preventing behaviors in convenient, non-targeted conditions. Current research is attempting to refine framing for the *right, appropriate* condition as seen in Rothman, Bartels, Wlashin, & Salovey (2006). Second, the reason why dental hygiene may have results that are more significant in gain framing is due to the tangible, more obvious outcomes (cavities, gingivitis, etc.) whereas cancer prevention is less tangible (increase likelihood of developing cancer). Third, many studies included in the meta-analysis showed negative effect sizes which was a direct result of their being a clear lack of a negative consequence such as in the studies looking at fruit and vegetable consumption or physical activity

Finally, the effects of gain and loss framing "will remain small to medium sized." The reason for this is that gain and loss-framed message effects are "one

time shots" at attempting to change someone's behavior. This is a relatively huge feat compared to effect sizes seen in the U.S. Center for Disease Control's framed-message VERB campaign (Huhman et al, 2007) because the VERB campaign had multi channel messaging and had longer effect time intervals. Therefore, researchers comparing the results against those of the VERB campaign must take these huge differences into consideration and must also consider that even small effect sizes in gain and loss framing can make a practical difference. Rose (1995) suggested that even small effects in a large group size could have huge implications of change at the population level.

In many domains of framed-messages effects, small to medium effect sizes have been achieved. The areas that have demonstrated significant results in gain and loss-framed messages are now presented, starting with gain and loss-framing's greatest success, health promotion.

*Framing Effects in Health Promotion*

Gain and loss framing can be used to change attitudes on health. Researchers propose that frames are effective in leading the population to use health products when the message is gain framed and paired with a promotion based message ("good health"); conversely, they noted that loss framed appeals are the most effective when the message is paired with prevention ("stop cancer"). Several researchers have demonstrated this effect in such domains as sunscreen use, cancer screening, dental hygiene, and vaccination.

To promote the use of sunscreen, researchers paired the promotion message with a gain-framed message: "Enjoy life! Bask in the warm rays of the

sun, feeling completely happy. Let SunSkin be a part of your daily routine. Enjoy Life." They also paired it with a loss message: "Don't miss out on enjoying life! Not being able to bask in the warm rays of the sun may stand in the way of your feeling completely happy. Let SUNSKIN be part of your daily routine." In the prevention-moderated messages, Lee and Aaker (2004) used gain messaging: "Be safe! Know that you are risk free from sunburns, feeling completely relaxed. Let SunSkin be a part of your daily routine. Be safe." They also used loss framed messaging: "Don't miss out on being safe! Not knowing you are risk-free from sunburns may stand in the way of your feeling completely relaxed. Let SUNSKIN be a part of your daily routine. Don't miss out on being safe." Prevention appeals were more effective with loss framing and promotion was more effective with gain framing. However, in general, the gain frames were still more effective in assisting in health promotion, which was not the case in breast cancer screening.

In reaction to recent increases in breast cancer rates, American and European governments have attempted to identify the best method to promote breast cancer screening. Because most women who are screened for breast cancer are healthy, obtaining a mammogram is actually a psychologically risky behavior because there is a chance of getting abnormal results. However, abnormal results are often presented to patients in probabilistic and uncertain outcomes. Based on these indeterminate outcomes, one hypothesis is that mammograms should be presented in loss-framed messaging, not gain-framed. To test this, 130 women were recruited to watch a fifteen-minute video about

breast cancer and mammography. The gain-framed individuals watched a video called "The Benefits of Mammography" and the loss-framed individuals watched a video called "The Risks of Neglecting Mammography." There were no differences between the contents of the videos. However, after 12 months, 66% of women in the loss-framed set had obtained a mammogram compared to the 52% of women in the gain-framed set (Banks et al, 1995). Schneider et al (2001) replicated the experiment several years later and found the same results: only 36% of the gain framed women received mammograms as compared to 50% with the loss framed individuals. Block and Keller (1995) have found similar results for cervical cancer screening.

Additionally, gain and loss-framed messages have been used in dental hygiene promotion. Rothman, Martino, Detweiler, and Salovey (1999) looked at the effects of messaging on undergraduates' use of mouthwash. One group was given information about a typical mouthwash – one that removes plaque from teeth and prevents tooth decay and gum disease. The other group was shown a new kind of mouthwash – one that detects plague buildup by leaving a discoloration in the areas that need attention. Arguments were presented in both gain and loss framed arguments. As expected, participants in the gain-framed situation were more likely to buy the mouthwash (67%) whereas 47% of the participants would in the loss-framed situation. The same types of results have been seen in vaccinations as well.

In a laboratory experiment to test the effectiveness of gain and loss framed messages encouraging vaccination against the West Nile virus, Bartels,

Kelly, and Rothman (2007) used four groups to ensure that it was the message that actually manipulated behavior and not message content. One set of gain-loss framed participants were told that the vaccine was effective 9 out of 10 times while the other set of gain-loss framed participants were told that the vaccine was effective 6 out of 10 times. The results showed that the message (6 out of 10 versus 9 out of 10) had *no effect* but gain-frame advantage emerged once again in encouraging behavior to become vaccinated. The researchers concluded that gain framed appeals optimize persuasiveness.

Gain and loss framing has been also used in chemical addiction cessation programs. Researchers suggested that gain-framed messaging (benefits of quitting emphasized) would be more persuasive in encouraging smokers to quit their addiction than loss-framed (costs of continuing to smoke) messages. To test this, Toll et al (2007) randomly assigned 258 participants in a clinical trial of gain and loss-framed conditions where they received video, printed messages, and written letters, all written in the particular framing. After seven weeks, the proportion of smokers who remained abstinent was significantly higher of the participants who were in a gain-framed condition as compared to the loss-framed condition. These type of effects are not limited to health promotion but to other types of behavior such as consumer behavior.

*Framing effects on consumer behavior*

Gamliel and Herstein (2007) have noticed the predominant advertising campaigning used by mass merchandisers is gain-framed messaging. Questioning the effectiveness, the Gamliel and Herstein noted that retailers

should be using loss framing because the outcome of not buying their brand is ambiguous (which follows the theory of gain and loss framing effects). They conducted an experiment on private brand purchasing (e.g. generic grocery brand such as Great Value from Wal-Mart) relative to national brands (e.g. national name brand such as Kellogs) in two contexts: positive frames ("save" on purchasing) and negative frames ("loss" on purchasing).

Five hundred participants were asked the following question: "Assuming the price of the private brand is $2.90 for a 1 liter package, would you be willing to lose $.90 and pay $3.80 for 1 liter package of that National Brand product?" or "Assuming the price of the National Brand is $3.80 for a 1 liter package, would you be willing to gain $.90 and pay $2.90 for a 1 liter package of the private brand?" Participants' were more likely to buy private brands in the loss framework than those in the gain framework; that is, they would lose money if they did not buy this product. This research is consistent with the subjective nature of framework: when the outcome of not doing the task presented is ambiguous, loss framework is more effective. These types of effects are related to the results seen in gain-framed and loss-framed relationships.

*Framing effects in relationships*

Relationship processing research indicates positive mindsets are beneficial to relationships, and researchers have questioned the extension of benefits of gain and loss framed messaging. Berger and Janoff-Bulman (2006), building from the Clark and Grote's model (1998), explored the relationship between appreciation of the partner and how chores were viewed. The

researchers took three groups of people: low satisfaction in relationship (the loss framed group), medium satisfaction, and high satisfaction (the gain framed group). After placing them in their group using a marital satisfaction survey, the couples were administered two additional surveys regarding how many chores and favors they did for their significant other and how much they enjoyed doing these task. The results of the study were parallel to that of gain-framed context. The "costs" of a relationship, as the researchers called them, such as doing favors for a spouse (washing their clothes, cleaning their mess), are all dependent on the frame of the relationship. The costs of the relationship were more pleasant, "less obligatory," less routine and mundane, and more enjoyable when they were gain framed (high relationship appreciation). Conversely, the cost of relationship was negatively influencing the individual in loss-framed relationships (low appreciation). Researchers showed that even the routine tasks became "positive investments" in the gain framed context. Interestingly, the partner's appreciation for these mundane tasks was a basis for regarding these chores, etc. as investments or inputs for the relationship – not as tasks.

*Framing effects in gambling*

Gain and loss framing can also affect gambling behavior. Thaler and Johnson (1990) note that individuals who win after the first gamble automatically enter in the gain-frame and those individuals who lose after the first attempt automatically fall into the loss-frame. They have labeled the subsequent choices that follow the first game as the House Money Effect. The House Money Effect notes that in prior gains players are more likely to accept future gambles;

however in the loss frame (where participants have already lost) participants are less likely to take risks unless they are given the opportunity to break even. The House Money Effect happens because the gamblers in the gain frame claim they are "playing with the house money."

To demonstrate this effect, Thaler and Johnson simulated the gambling choices. Each choice was presented with a prior gain or loss frame ("You have won/lost X dollars, now chose between gamble A or sure outcome B). Following the gain, 77% of the subjects were risk seeking (meaning they chose to gamble instead of the sure outcome) when they were in the gain framework. Researchers concluded that it was due to the framing of the context that caused the behavioral differences.

Gain-framing consistently demonstrates positive outcomes from the domains discussed. Additionally, gain and loss-framed message effects have been researched in other domains such as personality (Levin, et al, 2002) and surgical decision making (McNeil, 1982). However, many researchers have wondered if the response to gain and loss framed messaging is strictly behavioral or if it has cognitive groundwork.

*Framing Effects on Cognitive Processes*

Bechara, Damasio, and Damasio (2000) discovered that different parts of the brain are engaged in decision-making depending on the frameset. To examine how this works, Gonzalez, Dana, Koshino, and Just (2005) theorized that framing effects are a direct result of the tradeoff between the cost of the stimulus in the alternatives (the more costly, the less likely people chose the

option) and the "affective value" of the alternatives (the more discomfort felt, the less likely people chose the option).

In order to understand this framework, researchers followed the work of Payne and his colleagues who proposed the Cost-Benefit Tradeoff Theory. Payne et al, (1993) proposed that choice is simply a "compromise between the desire to make the correct decision and the desire to minimize effort." In essence, individuals begin the decision-making process by devising a list of all the possible alternatives and seeing which decision can expend the minimal amount of cognitive effort. If the person cannot find a good alternative through a simple alternative, then the individual will commit to a more complicated cognitive effort.

More specifically in a gain frame, individuals strive to have to make fewer compromises and make decisions with as little cognitive ability as possible. For example, when given a scenario where the participant can save 200 lives, the decision is easy because there is no cost associated (the decision is effortless) and the participant "feels" affectively good in what they are doing. Even if the scenario is risky (for example, the participant has the possibility of becoming injured but will clearly save hundreds of lives), the participant will still feel affectively good and thus follow through on the scenario.

Conversely, if the situation changes to a loss frame, the cognitive processes alter. When a participant is told 400 will die, the participant engages more cognitive processes as measured by fMRI to decide on how he or she will behave because they are intent on altering the outcome. As a result of the

cognitive engagements, participants have been shown to take significantly longer time in making decisions when the message is framed in losses than gain (Payne, et. all, 1993; Glimcher, 2003).

In addition, fMRI studies have shown that gain and loss-framed decision-making involves the prefrontal cortex. The prefrontal cortex is associated with decision-making in affective processes and in risk assessment. Gray, Braver, and Raichle (2002) proposed that in gain and loss-framed decisions the prefrontal cortex is more engaged, especially during loss-framed messages because there were more feelings of displeasure than with the gain frame. To test this idea, Paulus et al (2001) gave fifteen college students a fMRI during 10 different scenarios using the different framing techniques in regards the Asian disease problem: "Imagine that the United States is preparing for an outbreak of an unusual Asian disease that is expected to kill 600 people." The gain-framed message said that the program would save 200 people while loss-framed message was that the program would kill 400 people. Both frames were paired with probability statistics. The researchers were interested in which option they would chose and their reaction time. The results confirmed most of what the researchers predicted: participants chose the gain-frame significantly more than the loss frame, and it took more time for participants to make decisions when there two options were both in loss frames. Additionally, the fMRI revealed that there was significantly cognitive effort expended in loss frames than gain frames by the activation in the prefrontal and parietal cortices of the brain.

Despite the behavioral changes and cognitive processes, some are suspicious of the effects of gain and loss-framed messages, claiming that descriptors used cause participants to respond to the tone of the message, which causes the cognitive and behavioral reaction.

*Power of Descriptors*

The way a message is communicated using distinctly different terminology has been a concern of many researchers (see Dilllard & Marshall, 2003; Rothman & Salovey, 1997; Wilson et al, 1988). This has been called the effect of "descriptor" (Tversky & Kaheman, 1981) or the "kernel phrase" (O'Keefe & Jenson, 2007). Using the gain-frame experiment with the Asian disease problem as an example, the gain-framed outcome was framed positively with positive descriptors: "If Program A is adopted, exactly 200 people will be saved." Researchers noted that perhaps they should have worded it as the following: "If Program A is chosen, 200 people will not die" (Levin, Schneider, & Gaeth, 1998). Similarly, in the loss frame, Program B could be redesigned to say, "400 will not be saved." This is called "simple negation versus alternative terminology" and should be considered when exploring the effects of gain-loss framing.

To determine the effect of the terminology, the vaccination study was replicated to show differences between the "descriptor formulations," ensuring participants were not responding to the tone of the study. In the experiment, the descriptor formulation was "saving" and "not saving" (versus "dying") and the outcome formulation is "losing" and "not losing" (versus "living"). The results

replicated the original experiment. Gain framing was still more effective than loss framing regardless of tone (Levin, Schnedier & Gaeth, 1998).

Researchers have repeated experiments to ensure that tone was not the reason for the behavioral change. Latimer, Salovey, and Rothman (2007) point out that how the gain and loss framing messages are worded are not nearly as important as in what domain the framed messages are placed. They conclude further research to tone of the message is not necessary. However, they note that research regarding framed messaging in other domains should continue. One of the domains in which gain and loss-framed messages has not yet been researched is training.

A conceptual model of the study

While researchers have established that training assignment may have detrimental effects, it has yet to be shown how framed messages during the training affect the way a trainee absorbs the information and perhaps more importantly, how framed messages may actually enhance or inhibit the effects of training assignment. Quinones (1995) has demonstrated that assignment to remedial training has negative outcomes such as self-efficacy, fairness perceptions, and even training outcomes such as learning and behavior. This study extended Quinones' work to examine the effects of framed messages during training.

Health educators have used framed message to change behaviors, and they view framed messaging as a driving force for changing behavior. Trainers are unsure about how these messages will affect a non-threatening life episode

such as training. Given that framed messages have been shown to affect other domains that involve non-life altering decisions such as economic decision making, gambling, and relationship perspectives, perhaps the effect of framed messages do indeed have potential to change behavior and perceptions in training domains.

In the present study, the researcher assumed the effects of training assignment are clear and that advanced training participants have a clear advantage in several areas. Therefore, as demonstrated in the Figure 2 that follows, all participants were assigned to remedial training to establish the effects of gain and loss framed messages. Participants were randomly assigned to gain or loss framed training conditions to evaluate the impact of these messages on outcomes. The model proposed that gain and loss framed messages would have the most immediate effect on self-efficacy, fairness perceptions, and motivation to perform. These results in turn would affect both affective and performance outcomes. Trainees' level of self-efficacy would be dependent on each individuals' own perceptions of their ideal and actual selves. The effect of gain-framed training was hypothesized to remove the negative outcomes that are commonly associated with remedial training experienced in the Quinones study.

In keeping with current research, the experimenter carefully removed two important framing influences: (1) the distinction between promotion and prevention and (2) the influence of descriptors. First, many health-related studies made the distinction between promotion and prevention such as the sunscreen study. However, while the effect differences between promotion and prevention

are significant, the effects are small and, more importantly, limited to studies in health promotion. Secondly, because this study attempted to look at decision-making that will not influence physical health in any direct way, the distinction between promotion and prevention was not considered in this study. Additionally, descriptors, as noted previously, have been a concern of some researchers in framed message. However, as noted by Latimer, Salovey, and Rothman (2007), descriptors should not be considered and thus not considered in this study.

Finally, O'Keefe & Jenson (2007) have argued in which direction a particular framing may change behavior. The results of gain and loss-framed messaging have dramatically different outcomes depending on the context as found in the mammogram experiment (Banks et al, 1995) compared to the mouthwash experiment (Rothman et al, 1999). In certain contexts like the mouthwash experiment, gain framing has the upper hand in promoting positive behavioral change, and in other contexts like the mammogram experiment, loss framing has the advantage. Researchers have theorized that when outcomes are more tangible (for example, saving 9 lives, reducing plaque by 74%), gain framing has a clear advantage and when outcomes are vague (for example, discovering a disease, "may" save lives, etc), loss framing has the advantage. Therefore, because this study employed various means of somewhat tangible outcomes, gain-framed messaging was hypothesized to have the advantage.

With these principles in mind, the study explored the outcomes of message-framing during remedial training. Researchers have determined that

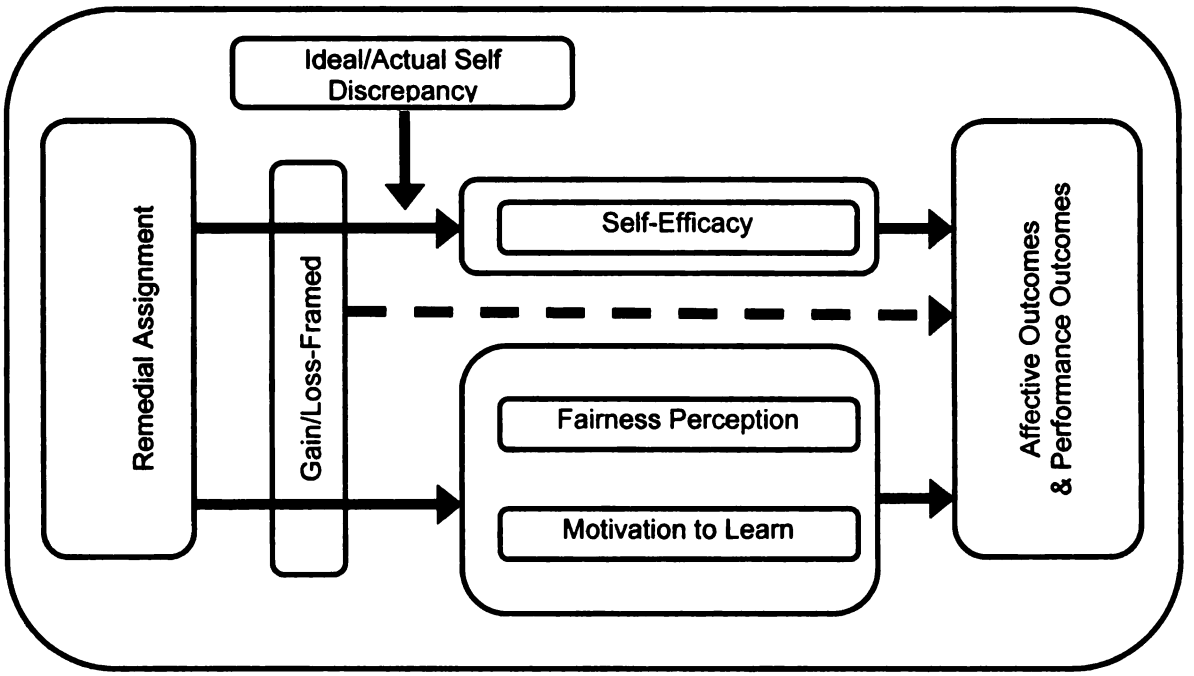



Figure 2. A Conceptual Model of the Current Study. *Remedial training participants are placed into gain framed training, which will in turn affect self-efficacy, fairness perceptions, and motivation to learn. These variables may affect outcomes.*

remedial training has a "cycle" that needs to be broken: participants enter with lowered motivation to learn and lowered other training variables, which then may lead to lowered training outcomes. These negative outcomes defeat the purpose of remedial training. Therefore, the experimenter proposed that after the participant enters the remedial training, framed-message training might break the cycle of remedial training. To test this idea, participants randomly were assigned one of two training conditions: gain or loss. After completing their training, participants were assessed on self-efficacy, fairness perceptions, and motivation to learn. Because of the effects demonstrated by Higgins (1987), how actual/ideal discrepant individuals interacted with self-efficacy was tested. Finally, the participants were tested on training outcomes and affective

outcomes. Figure 1 below is a graphical representation of the information presented above. From these principles, the following section presents the current study's hypotheses.

*Hypotheses*

Because the effects of training assignment have been demonstrated, hypotheses were formulated based off individual questions to test the effect of gain and loss framing during the training. These hypotheses included mediating factors that may come into play during the training.

Self-Efficacy

Self-efficacy, the judgment of "one's capability to organize and execute the courses of action require to produce given attainments" (Bandura, 1997), has continuously played a role in the area of training whether it be in computer training (Martocchio & Webster, 1992), interpersonal skills (Gist, Stevens, & Bavetta, 1992), or, as in Quinones' study, training assignment (1995). Individuals who were placed in the advanced training showed higher levels of self-efficacy compared against remedial group individuals attributing their success to innate ability. In contrast, for participants who thought ability had no role in their performance, individuals in the advanced group had lower self-efficacy than those in the remedial group. These findings confirm that training assignment does indeed have an impact on self-efficacy. When training assignment power combines with gain/loss framed training, the effects are not clear.

In a study that may shed some clarity, Krueger and Dickson (1994) recorded self-efficacy levels when placed in negative and positive feedback situations. They found similar results to Quinones, who found that self-efficacy was lower in the negative feedback situation. However, when participants were then placed in situations with gain and loss gambling situations for an additional gambling trial, participants' lowered self-efficacy received from negative feedback was enhanced by threat of losses (loss framing). Loss-framed messages further degraded the self-efficacy of the individual. Based off this type of study, self-efficacy may be related to gain and loss-framed messages in training. Gain/loss-framed messages may increase the power of the indirect feedback that the participants receive. Therefore, when a participant receives gain-framed training in remedial assignment, the trainee may experience higher self-efficacy than those participants in the loss-framed training.

*Q1: Can gain and loss-framed messaging elevate self-efficacy in a remedial training assignment?*

*H1: Gain and loss-framed training will affect participants reported self-efficacy. Participants in gain-framed training condition will report higher self-efficacy than those participants placed in the loss-framed training condition.*

Motivation to Learn

Previous research has determined that training motivation – that is, a participants personal desire to learn the skill or knowledge – affects training outcomes (Colquitt, LePine, & Noe, 2000). While participants are able to master

the concepts being taught, the failure of the participants to transfer the knowledge may ultimately lie in their lack of motivation to learn. Multiple studies have verified that higher motivation is directly related to higher knowledge transfer (Mathieu, Martineau, & Tannenbaum, 1993; Facteau, Dobbins, Russel, Ladd, & Kudishc, 1995). In research related to sports activities, Kincey, Amir, Gillespie and Carleton (2006) found that motivation to learn a sports routine was linked to sports performance. Additionally, in Quinones' study (1995), he found that motivation had a significant relationship to self-efficacy as a training outcome especially for individuals in the remedial training. While motivation has been demonstrated in the role of training assignment, framed messages have yet to be understood.

The goal of framed messages is to promote a behavioral change. This has been repeatedly demonstrated in research with health promotion as demonstrated previously. However, as noted by Rothman and Salovey (1997), the particular way the framing motivates the behavior is directly dependent on the context of the desired behavior (health promotion versus relationship contexts). Very few studies have looked specifically at the motivation behind the behavioral change. However, Wilson, Wallston, and King (2006) demonstrated this interesting effect in their research on motivation to quit smoking. Participants in their research demonstrated that the threat of losing a positive reward resulted in more motivational change attitudes than gain-framed messages. Wilson, Wallston, and King suggested that in certain contexts, like health, loss-framed messages might be more effective for promoting motivational behaviors.

Consequently, the targeted gain and loss-framed messages may also cause variations in motivation to learn.

*Q1: Does gain and loss-framed messaging improve motivation to learn in remedial training?*

*H2: Motivation to learn will vary by framing condition. Those participants who are placed in the loss-framed training condition will have lower motivation to learn the Naval simulation task than those individuals in the gain-framed training condition.*

Ideal/Actual Self

Researchers have discovered that there is a difference between the individual's perceptions of the actual self and the ideal self (Higgins, 1982). The idea of the actual ideal self has been related to low self esteem when an individual views their own characteristics are different from their ideal self (mostly in the negative direction where the real self was below the ideal self). Therefore, those who have discrepancies (referred to as "discrepant person" in the literature) are motivated by anything that will help them achieve the ideal self. As it relates to the current literature on framing, Higgins and Tykocinski (1992) discovered that actual ideal discrepant persons are more "attentive" to messages that have loss-type, negative outcomes compared against gain-framed, positive messages. After using a gain and loss framed instruction on breakfast consumption, further research by Tykocinski, Higgins, and Chaiken (1994), has found that these discrepant individuals who read a gain-framed message (which is type of message used in the Naval training) would actually engage the

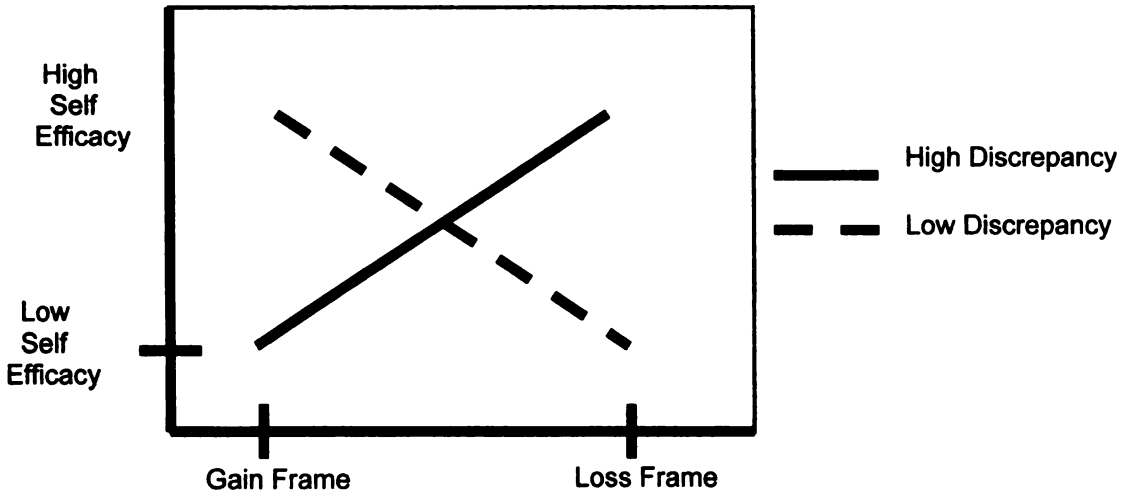



Figure 3. Proposed Interaction of Ideal/Actual Discrepancy with Self-Efficacy and Framing

individuals low self-esteem, causing a rejection of the gain-framed messages. Conversely, person with a self-esteem was more receptive and responsive to a loss-framed message. Translating this into the relationship with self-efficacy and its impact on the results of the gain/loss-framed training, researchers have found close ties to self-efficacy. In fact, some researchers have suggested that the differences among self-esteem and self-efficacy are "psychologically meaningless" (Meehl, 1990) or "ambient noise" (Lykken, 1968) and "quite small in magnitude" (Judge, Erez, Bono, & Thoreson, 2002). Additionally, discrepant individual research has shown strong ties to self-efficacy (Eiser, Cotter, Oades, Seamark, & Smith, 1999).

In accordance to these findings, this study assessed the individual's ideal/actual discrepancies. As shown on Figure 3, high discrepant individuals will act in the opposite direction of the proposed self-efficacy hypotheses.

*Q3: Do individual differences in ideal/actual self-discrepancies interact with the power of the gain and loss-framed messages?*

*H3: The effects of gain and loss-framed training on self-efficacy will vary depending on the level of ideal/actual self-discrepancy. High discrepant individuals in the loss-framed message will respond to loss-framed messages, leading to higher self-efficacy compared to the gain-framed individuals. Low discrepant individuals will have lower self-efficacy in the loss-framed message training compared to individuals in the gain-framed message training.*

Fairness Perceptions

The issue of fairness is related to motivation to learn. Researchers have suggested that perceptions of fairness can relate to commitment to the task and motivation to learn (see Folger & Konovsky, 1989; Fryxell & Gordon, 1989). Training assignment is a source of fairness feedback, which has been shown to affect motivation levels. Quinones (1995) found that participants who believed they should have been placed in the advanced training and were placed in remedial training showed significantly lower levels of fairness compared to those who were placed in the advanced group. Similarly, those individuals who thought they did poorly but were placed in advanced training showed high fairness perceptions.

No published studies have strictly looked at fairness perceptions in gain and loss-framed messages. However, Liberman, Idson, and Higgins (2005) noted that in contexts such as negotiations, participants would perceive loss-framed messages as "intensely negative," and DeDreu (1996) concluded that framing outcomes in a gain-framed context creates a stronger concern for distributive justice when paired against losses in the context of co-worker equality. Utilizing the results of these studies and given framing message cues of benefits versus cost, participants may experience less negative fairness perceptions when given gain-framed training compared to loss-framed training.

*Q4: Does gain and loss-framed messaging influence pre-existing the negative fairness perceptions received from remedial training?*

*H4a: Perceptions of fairness will be related to framed-messages. Participants placed in gain framing will have a higher perception of fairness perceptions (both distributive and procedural justice) to remedial training assignment than those participants in the loss framed training condition.*

Training Outcomes & Training Reactions

Training outcomes are tangible behaviors that occur due to the training intervention. Training effectiveness and outcomes have been measured in several different ways: reactions to the training, length of retention, behavioral changes, and results on a task (Kirkpatrick, 1960). Training outcomes will vary based on framed messages. In this study, both affective and performance

outcomes were measured. In regards to affective outcomes, reactions to training in the gain framed-training will be seen as more positive as it was seen in the smoking cessations experiment (see Toll et al, 2007). For performance outcomes, there is little literature to suggest how framing will affect speed, accuracy, learning, and behavior after a training session. However, based off the research by Paulus (2001), gain-framed messages facilitate quicker decision-making. Therefore, in regards to speed, gain-framed messages may help participants make quicker decisions. Additionally, gain-framed messages in tangible-outcome behavioral studies have been more effective in changing behavioral compared to loss-framed messages (Toll et al, 2007). Therefore, in regards to learning and behavior, gain-framed messages may help participants learn the information and respond with the appropriate behavior. However, for accuracy, no studies specifically test "accurate" decision making when placed in differently framed messages.

*Q5: Do gain and loss-framed messages influence training outcomes such as speed, accuracy, learning, and behavior?*

*H5a: Framing will be related to speed and accuracy. Participants in gain-framed training will have higher speed and accuracy compared to participants in loss-framed training.*

*H5b: Framing will be related to learning. Participants in gain-framed training will have higher learning scores over loss-framed training.*

*H6: Participants will view gain-framed training more positively than those in loss-framed training.*

Mediating Hypotheses

Organizational psychologists have recognized the role of mediating effects in work behaviors (James & Brett, 1984). Mediating effects explain, "how external physical events take on internal psychological significance" (Baron & Kenny, 1986). When it comes to framing effects, research on the mediating effects is thin. However, an emerging amount of research has looked at mediating effects of certain variables on training outcomes.

One of the more popular areas is self-efficacy and the relationship to training outcomes (Frayne & Latham, 1987; Gist, 1989). However, previous research has not yet tested the mediated effects of self-efficacy on the relationship between training outcomes and gain/loss-framed messages. In such way, it was hypothesized that self-efficacy may be a strong predictor of training success as demonstrated by Gist, Schwoere, and Rosen (1989) and Martocchio and Webster (1992). However, gain and loss-framed training may activate or elevate the person's self-efficacy. This type of hypothesis is linked to the research by Gomersall and Myers (1966) who demonstrated that a successful training intervention was due completely because it elevated participants self-efficacy.

*Q7: Does self-efficacy mediate the relationship to successful training outcomes?*

*H7a: Self-efficacy is hypothesized to mediate the relationship between gain/loss-framed messages and behavioral outcomes.*

*H7b: Self-efficacy is hypothesized to mediate the relationship between gain/loss-framed messages and performance outcomes (speed and accuracy).*

*H7c: Self-efficacy is hypothesized to mediate the relationship between gain/loss-framed messages and learning outcomes.*

Another mediating factor hypothesized to effect training outcomes is motivation. Quinones found many correlational relationships between motivation and accuracy, behavior, and learning outcomes (1995). More importantly, researchers have begun to uncover the mediated effects of motivation for accomplishment. Barrick, Stewart, and Piotrowski (2002) found that motivation mediated the relationship between personality and job performance in sales associates. This type of mediated model was hypothesized to predict training outcomes with gain/loss-framed training.

*Q8: Does motivation to learn mediate the relationship to successful training outcomes?*

*H8a: Motivation is hypothesized to mediate the relationship between gain/loss-framed messages and behavioral outcomes.*

*H8b: Motivation is hypothesized to mediate the relationship between gain/loss-framed messages and performance outcomes (speed and accuracy).*

*H8c: Motivation is hypothesized to mediate the relationship between gain/loss-framed messages and learning outcomes.*

Finally, the model hypothesizes that fairness perceptions may mediate effects for gain/loss-framed messages. Again, Quinones found significant correlational relationships between fairness perceptions and training outcomes (1995). Similarly, Pillai, Schriesheim, and Williams (1999) found that fairness perceptions mediated the relationship between transformational leadership and organizational citizenship behaviors. This type of mediating effect was predicted to effect gain/loss-framed training outcomes.

*Q7: Do fairness perceptions mediate the relationship to successful training outcomes?*

*H9a: The perception of fairness is hypothesized to mediate the relationship between gain/loss-framed messages and behavioral outcomes.*

*H9b: The perception of fairness is hypothesized to mediate the relationship between gain/loss-framed messages and performance outcomes (speed and accuracy).*

*H9c: The perception of fairness is hypothesized to mediate the relationship between gain/loss-framed messages and learning outcomes.*

Additional Exploratory Evaluations

In addition to the variables mentioned in the hypothesis, the researcher measured other variables related to gain and loss-framing: mood orientation and personality.

Kaheman (2003) and Schwartz (2002) noted that affect may be an important part of the decision making process. Williams and Voon (1999) and Shiomura and Atsumi (2001) also noted that mood affects the way individuals process information. For example, positive mood increases "cognitive flexibility" and expanded reasoning (Isen, 2000). Conversely, Schwarz (2002) discovered that negative mood leads to increased attention and expanded cognitive resources for processing information. Additionally, negative mood relates to decision-making. For example, when a person experiences a negative mood, that individual is more likely to overestimate the likelihood of the chances of a future negative event and underestimate the chances of a future positive event (Nyren, Isen, Taylor, & Dulin, 1996). For example as Nygren (1998), individuals given a gambling decision in a positive mood can lead those who typically are low risk individuals to make higher risk decisions.

In addition to altering decisions, Pinon and Garling (2004) note that framing may alter mood. Gain framing implies a positive mood, and loss framing implies a negative mood. For example, a gain frame would increase risk aversion in gambling behaviors because of mood elevation. Thus, this study examined the impact of mood by assessing if mood changed after the framed

training intervention because an individual's mood may enhance or inhibit a person's receptiveness to the gain or loss framing.

*Personality*

Levin, Gaeth, & Lauirola (2002) studied the relation of personality traits to framing. They found that framing effects have been correlated with personality traits as classified in the Big Five Inventory. Individuals who scored high on Neuroticism, low on Openness, high on Conscientiousness, and low on Agreeableness were more likely to have a propensity towards large risk choice framing, such as choices made with big-stake gambling. Additionally, individuals who are higher in Conscientiousness are more likely to respond to loss-framed messages (Levin, et al, 2002). That is, loss-framed messages appear to have stronger effects on individuals high on conscientiousness as compared to those who are low in conscientiousness .

In addition to these direct effects, certain features of personality may be linked to mood as well. Rusting (1998) found that personality traits are correlated with certain trait-like moods. Based on his meta-analysis, neuroticism, extraversion, and agreeableness were related to mood states. Therefore, Pinon and Garling (2004) argue that the effects of personality on framing may be mediated by mood. Because of these important findings, this study examines the role of personality on framing. Individuals who are high on particular personality qualities such as consciousness or agreeableness may respond to the gain and

loss framing in different ways, which may be seen by looking at the relationship of training outcomes and personality variables.

# METHODS

## Participants

Participants were undergraduate students at a large Midwestern university. The participants received introductory psychology credit for participating in the research study. The study originally had 227 participants. However, 41 participants were dropped because they failed to complete both parts of the experiment. Of the 186 participants (46.2% male; 53.8% female), 47.6% were Caucasian/White, 9.9% were Hispanic/Latino, 15.6% were Asian/Pacific Islander, 16.7% were Black/African American, and 18.7% identified as other. The average age of participants was 20.59 (*SD* = 2.79).

## Design

The study used a one-way experimental design using two (2) levels of a between subjects variable. The manipulated variable was the framed message training to which the participant was randomly assigned that is gain or loss-framed training.

## Task

The focus of this study assessed subsequent attitudes and performance outcomes by framed messages in training. To assess these outcomes, the experimenter used the Quinones task. Quinones identified three necessary properties to mimic real-world situations: (1) participants must have limited prior knowledge of the task; otherwise it would create a ceiling effect, (2) the task must be difficult enough to allow for variation in performance outcomes, and finally (3)

the task must be complex enough to ensure the participant is paying attention to the task and training.

The experimenter chose the multiple-cue-learning task that requires that participants to make decisions in a simulation. Following the algorithm designed by the architects of the Navy simulation task, the researcher categorized the responses as correct or incorrect. Performance on the task was determined by how well the participant learned how to do the task correctly through training.

The specific multiple-cue-task was an evolved version of the Naval Air Defense simulation (Quinones, 1995) called Tandem, which has been used in testing cognitive abilities and team interactions. The original program was altered to allow participants to see five different cues to make a decision instead of two cues in the original version. In this computerized simulation, researchers asked participants to command a US Navy vessel. Participants were presented with a "radar-like" screen, which has 22 different unidentified targets. Participants chose whether or not to fire shots at targets based off cues about the target. In order to determine whether to fire shots at the target, participants had to first decide the type of aircraft they have identified: air, sub, or surface. Then, they identified the classified of each target: civilian or military. Finally, the participants classify the intent of the target: peaceful or hostile. From these decisions, the participant had to either "shoot" or "clear" the vessel. Each trial had to be completed within four minutes. The simulation tracks the amount of vessels successfully targeted (the speed of the task) as well as accuracy of the decisions.

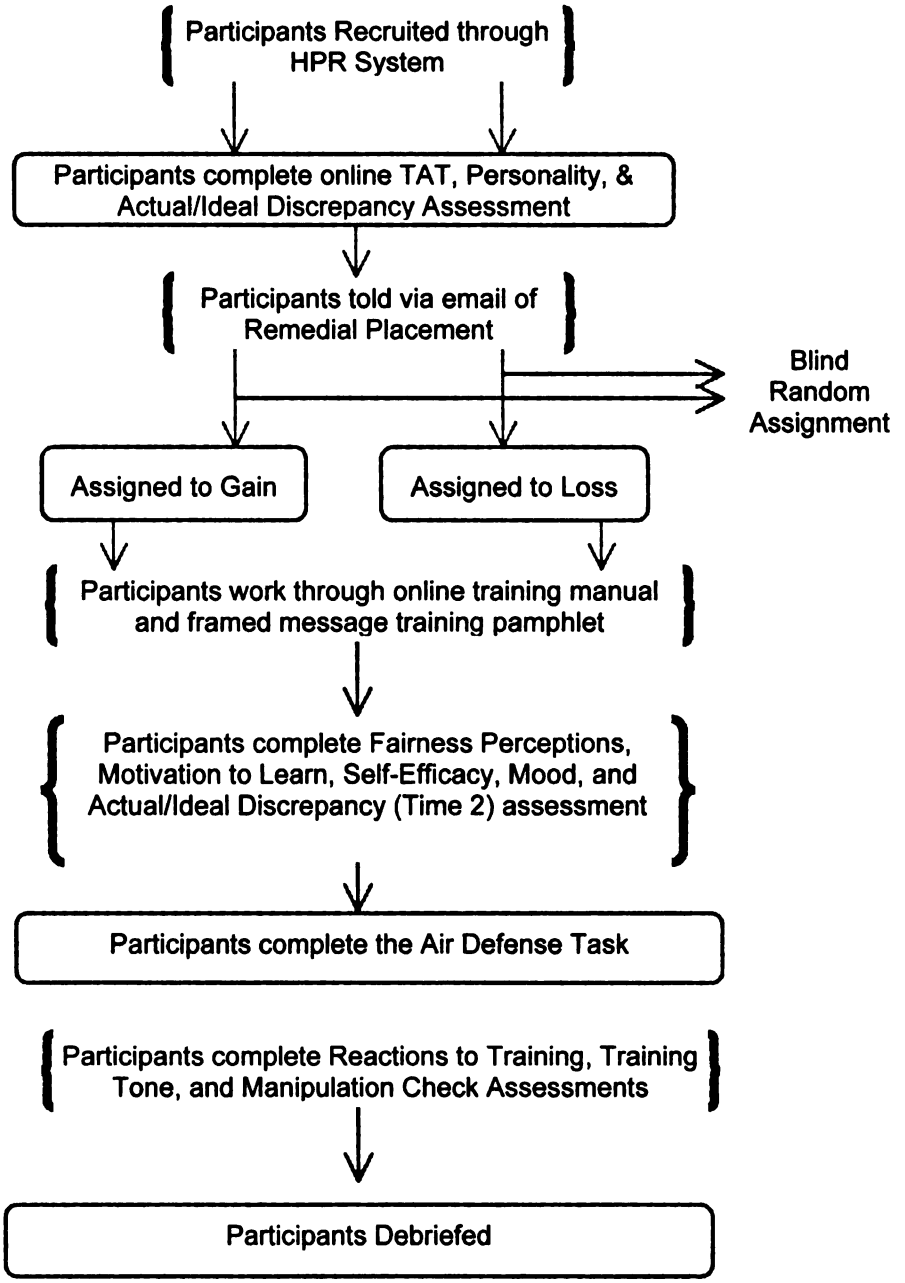



Figure 4. Representation of the Procedure

The researcher scored the outcomes of the task based on how the participants respond to each target. For each decision, if the participant made it correctly, the participant received 100 points, and for each decision that was made incorrectly, the participant lost 100 points. Participants lost points when they allowed vessels

to enter their defense perimeter, and gained points for correctly identifying "high priority" targets, those that were intensely hostile.

## Procedure

See Figure 4 for a graphical representation of the procedure. The experiment was divided into two sessions. The first session consisted of the online pre-assessment, during which the participants were told would what qualify them for either the remedial or the advanced condition. The participants were unaware that despite their performance they would be placed in the remedial training assignment. The researcher revealed their assignment via email. On the second day, which required an onsite visit to the research lab, the experimenter reviewed the assignments, and participants were placed into two different framed training conditions

At the first session, the participants read and electronically signed the consent forms informing them of the nature of the experiment – it was voluntary and the type of activities that would be administered. See Appendix A for copy of the consent form. The experimenter informed the participants that they were helping the research team determine if a particular training design was effective. The guided computer screens discussed the Air Defense Task and introduced the task. The researcher then said there were two different types of training designs they were evaluating. They were told that the performance on the pre-assessment dictated which of the designs the participant would be evaluating. The researcher told the participants that past research revealed certain individuals perform exceptionally well and others do extremely inadequately on

the pre-assessment. In addition, the researcher explained that those who performed poorly on the pre-assessment would be placed in remedial training. Those who did well on the assessment would be placed in advanced training to learn how to use the Air Defense Task in more sophisticated ways. The computer then presented the Training Assignment Test (TAT), which, as the experimenter noted, would determine which, training program they would be assigned (See Appendix B for copy of the TAT). The test included knowledge-based Naval defense questions and actual simulations used in the trials and the Actual/Ideal Discrepancy Assessment and the Personality Assessment. Participants were informed that based on their performance they would be contacted by e-mail as to which session they were to be assigned. In actuality, all participants were placed in the remedial training assignment. However, the experimenter mentioned a fake "Advanced Training" session that would occur after the Remedial Training to ensure that participants believed the manipulation.

In the second session, participants went to the experiment site in smaller groups (typically 2-6), and, they were immediately reminded of their results of the TAT. The course instruction was labeled blatantly with "REMEDIAL" and the lab room was labeled "REMEDIAL TRAINING." Participants were randomly assigned to one of two sessions: one for remedial assignment with gain framed training and one for remedial assignment with loss framed training. While the overall instruction and content was the same for both framed training courses, the way the training was instructed was framed differently depending on framing assignment, and participants were randomly selected by experimenter prior to

participant arrival of their assignment. The instruction began with an emphasis on the training goals, and the training frame was sustained throughout the training materials.

In the gain frame, remedial training orientation, participants were presented with a message:

> "You have been selected to participate in this training intervention. This training intervention will help you succeed in learning the information you will need to be successful in the simulation task. This training intervention has been specifically designed for you because you have several characteristics that show that you are still learning flight simulation mastery and may have some areas in which you may want to improve your knowledge before you engage in the task again. Additionally, you will be able to save up to nine times more lives than you did in your initial assessment! After you finish this training, you will be able to do much better than you did the last time and you will feel great about yourself."

The participants were then given the training goals packet, which can be found in Appendix D, and instructed to how to use the computer-training manual. The training manual as reproduced in Appendix C was reviewed and any type of loss-framed messages were removed such as mention of: "failure," emphasis on cutting costs, and identifying weaknesses; these phrases were replaced with neutral messages In the training manual, a special section was added on how to maintain a positive outlook even if the participant makes a mistake. While the participants were reading the manual, the instructor guided participants through

the task and how to accomplish the Naval simulation task. The instructor stated each section while the participants were encouraged to follow along with the training packets provided. During the instruction, participants learned how to use Naval Courses' Inflection points – that is, how to determine if the scenario included threatening warships or non-threatening warships. Instructors emphasized dimensions of the targets and how to determine how these attributes may interact. For example, a fast vessel going away from your ship is deemed non-threatening; but when the fast vessel is going towards you or one of your partners' vessels it is considered threatening. After participants were familiar with inflection points, they were given additional time to review the manual that contained instruction on how to use the computer program and how to utilize "hot keys" which would make the task more smooth if used appropriately. When the participant finished reading the manual and listening to the training leader, they completed a training goals worksheet, which asked them to list five positive reasons why they are completing the task.

In the loss frame, remedial training orientation, participants were greeted with the following message:

> "You have been placed in this training program. This training will keep you failing again in this task. This training program will help you maintain your ability to continue in this experiment. Additionally, if you do not absorb this information correctly you will up to kill nine times more people as you did in your pre assessment. If you do not retain the information that is

presented here, you will have a greater chance of failure in the future on this task and you may feel sad about that."

The participants were then given the training goals packet, which can be found in Appendix E and instructed to how to use the computer-training manual. The training manual was reviewed and any type of gain-framed messages were removed such as mention of: "failure," emphasis on cutting costs, and identifying strengths; these phrases were replaced with neutral messages (See Appendix D for Training Pamphlet). While the participants were reading the manual, the instructor guided participants through the task and how to accomplish the Naval simulation task. The instructor stated each section while the participants were encouraged to follow along with the training packets provided. During the instruction, participants learned how to use Naval Courses' Inflection points – that is, how to determine if the scenario included threatening warships or non-threatening warships. Instructors emphasized dimensions of the targets and how to determine how these attributes may interact. For example, a fast vessel going away from your ship is deemed non-threatening; but when the fast vessel is going towards you or one of your partners' vessels it is considered threatening. After participants were familiar with inflection points, they were given additional time to review the manual that contained instruction on how to use the computer program and how to utilize "hot keys" which would make the task more efficient and smooth if used appropriately. When the participant completed their manual and finished listening to the instruction of the training leader, they filled out a list on the top five costs of not completing the task correctly.

Before beginning the task, all participants filled out the Fairness Assessment, Self-Efficacy Assessment, Motivation to Learn Assessment, Mood Orientation Assessment, and Ideal/Actual Discrepancy Measure (Time 2). The participants then worked on their task. Each participant was allotted 20 minutes to complete the Air Defense Task. The participants knew they were being rated on both speed and accuracy of their task performance.

At the end of the task, participants completed the Knowledge Assessment (Training Assessment Task), Training Reactions Assessment, Training Tone Assessment, and Manipulation Check Assessment. Finally, participants were debriefed and told the details of the study. The experimenter emphasized that the training assignment was random and had no actual reflection on their overall performance on the TAT. The experimenter asked all participants not to discuss this experiment with anyone until the experiment had concluded, as not to create in bias in the experimental data.

## MEASURES

The measures are listed in accordance to when the participant completed the assessment (n = 186). Results of these statistics are described in detail in the "Results" section.

### Learning Assessment/Training Assessment Test

The Training Assessment Task included a 20-item knowledge test anchored in 20 five-option multiple-choice questions, where the participant was asked about the combination rules for the task simulation. Participants were also presented with nine targets and asked to give the appropriate response. The

same assessment was used after the Navy simulation to serve as a basis of pre and post knowledge assessment. In Quinones's study, he found the test to have a split half reliability of $r$ = .70. The reliability of this study is $r$ =.76. A copy of this measure is found in Appendix B.

Actual/Ideal Discrepancy

Because of the criticized complexity of the original measure (Tangney et al., 1998), the current study used a shortened version of Higgins' original ideal/actual discrepancy survey (Higgins, Klein & Strauman, 1985). Hardin (1987)'s shortened version of Higgin's original questionnaire asked participants to identify up to 5 attributes for their (1) actual self and (2) ideal self. After which, the participants were asked to rate from 1 to 5 the extent at which each attribute actually applies (lower combined scores indicated a greater cohesion of the self and less discrepancies with the self states). Scores ranged from 5 (no discrepancy) to 25 (highest degree of discrimination) In a study utilizing this measure, the reliability was $\alpha$ = .85. Additionally, Leonardelli, Lakin, Lynch, and Arkin (2003) tested specific predictions of Higgin's self-discrepant theory utilizing this measure and found strong evidence of the validity of this measure. The observed reliability of this study was $\alpha$ = .79 for Time 1 and $\alpha$ = .72 for Time 2. A copy of the measure can be found in Appendix I.

Fairness Perceptions (measured by Distributive and Procedural Justice)

A twenty-item scale was used to assess the participants' perceptions of fairness regarding training assignment. Both procedural (10 items) and distributive (10 items) justice were assessed using a modified version of

Hattrup's justice measure (1992). Participants rated themselves one to five on how well the agreed with the statements. The resulting reliabilities found in the Quinones study were $\alpha$ = .92 and $\alpha$ = .83, for distributive and procedural justice, respectively.

Exploratory factor analyses revealed the presence of three distinct factors in the two justice measures. The presence of a third factor indicated that there were questions that did not distinctly load to distributive justice or procedural justice. Only two questions loaded onto the third component. When the two questions were discarded, internal consistencies for the two justice measured increased from $\alpha$ = .82 to $\alpha$ = .87 for procedural justice and $\alpha$ = .83 to $\alpha$ = .89 for distributive justice. However, after re-running the correlative data analyses, the withdrawal of the two questions had no significant impact on the outcomes, and therefore, the two questions were retained in the original fairness perceptions measurement. The observed reliability of this study was $\alpha$ = .82 and $\alpha$ = .83, for distributive and procedural justice, respectively. A copy of the measure can be found in Appendix F.

Self-Efficacy

Quinones' pre-training self-efficacy test which was adapted from Hattrup's original test (1992) determined a person's expectation regarding their future performance on the Training Assessment Test.. Anchored in a five point likert scale, ten questions were asked. Quinones' observed reliability was $\alpha$ = .90. The observed reliability was $\alpha$ = .89. A copy of this measure can be found in Appendix G.

Motivation to Learn

Modeled after Noe and Schmitt (1986), the participant's motivation to learn was measured using a ten-item scale. Anchored in a five point likert scale, participants reviewed the questions and indicated their level of agreement with each item. The observed reliability for Quinones was $\alpha$ = .93. This study's observed reliability was $\alpha$ = .89. A copy of this measure can be found in Appendix H.

Number of Trials (Speed)

In order to assess the number of trials the participant completed during their 20-minute simulation, we accessed the records from the computer. There were 22 targets per scenario (4 scenarios) in the simulation. The more targets acquired the better the performance.

Accuracy

The point system described earlier was used to assess the participant's accuracy during the computer simulation. Points ranged from +100 to -100 for each of the trials and the scores were directly related to how close the participant was to the correct response.

Reactions to Training

Reactions to the quality and usefulness of the training was assessed using the same 10 item scale that was developed by Quinones (1995), which demonstrated the utility judgments that underlie training assessments. Anchored in a five point likert scale, participants simply answered with their agreement to

each statement. The observed reliability of Quinones' study was $\alpha$ = .80. The current study's observed reliability was $\alpha$ = .90. A copy of this measure is found in Appendix L.

Training Impressions Check

After the verbal messages were given and the manual was read, all participants completed a post-intervention questionnaire, which evaluated the different aspects of the messages received during the training and in the training manual. First, using a 5-point scale, the training program was rated how (1) believable, (2) interesting, and (3) confusing the training was. Second, participants were asked to rate their overall impressions of the tone of the experiment by rating the tone from one (extremely negative) to five (extremely positive) (Toll, O'Malley, & Katulak, 2007). A copy of this measure is found in Appendix M.

Manipulation Check

As used in previous gain-framed loss manipulation checks (see Toll, O'Malley & Katalak, 2007), the post-questionnaire asked participants to rate how heavily the training focused on the benefits or the costs of doing well in the training program from 1 (*It focused heavily on the benefits of completing the task successfully*) to 5 (*It focused heavily on the costs of failing at the task*). Next, participants identified what training assignment group in which they were placed: advanced or remedial. A copy of this measure is found in Appendix N.

Mood Orientation

The basic moods as described by Ekman, Levenson, & Freisen (1983) are happiness, anger, fear, sadness, and surprise. These states can be captured in the Brief Mood Introspection Scale (Mayer & Gaschke, 1988). The BMIS has a reported reliability of 0.76 to 0.83. Muraven, Tice, and & Baumeister (1998) reported the BMIS as an acceptable measure of mood. As recommended, the response scales were altered from 4 steps to 7 steps with anchors spaced 2 steps apart. In such a way, reliability increased when the range increased (Nunnally, 1967). The current study's observed reliability was $\alpha$ = .81. A copy of the measure is found in Appendix J.

Personality

Researchers have assessed the Big Five Personality Inventory in multiple ways since the first personality instrument developed in 1917 by Woodworth. Because other measures are considered "narrow" in their ability to test personality, this study utilized the International Personality Item Pool (Goldberg, 1999). The resulting reliabilities of the scale reported by Buchanan, Goldberg, and Johnson (1999) were $\alpha$ = .74, .84, .88, .76, and .83 for openness, conscientiousness, extraversion, agreeableness, and neuroticism, respectively. The current study's resulting reliabilities were $\alpha$ = .76, .74, .85, .80, and .86. A copy of the measure is found in Appendix K.

## Analytic Strategy

The analytic strategy for this study was modeled on the causal relationship presented in the introduction. Individuals in the both conditions (gain and loss) were used for the analysis (n = 186).

The first set of analyses compared descriptive data of gain and loss framing messages on the following variables: self-efficacy, motivation to learn, fairness perceptions, and training outcomes. Even though the effects of framing were hypothesized to be mediated by these variables, these analyses allowed for the exploration of any overall main effects that framing might have on training outcomes. Additional analyses of demographic covariates were not run because none of the demographics had a significant effect on any of the outcome variables.

During the first set of analyses, the researcher ensured reliabilities were appropriate to continue analyses of relationships. If any of the analyses revealed sub-standard reliabilities, the researcher examined the scale for validity. Additionally, the researcher performed an exploratory factor analysis on fairness perceptions to ensure that the modified scale retained two distinct measures of fairness.

The study's second set of analyses, correlations, calculated associations between all the variables measured in the study. Participants in the gain-framed training were coded as 1 and participants in the loss framed training were coded as 0. Correlations tested for relationships across all variables with special

attention paid to the variables of the current study's hypothesis such as self-efficacy, fairness perceptions, motivation to learn, and training outcomes.

The third set of analyses involved looking at the moderating effect of the ideal/actual self and personality. Moderating effects were analyzed using multiple regression (Cohen & Cohen, 1981). Presence of an interaction was determined by performing cross-product terms formed by multiplying the independent variables together. The targeted dependent variable was regressed on to the two independent variables as well as the cross product term. Significant regression weights for the cross product term indicated interactions. Moderating analyses were also conducted for the personality variables of interest, conscientiousness and openness.

Regression equations were formed using simple-slope formulas in order to identify the direction of the interaction (Aiken & West, 1991). In such a way, the relationship between the independent variable and the dependent variable can be seen as a function of the secondary independent variable.

Fourth, the model presented a mediating relationship between gain/loss-framed messages and behavioral outcomes, performance outcomes, and learning outcomes. A mediation test (James & Brett, 1984) was used to check this proposed relationship. Mediating relationships exist when the variable (in this case, motivation to learn, self-efficacy, and fairness perceptions were all proposed to mediate the relationship between framing and a training outcome) adds prediction of the dependent variable above that which was accounted for by framing effects. A regression analysis was run for the specific independent

variable (two different ones: gain framing and loss framing) predicting training outcomes (four specific outcomes: speed, accuracy, knowledge, and behavior). A secondary regression was run between the mediating variables and the training outcomes. These two regression analyses output the raw regression coefficients and standard errors needed to run the Sobel test of mediation. A Sobel test was used instead of a bootstrap test due to the large sample size (Preacher & Hayes, 2004).

# RESULTS

The results of this study follow the direction of the analytic strategy. The researcher states the results in the following order: first, the results of the descriptive data; second, the results of the main effects of framing; third, the results of the moderating hypotheses, and finally, the results of the mediating hypotheses are presented.

## Descriptive Data

Table 1 contains the combined means, standard deviations, and scale reliabilities of the measures for both the gain and loss-framed training participant responses. Table 2 includes the means and standard deviations of measures for gain and loss-framed training participant responses. In general, with the exception of the knowledge test, alias the Training Assessment Test, the scales showed sufficient reliabilities to proceed with the data analyses. Concerning the Training Assessment, there appeared to be no concern for floor or ceiling effects because the knowledge test showed sufficient range.

Table 1
Combined Means, Standard Deviations, and Reliabilities of Gain/Loss Reponses

| Variable | # Items | Mean | SD | Reliability |
|---|---|---|---|---|
| Procedural Justice | 10 | 2.90 | .57 | .82 |
| Distributive Justice | 10 | 2.45 | .56 | .83 |
| Self-Efficacy | 10 | 3.40 | .62 | .89 |
| Motivation to Learn | 10 | 3.73 | .70 | .89 |
| Mood | 16 | 78.06 | 16.10 | .80 |
| I/A Discrepancy (Time 1) | 5 | 6.41 | 3.74 | .79 |
| I/A Discrepancy (Time 2) | 5 | 8.91 | 3.65 | .72 |
| Training Reactions | 10 | 3.27 | .77 | .90 |
| Personality (Extraversion) | 8 | 3.54 | .74 | .85 |
| Personality (Agreeableness) | 10 | 3.94 | .61 | .80 |
| Personality (Conscientiousness) | 9 | 3.77 | .56 | .74 |
| Personality (Neuroticism) | 8 | 2.74 | .82 | .86 |
| Personality (Openness) | 8 | 3.59 | .62 | .76 |

Table 3 presents the inter-correlations between all the items that were studied. Demographic variables were not significantly associated with any of the variables of interest, which halted further investigation of demographic covariates. Additionally, personality variables had little association with the variables that were involved in the hypotheses of the current study. However, there were strong correlations between framing and motivation, distributive justice and procedural justice, ideal/actual discrepancy measures at Time 1 and Time 2, and manipulation check items. Further discussion of specific correlations follows.

## Main Effect Hypotheses

Hypothesis 1 stated that gain-framed training would increase self-efficacy. The correlation between gain-framed training and self-efficacy indicated a non-

significant effect of framing on self-efficacy ($r$ = .09, $p$ = .24). The result signifies a lack of support for Hypothesis 1.

Hypothesis 2 stated that gain-framed training would increase motivation to learn. Framing was significantly associated with motivation to learn ($r$ = 23, $p$ < .01). With the mean of the gain-framed participants as 3.86 ($SD$ = .55) and the mean of the loss-framed participants as 3.58 ($SD$ = .66), the results indicate that gain-framed participants had higher motivation to learn than loss-framed participants. An ancillary test utilizing Cohen's $d$ indicated that motivation to learn had a magnitude of $d$ = .40. Thus, Hypothesis 2 is supported.

Table 2
Means, Standard Deviations, and Reliabilities of Gain/Loss Reponses

| Variable | Loss Mean | Loss SD | Gain Mean | Gain SD |
|---|---|---|---|---|
| Procedural Justice | 2.91 | .55 | 2.90 | .58 |
| Distributive Justice | 2.35 | .50 | 2.53 | .60 |
| Self-Efficacy | 3.33 | .73 | 3.45 | .66 |
| Motivation to Learn | 3.58 | .66 | 3.86 | .55 |
| Mood | 78.94 | 15.78 | 77.29 | 16.41 |
| I/A Discrepancy (Time 1) | 6.42 | 4.3 | 6.39 | 3.27 |
| I/A Discrepancy (Time 2) | 8.79 | 3.4 | 9.01 | 3.84 |
| Training Reactions | 3.15 | .78 | 3.38 | .75 |
| Personality (Extraversion) | 3.50 | .73 | 3.58 | .74 |
| Personality (Agreeableness) | 3.94 | .62 | 3.94 | .60 |
| Personality (Conscientiousness) | 3.78 | .55 | 3.76 | .57 |
| Personality (Neuroticism) | 2.76 | .81 | 2.72 | .82 |
| Personality (Openness) | 3.55 | .57 | 3.62 | .67 |
| Performance Outcome | 19.42 | 70.8 | -7.01 | 77.7 |

Hypothesis 4 stated that fairness perceptions of participants who were placed in the gain-framed training would have lower perceptions of unfairness (both distributive and procedural measures of fairness) of the remedial training than those who were in the loss-framed training condition. Framing did significantly affect distributive justice perceptions ($r = .15$, $p < .05$). In addition, participants in the gain-framed training had higher perceptions of fairness as indicated by the mean of 2.53 ($SD = .60$) for gain-framed

Table 3

Inter-Correlations Among Variables

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1. Gain/Loss Framing | -- | | | | | | |
| 2. Gender | .017 | -- | | | | | |
| 3. Ethnicity | -.021 | .019 | -- | | | | |
| 4. Age | -.024 | .066 | .094 | -- | | | |
| 5. Procedural Justice | -.012 | .080 | .046 | -.027 | (.82) | | |
| 6. Distributive Justice | .154* | -.042 | .030 | -.005 | .543** | (.83) | |
| 7. Self-Efficacy | .087 | -.073 | .065 | .031 | .034 | .220** | (.89) |
| 8. Motivation to Learn | .225** | -.009 | .078 | .021 | -.054 | .040 | .329** |
| 9. Mood | -.051 | .098 | .025 | .060 | .077 | .067 | .205** |
| 10. I/A Discrepancy (T1) | .030 | -.053 | .009 | -.122 | -.016 | -.042 | -.154* |
| 11. I/A Discrepancy (T2) | -.004 | -.105 | .065 | -.068 | .048 | .022 | -.155* |
| 12. I/A Change | .024 | .074 | -.071 | -.050 | -.077 | -.103 | .012 |
| 13. Believability | .117 | .064 | -.038 | -.089 | -.112 | -.077 | .164* |
| 14. Interesting | .095 | .067 | .021 | -.081 | -.174* | -.140 | .240** |
| 15. Confusion | -.039 | -.014 | -.060 | -.048 | -.124 | -.067 | .253** |
| 16. Tone | .453** | .032 | -.092 | -.045 | -.017 | .053 | .127 |
| 17. Affective Outcome | .146* | -.022 | .008 | -.063 | -.241** | -.183* | .190** |
| 18. Knowledge Outcome | -.175* | .036 | .067 | .005 | .025 | .005 | .063 |
| 19. Performance (Accuracy) | -.018 | .051 | -.016 | -.011 | -.124 | -.086 | .038 |
| 20. Pre-Assessment | -.004 | -.070 | -.105 | -.120 | -.064 | .020 | .135 |
| 21. Extraversion | .053 | .016 | -.005 | -.009 | -.058 | -.077 | -.035 |
| 22. Agreeable | -.001 | -.045 | -.021 | .057 | .079 | .109 | -.070 |
| 23. Conscien | -.018 | -.052 | -.002 | -.036 | .086 | .144 | .016 |
| 24. Neuroticism | -.022 | -.021 | .086 | .054 | -.139 | -.130 | -.045 |
| 25. Openness | .057 | .046 | .014 | .017 | .019 | .010 | -.016 |
| 26. Performance (Speed) | .079 | .080 | .075 | -.012 | -.001 | .045 | -.087 |

NOTE: Reliabilty estimates are listed in parentheses along the diagonal where appropriate
n = 187, * p < .05, ** p < .01,

Table 3 Continued

Inter-Correlations Among Variables

| | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. | | | | | | | | | | |
| 2. | | | | | | | | | | |
| 3. | | | | | | | | | | |
| 4. | | | | | | | | | | |
| 5. | | | | | | | | | | |
| 6. | | | | | | | | | | |
| 7. | | | | | | | | | | |
| 8. | (.89) | | | | | | | | | |
| 9. | .191** | (.80) | | | | | | | | |
| 10. | -.041 | -.286** | (.85) | | | | | | | |
| 11. | -.078 | -.230** | .421** | (.86) | | | | | | |
| 12. | .052 | -.061 | .510** | -.566** | -- | | | | | |
| 13. | .240** | .098 | .039 | -.175* | .219** | -- | | | | |
| 14. | .412** | -.010 | .036 | -.019 | .084 | .503** | -- | | | |
| 15. | .111 | .103 | -.067 | .016 | -.073 | .258** | .356** | -- | | |
| 16. | .192** | .079 | -.005 | -.048 | .048 | .381** | .205** | .184* | -- | |
| 17. | .418** | .076 | .038 | .043 | .022 | .579** | .682** | .506** | .341** | (.90) |
| 18. | .035 | .160* | -.062 | .102 | -.179* | -.032 | .111 | .101 | -.001 | .063 |
| 19. | .238** | .048 | -.029 | -.058 | .035 | .059 | .119 | -.033 | -.025 | .111 |
| 20. | .052 | .141 | -.162* | -.156* | .004 | .014 | .002 | .139 | .098 | .091 |
| 21. | .055 | -.050 | .055 | .064 | -.003 | -.090 | -.019 | -.042 | -.067 | -.108 |
| 22. | -.091 | -.116 | .035 | .058 | -.034 | .024 | -.022 | -.075 | -.134 | -.061 |
| 23. | -.040 | .125 | .070 | -.018 | .049 | -.099 | -.080 | .044 | -.052 | -.088 |
| 24. | .014 | .022 | -.118 | -.043 | -.033 | .068 | .077 | -.084 | .078 | .087 |
| 25. | -.014 | .058 | -.018 | .023 | -.028 | -.077 | .046 | -.091 | .157* | -.021 |
| 26. | -.007 | .042 | .039 | .089 | -.048 | .009 | -.048 | -.022 | .086 | .036 |

Table 3 Continued

Inter-Correlations Among Variables

| | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|---|---|---|---|---|---|---|---|---|
| 1. | | | | | | | | |
| 2. | | | | | | | | |
| 3. | | | | | | | | |
| 4. | | | | | | | | |
| 5. | | | | | | | | |
| 6. | | | | | | | | |
| 7. | | | | | | | | |
| 8. | | | | | | | | |
| 9. | | | | | | | | |
| 10. | | | | | | | | |
| 11. | | | | | | | | |
| 12. | | | | | | | | |
| 13. | | | | | | | | |
| 14. | | | | | | | | |
| 15. | | | | | | | | |
| 16. | | | | | | | | |
| 17. | | | | | | | | |
| 18. | (.69) | | | | | | | |
| 19. | .142* | -- | | | | | | |
| 20. | .142 | -.169* | (.47) | | | | | |
| 21. | -.013 | .065 | .054 | (.85) | | | | |
| 22. | -.029 | -.079 | -.033 | .141 | (.80) | | | |
| 23. | .097 | -.062 | .122 | .118 | .278** | (.74) | | |
| 24. | .056 | .115 | .012 | -.277** | -.240** | -.245** | (.86) | |
| 25. | .021 | -.001 | .074 | .333** | .186* | .210** | -.102 | (.76) |
| 26. | .064 | .163* | -.005 | -.009 | -.039 | -.075 | .089 | -.014 |

participants and 2.35 (*SD* = .50) for loss-framed participants. A follow up Cohen's d metric indicated moderate effect size of *d* = .32. However, the results did not indicate such significance for procedural justice (*r* = -.01, *p* = .88). All together, these results indicate partial support for Hypothesis 4.

Hypothesis 5a stated that gain-framed training would increase performance as measured by speed and accuracy on the Naval Simulation Task. Participants did not significantly respond quicker in the gain or loss-frame (*r* = .08, *p* = .29). However, framing was significantly related to accuracy (*r* = -.18, *p* < .05), but not in the direction that was hypothesized. In fact, participants in the loss-framed whose training mean score was 19.42 (*SD* = 70.82) did significantly better than those in the gain-framed performance whose mean training performance was -7.01 (*SD* = 77.73). A Cohen's d metric indicated that the significant relationship is moderate, *d* = .30. However, given the large standard deviation, the researcher investigated the possible presence of influential outliers, and found no outliers beyond two standard deviations of the mean. Analyses revealed that the distribution was slightly negatively skewed, but there was little evidence for floor or ceiling effects. Thus, there was partial support for Hypothesis 5a.

Related to Hypothesis 5a, Hypothesis 5b stated that gain-framed training would increase learning as measured by a knowledge test. Framing had a non-significant effect on learning (*r* = .02, *p* = .83), indicating a lack of support for Hypothesis 5b.

Hypothesis 6 stated that participants would view the training more positively in a gain-framed training condition. Correlation results indicated that framing had a significant impact on affective outcomes as measured by training reactions ($r = .15$, $p < .05$). As indicated by the mean differences with gain-framed participants who averaged 3.38 ($SD = .75$) and the loss-framed participants who averaged 3.15 ($SD = .78$), participants in the gain-framed training reacted more positively to the training, leading to higher affective outcomes. An ancillary analyses of Cohen's $d$ metric indicated an effect size of $d = .30$. Thus, hypothesis 6 was supported.

Finally, as an exploratory measure, participants were asked to indicate their mood to determine its role in the Navy simulation task. While there was no direct relationship with mood from the framing ($r = -.05$, $p = .49$), mood did relate positively to motivation to learn, knowledge outcomes, self-efficacy, and the self-reported rating of the ideal/actual discrepancy. Because these relationships did not have further relevant implications, the current study did not explore mood further.

In summary, relating the results to the conceptual model presented in Figure 1, gain-farmed training did affect participants in several of the proposed relationships. Moderating relationships are now discussed.

## Moderating Hypotheses

Hypothesis 3 stated that the ideal/actual self-discrepancy would moderate the relationship between gain and loss-framed messages and self-efficacy. Although the stipulations for moderation were absent, the researcher confirmed

that moderating relationships did not exist. Following the protocol outlined by Cohen and Cohen (1981), the gain and loss-framed training was multiplied by the

Table 4
Regression Analyses Results of the Test of Moderation
of Ideal/Actual Discrepancy at Time 1 on Self-Efficacy

| Variable | B | SE B | ß | t |
|---|---|---|---|---|
| Framing [a] (A) | .15 | .13 | .11 | 1.16 |
| Ideal/Actual Discrepancy (IA) | -.03 | .01 | -.16 | -2.09** |
| A x IA | -.01 | .03 | -.02 | -.23 |
| Constant | 3.46 | .06 | | .00* |
| $R^2$ = .03 | | | | |
| F (3, 181) = 2.02, p = .11 | | | | |

** Significant at the p < .05
[a] Code: 0 = Loss, 1 = Gain

Table 5
Regression Analyses Results of the Test of Moderation
of Ideal/Actual Discrepancy at Time 2 on Self-Efficacy

| Variable | B | SE B | ß | t |
|---|---|---|---|---|
| Framing [a] (A) | .28 | .18 | .20 | 1.56 |
| Ideal/Actual Discrepancy (IA) | -.03 | .01 | -.15 | -2.01** |
| A x IA | -.03 | .03 | -.14 | -1.07 |
| Constant | 3.54 | .09 | | .00* |
| $R^2$ = .04 | | | | |
| F (3, 181) = 2.34, p = .08 | | | | |

** Significant at the p < .05
[a] Code: 0 = Loss, 1 = Gain

Table 6
Regression Analyses Results of the Test of Moderation
of Conscientiousness on Performance

| Variable | B | SE B | ß | t |
|---|---|---|---|---|
| Framing [a] (A) | -25.73 | 11.10 | -.17 | -2.32** |
| Conscientiousness (CON) | 13.09 | 10.00 | .10 | 1.31 |
| A x CON | -15.98 | 20.08 | -.06 | -.79 |
| Constant | 5.09 | 5.54 | | .92 |
| $R^2$ = .04 | | | | |
| F (3, 181) = 2.60, p = .05 | | | | |

** Significant at the p < .05
[a] Code: 0 = Loss, 1 = Gain

Table 7

Regression Analyses Results of the Test of Moderation of Openness on Performance

| Variable | B | SE B | ß | t |
|---|---|---|---|---|
| Framing [a] (A) | -26.30 | 11.10 | -.17 | -2.37** |
| Openness (OPN) | 6.66 | 9.26 | .05 | .72 |
| A x OPN | -29.02 | 18.78 | -.12 | -1.55 |
| Constant | 5.63 | 5.54 | | 1.02 |
| $R^2$ = .04 | | | | |
| F (3, 181) = 2.70, p > .05 | | | | |

** Significant at the p < .05

[a] Code: 0 = Loss, 1 = Gain

scores of the ideal/actual discrepancy measures. Self-efficacy was then regressed onto the gain and loss-framed condition and the ideal/actual discrepancy measure along with the cross product term. This procedure was followed with both checkpoints of the ideal/actual discrepancies, before the training and after the training. Tables 4 and 5 contain the results of this relationship. The hypothesized interaction was not observed. However, the ideal/actual discrepancy was significantly related to self-reported scores of self-efficacy.

To test for the interaction of personality with framed messages, in this case, conscientiousness and openness, the same procedures for Hypothesis 3 were used. Framing was multiplied by scores of the personality variable. Performance was then regressed onto the gain and loss framed condition and the personality variable along with the cross product term. Tables 6 and 7 include the results of both conscientiousness and openness. The hypothesized

interactions did not appear for either conscientiousness or openness. However, as reported before, framing did have an impact on performance. These results taken together do not support the conceptual model. The next set of analyses assesses the significance of potential mediators.

## Mediating Hypotheses

Hypotheses 7a, 7b, and 7c stated that the relationship between gain/loss-framed messages and training outcomes, such as affective, knowledge, and performance outcomes, would be mediated by self-efficacy. Although stipulations for mediation were absent, the researcher confirmed the absence of mediating relationships. Using the methods described by Preacher and Hayes (2008), a regression analysis was conducted with the gain/loss-framing predicting self-efficacy responses. A secondary regression was conducted with self-efficacy and the outcome. These two regression analyses yielded the raw regression coefficients and standard errors needed to run the Sobel test of mediation (Preacher & Hayer, 2004). The results of these tests can be found in Tables 8, 9, 10, and 11. The results indicate that self-efficacy did not mediate the relationship between the training condition and affective outcomes as measured by training reactions ($z = 1.08$, $p = .28$), performance as measured by accuracy ($z = .82$, $p = .41$), performance as measured by speed ($z = .12$, $p = .37$), and learning as measured by a knowledge test ($z = .45$, $p = .66$). These results indicate a non-significant effect of self-efficacy as a mediating variable, suggesting a lack of support for Hypothesis 7.

Table 8

Regression Analyses of the Test of Mediation of Self-Efficacy on Framing and Affective Outcomes

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | .12 | .10 | 1.19 |
| Framing [a] (b) | .20 | .11 | 1.80 |
| Self-Efficacy | .20 | .08 | 2.48** |

[a] Code: 0 = Loss, 1 = Gain
** Significant at the $p < .05$

Table 9

Regression Analyses of the Test of Mediation of Self-Efficacy on Framing and Performance (Accuracy)

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | .12 | .10 | 1.19 |
| Framing [a] (b) | -27.75 | 11.10 | -2.50** |
| Self-Efficacy | 9.00 | 8.06 | 1.12 |

[a] Code: 0 = Loss, 1 = Gain
** Significant at the $p < .05$

Table 10

Regression Analyses of the Test of Mediation of Self-Efficacy on Framing and Learning

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | .12 | .10 | 1.19 |
| Framing [a] (b) | .20 | 1.04 | .18 |
| Self-Efficacy | .35 | .73 | .48 |

[a] Code: 0 = Loss, 1 = Gain

Table 11

Regression Analyses of the Test of Mediation of Self-Efficacy on Framing and Performance (Speed)

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | .12 | .10 | 1.19 |
| Framing [a] (b) | .05 | .05 | 1.19 |
| Self-Efficacy | -.04 | .03 | -1.29 |

[a] Code: 0 = Loss, 1 = Gain

Table 16

Table 12

Regression Analyses of the Test of Mediation of Motivation on Framing and Affective Outcomes

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | .28 | .09 | 3.13* |
| Framing [a] (b) | .08 | .11 | .79 |
| Motivation | .51 | .08 | 5.89* |

[a] Code: 0 = Loss, 1 = Gain

* Significant at the $p < .01$

Table 13

Regression Analyses of the Test of Mediation of Motivation on Framing and Performance (Accuracy)

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | .28 | .09 | 3.13* |
| Framing [a] (b) | -29.00 | 11.32 | -2.56** |
| Motivation | 9.38 | 9.11 | 1.03 |

[a] Code: 0 = Loss, 1 = Gain

* Significant at the $p < .01$

** Significant at the $p < .05$

Table 14

Regression Analyses of the Test of Mediation of Motivation on Framing and Learning

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | .28 | .09 | 3.13* |
| Framing [a] (b) | -.50 | 1.03 | -.48 |
| Motivation | 2.70 | .84 | 3.22* |

[a] Code: 0 = Loss, 1 = Gain
* Significant at the p < .01

Table 15

Regression Analyses of the Test of Mediation of Motivation on Framing and Performance (Speed)

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | .28 | .09 | 3.13* |
| Framing [a] (b) | .05 | .05 | 1.13 |
| Motivation | -.01 | .04 | -.37 |

[a] Code: 0 = Loss, 1 = Gain
* Significant at the p < .01

Table 16

Regression Analyses of the Test of Mediation of Distributive Justice on Framing and Affective Outcomes

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | .17 | .08 | 2.11** |
| Framing [a] (b) | .28 | .11 | 2.46** |
| Distributive Justice | -.29 | .10 | -.21 |

[a] Code: 0 = Loss, 1 = Gain
** Significant at the p < .05

Table 17

Regression Analyses of the Test of Mediation of Distributive Justice on Framing and Performance (Accuracy)

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | .17 | .08 | 2.11** |
| Framing [a] (b) | -27.23 | 11.21 | -2.43** |
| Distributive Justice | 4.50 | 9.98 | .45 |

[a] Code: 0 = Loss, 1 = Gain
** Significant at the $p < .05$

Table 18

Regression Analyses of the Test of Mediation of Distributive Justice on Framing and Learning

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | .17 | .08 | 2.11** |
| Framing [a] (b) | .35 | 1.04 | .34 |
| Distributive Justice | -1.12 | .97 | -1.15 |

[a] Code: 0 = Loss, 1 = Gain
** Significant at the $p < .05$

Table 19

Regression Analyses of the Test of Mediation of Distributive Justice on Framing and Performance (Speed)

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | .17 | .08 | 2.11** |
| Framing [a] (b) | .04 | .04 | .99 |
| Distributive Justice | .02 | .04 | .45 |

[a] Code: 0 = Loss, 1 = Gain
** Significant at the $p < .05$

Table 20

Regression Analyses of the Test of Mediation
of Procedural Justice on Framing and Affective Outcomes

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | -.01 | .08 | -.16 |
| Framing [a] (b) | .22 | .11 | 2.01** |
| Procedural Justice | -.33 | .10 | -3.38* |

[a] Code: 0 = Loss, 1 = Gain
** Significant at the $p < .05$

Table 21

Regression Analyses of the Test of Mediation
of Procedural Justice on Framing and Performance (Accuracy)

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | -.01 | .08 | -.16 |
| Framing [a] (b) | -26.43 | 11.07 | -2.39** |
| Procedural Justice | 3.33 | 9.83 | .34 |

[a] Code: 0 = Loss, 1 = Gain
** Significant at the $p < .05$

Table 22

Regression Analyses of the Test of Mediation
of Procedural Justice on Framing and Learning

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | -.01 | .08 | -.16 |
| Framing [a] (b) | .13 | 1.03 | .13 |
| Procedural Justice | -1.49 | .92 | -1.62 |

[a] Code: 0 = Loss, 1 = Gain

Table 23

Regression Analyses of the Test of Mediation of Procedural Justice on Framing and Performance (Speed)

| Variable | ß | $\sigma_{\bar{X}}$ | t |
|---|---|---|---|
| Framing [a] (a) | -.01 | .08 | -.16 |
| Framing [a] (b) | .05 | .04 | 1.07 |
| Procedural Justice | .00 | .04 | -.00 |

[a] Code: 0 = Loss, 1 = Gain

Hypotheses 8a, 8b, and 8c stated that motivation to learn would mediate the relationship between gain-loss framed training and training outcomes such as affective, knowledge, and performance outcomes. Mimicking the same method described for the results of Hypothesis 7, two regression analyses were computed, and the results of these regression analyses can be seen in Tables 12, 13, 14, and 15. The results of the Sobel's analyses indicated that motivation to learn is a significant mediating variable between framing and affective outcomes measured by training reactions ($z = 2.77$, $p < .01$) and framing and learning as measured by a knowledge test ($z = 2.25$, $p < .05$). However, results indicated that motivation to learn did not mediate the relationship between gain/loss-framed training and performance outcomes as measured by accuracy ($z = .98$, $p = .32$) or speed ($z = -.03$, $p = .80$). These results indicate support for Hypotheses 8a and 8c but lack of support for Hypothesis 8b.

Finally, Hypotheses 9a, 9b, and 9c stated that fairness perceptions as measured by distributive and procedural justice, would mediate the relationship

to training outcomes. The same procedures as described in Hypotheses 7 and 8 were used here to test mediating variables. Results of the regressions on distributive justice are presented on Tables 16, 17, 18, 19, 20, 21, 22, and 23. They indicate that neither distributive justice nor procedural justice mediate the relationships between gain and loss-framed messages and affective outcomes as measured through training reactions ($z$ = -1.71, $p$ = .09; $z$ = .12, $p$ = .90, respectively), performance as measured by accuracy ($z$ = .44, $p$ = .66; $z$ = -.12, $p$ = .91, respectively), performance as measured by speed ($z$ = .49, $p$ = .63; $z$ = 0, $p$ = 1.0, respectively), and learning as measured by a knowledge test ($z$ = -1.01, $p$ = .31; $z$ = .12, $p$ = .90). The results of these analyses indicate a lack of support for Hypotheses 9a, 9b, and 9c.

Taken together, the results of Hypotheses 7, 8, and 9 indicate partial support for the conceptual model. The final analyses assess the validity of the experimental procedures.

## Manipulation and Tone Check

As expected, no differences in general evaluations of the messages emerged from self-reported measures. The gain and loss-framed training were rated equally believable ($r$ = .12, $p$ = .11), considering that the mean of the gain frame rating was 3.23 ($SD$ = .96) while the mean of the loss frame was 3.01 ($SD$ = 1.12). Similarly, participants did not have differing perceptions of confusion in the training ($r$ = -.04, $p$ = .60), considering the mean of the gain frame was 2.65 ($SD$ = .84) while the mean of the loss frame was 2.74 ($SD$ = 1.04); and participants found both of the trainings equally interesting ($r$ = .10, $p$ = .20),

considering the mean of the gain frame 3.31 (*SD* = 1.19) while the mean of the loss frame was 3.08 (*SD* = 1.26). Additionally, there was no significant difference between the two groups' understanding of their placement in remedial training: 98% of loss-framed participants indicated they were in remedial training and 100% of gain framed participants indicated they were in remedial training.

However, consistent with the objective of this study, differences emerged on specific manipulation checks. As indicated by the significant correlation ($r$ = .39, $p < .01$), participants in gain-framed training rated the training as focusing more on benefits of completing the Navy simulation successfully ($M$ = 2.19, $SD$ = .95), whereas participants in the loss-framed training condition rated the training as focusing on the costs of completing the Navy simulation incorrectly ($M$ = 4.34, $SD$ = 1.40).

In addition, differences emerged when participants were asked to list personal goals of completing the training. In an additional qualitative check, the researcher coded responses to the training goals checklist that was part of the Training Pamphlet. Participants' goals, which serve as an indication of internalization for the training condition, were rated from -2 to +2 on the degree to which the respondent's goals indicated a gain or loss-framed goal. Two additional research assistants trained in the coding scheme also coded the goals, resulting in a high level of agreement ($k$ = .77). Results from the coding indicated that the majority of participants internalized the training condition: 87% of gain-framed participants reported a gain-framed goal and 76% of loss-framed participants wrote a loss-framed goal. The average rating for loss participants

was -.15 (*SD* = 1.19) while the average rating for gain framing was 1.18 (*SD* = 1.24).

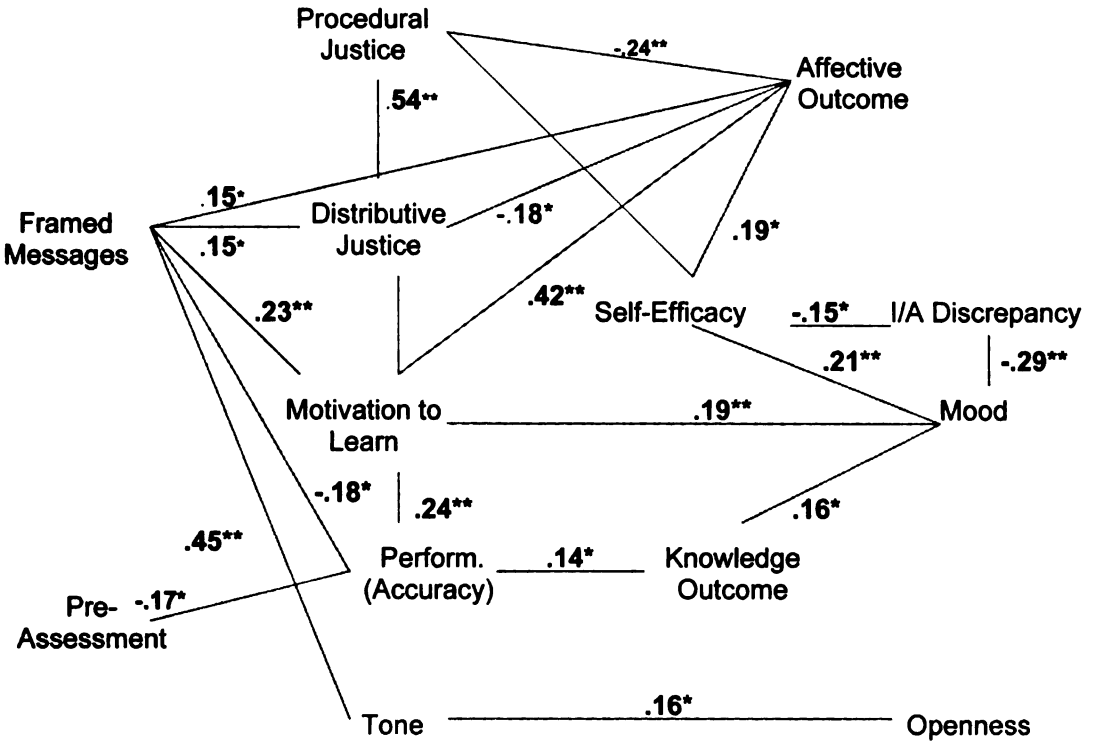
Finally, the overall tone of the video was rated as positive in the gain framed training (*M* = 3.65, *SD* = .84) than the loss framed training (*M* = 2.71, *SD* = 1.01). These results support the conceptual model's strength in manipulating the participants to internalize the gain and loss-framed messages. The implications and limitations of these results are now discussed.

# DISCUSSION

The purpose of the present study was to extend the research on ways to increase training effectiveness when the instruction is labeled remedial. The general question asked to what extent do certain types of messages received during remedial training influence training outcomes. The specific question asked to what is the effect of gain and loss-framed messages on multiple training variables and training outcomes.

As demonstrated in Figure 2, the author developed a conceptual model that illustrated the hypothesis: the enhancement of motivation to learn, self-efficacy, and fairness perceptions through framed messages affect training outcomes of remedial training. The model also proposed that an individual's ideal/actual discrepancy interacts with self-efficacy. Finally, the model included a number of individual characteristics that mediate the relationship between framing and training outcomes. Now, a revised conceptual is introduced.

The discussion of this study is divided into four parts. First, there is a summary of the study results combined with a graphical representation of the connections between the variables and outcomes. Second, there are implications of the study results along with a discussion of future research. Third, there is a revised conceptual model, reflecting on how well the proposed model fit with the results of the study. Finally, there is a discussion of the limitations of the study.




* p < .05, ** p < .01, Note: I/A Discrepancy at Time 1 (Time 2 had similar relationships)

Figure 5. Correlative Map of Significant Associations. *As pictured, framed messages had several direct and indirect pathways to outcomes.*

## Summary of the Results

As displayed in Figure 5, framing had several direct effects on outcomes. But, framing also took several indirect pathways to training outcomes. The following discussion describes those pathways and explains why certain pathways did not appear.

Structural Hypotheses. Hypotheses 1, 2, 4, 5, and 6 stated there would be a main effect of framing on training variables and training outcome. The current study found support that gain-framed training elevated motivation to learn and distributive injustice compared against those in the loss-framed condition. In addition to proximal outcomes such as increased motivation, gain-framed training also had a main effect on training reactions as compared to those in the loss-

framed training. Conversely, loss-framed participants performed more accurately than those in the gain-framed training condition.

Hypothesis 1, that noted that self-efficacy would be influenced by framing, was not supported. These results may have occurred because self-efficacy was already relatively high ($M$ = 3.40, $SD$ = .62). Additionally, the relationship of framing to self-efficacy may be more indirect as there is evidence to suggest that participants were willing to increase their knowledge and skills. The current study did find a connection between motivation to learn and self-efficacy ($r$ = .33, $p$ < .01), and association between framing and motivation to learn ($r$ = .23, $p$ < .01). Given that framing is related to motivation and motivation is related to self-efficacy, the current study does not explicitly rule out the possible effects of framing on self-efficacy – just that, it was not a direct effect. Researchers should continue to examine the effects of framing and self-efficacy, an area that is rarely explored, and should develop additional hypotheses to analyze indirect pathways from framed messages to increased self-efficacy.

The hypothesis that framing would affect procedural was also unsupported. DeDreu (1996)'s finding about justice perceptions associated with framing explains the results of the current study. He suggested in framed contexts participants are increasingly aware of distributive justice, rather than procedural justice. If this is true, then participants in the current study may have been less concerned about procedural justice, which would account for the non-significant difference in procedural justice. In either framed condition, trainees

tended to feel that they were placed in remedial training unfairly ($M$ = 2.90, $SD$ = .57 for procedural justice; $M$ = 2.45, $SD$ = .57).

Finally, several hypotheses stated that framing would be related to performance outcomes. Four measures of performance outcomes were used to test these hypotheses: (1) knowledge assessment, behavioral performance including (2) speed and (3) accuracy, and (4) affective outcomes measured by training reactions. Accuracy in performance and training reactions were related to framing, while speed in performance and knowledge were not.

It is not surprising that speed was not related to the framing-focused training because of the training program itself. Individuals in both training conditions were not explicitly given speed goals nor were they taught how to complete the simulation more quickly. It is even plausible to think that if the trainees completed the training correctly and learned the information as it was presented that they actually would spend more time, rather than less time, completing each trial. Because of the overall focus on quality over quantity, the results are not surprising. However, future research should explore the effect of adding framed messages to goals that are related to speed and timing.

Additionally, participants in the gain-framed training did not learn, as measured by a knowledge test, significantly better than those participants in loss-framed training; and those who did perform better were not in the gain-framed condition. There may be five reasons for the lack of evidence for these proposed relationships.

*Knowledge Outcome Literature.* First, researchers such as Lee and Aker (2004) and Toll et al (2007) have used gain and loss-framed messages to demonstrate behavioral change and attitude change. However, there is little evidence from the framing literature to suggest that framed messages affect knowledge outcomes specifically. This may be the case in the current situation; perhaps framed messages cannot influence knowledge transfer. Researchers should explore the relationship between framed messages and knowledge transfer.

*Lack of Control Group.* Second, training may have equally improved knowledge regardless of condition. Accordingly, Kanfer & Ackerman (1989) and Winne (1996) have reported that reminders of goals throughout training have an impact on training outcomes. Perhaps the training itself increased knowledge. Descriptive data does suggest that the training itself did affect knowledge transfer. Participants on average increased their knowledge outcome by 5.12 points ($SD$ = 6.53). Given that there was no control group to compare both conditions against, it is difficult to assess if the framed training universally assisted in knowledge transfer, or if the training itself was the ultimate knowledge enhancer. Therefore, researchers should consider including a control group with neutral messages to determine if the mere presence of framed messages has an impact on knowledge outcomes.

*Negative Transfer Problem.* Third, the training evaluation procedure may have presented a negative transfer problem. That is, the program, Tandem, may been overly complicated. So much so, that the participants were unable to

clearly demonstrate their assimilation of the knowledge presented in the training. For example, the trainees had to "right mouse click" certain items while "left mouse click" other items in addition to holding down the mouse click for a certain duration to ensure the participant was able to understand what was happening in the program.

Additionally, the interface utilized a MS-DOS type environment which is very unfamiliar to the participants who are accustomed to sleek, user-friendly gaming interfaces present on popular gaming systems by Nintendo, Sony, and Microsoft. Because the program is so complicated, researchers who use the Tandem program sometimes run their participants through over 20 trials to ensure the participant has a clear understanding of what is happening. Therefore, the presence of difficult transfer environment may in itself presented an issue related to performance outcomes. Future researchers should attempt to replicate this study using a less complicated training system.

*Arousal and Attention Theory.* Fourth, the reason for the loss-framed advantage for performance outcomes may come from theories about arousal and attention. First, as indicated by Payne et al (1993), individuals spend more time on loss-framed messages. Likewise, they have increased cognitive activity when processing loss-framed messages, which takes additional processing time. Researchers have found links between time and accuracy (Maag, 1993). Thus, a preliminary consideration between loss-framed messaging and outcomes may have to do with the amount of time spent on processing the information. Other

theories may come into play regarding the success of loss-framed performance outcomes.

Second, researchers such as Pashler (1998) and Triesman (1964) have examined the role of attention and arousal. They have speculated that, given the enormous amount of information that each individual encounters, there has to be something that guides what is given attention. Known commonly as a "cocktail party effect," unattended stimuli receive no further attention while attended stimuli receive full attention. Other theorists such as Deutsch and Deutsch (1963) suggest that all stimuli are given attention. Both types of theories have been grounded in neuropsychological models, which are far too complex for the extent of the current study. Nevertheless, the theories on attention lead to interesting interpretations of loss-framed messages. Given that they are grounded in additional processing time and that they emphasize a benefit lost, perhaps the presence of a loss message arouses the senses to sustain greater attention.

The loss-message may arouse attention from the senses for two reasons. First, loss-framed messages may engage "fear" which is demonstrated by loss-framed messages such as, "If you don't floss, you will contract disgusting gum diseases." These fear-induced messages as researched by Baron, Logan, Lilly, Inman, and Brennan (1994) and Meijnders, Midden, and Wilke (2001) evoke greater processing time and may indeed lead to behavioral changes, such as performing better on the task of the current study.

The second reason for loss-framed advantage in performance measures may come from the "negativity bias" (Cacioppo & Gardner, 1999). Researchers

have discovered the gain and losses are "psychologically asymmetrical" because persons are sensitive to losses. Individuals wish to avoid all possible losses. Because of this, information presented in terms of losses are detected at much lowered levels than gain-framed messages. For example, it is likely for an individual to perceive a phrase as "loss" oriented because of the presence of just one word. Conversely, it may take several "gain" framed words for an individual to process that phrase as gain-framed.

These two reasons, fear and bias, lead O'Keefe and Jensen to conclude that loss-framed messages lead to longer processing than gain-framed messaging. Again, this extended attention may lead to higher behavioral outcomes and should be focus of future research. This, however, may be altered if the participant can internalize the framing.

*Internalization of Framing.* Finally, the participants in the framed conditions may not have internalized the framed conditions fully. Although a high level of participants internalized the responses, there were still 34 participants who did not report training goals that related to framed-training; instead they reported, "non sense" goals such as, "I will save the environment" and "I need a new pencil." As a result, a post-hoc analysis was run. Participants who did not report a gain or loss-framed message

Table 24
Inter-Correlations with Internalized-Framing Participants

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1 Gain/Loss Framing | | | | | | | | |
| 2 Procedural Justice | -.04 | | | | | | | |
| 3 Distributive Justice | .13 | .58** | | | | | | |
| 4 Self-Efficacy | .10 | .03 | .23** | | | | | |
| 5 Motivation to Learn | .30** | -.06 | .08 | .35** | | | | |
| 6 Affective Outcome | .20* | -.17* | -.10 | .23** | .38** | | | |
| 7 Knowledge Outcome | .42** | -.13 | -.03 | .04 | .27** | .13 | | |
| 8 Performance (Accuarcy) | -.17* | .04 | .06 | .04 | -.07 | -.02 | .01 | |
| 9 Performance (Speed) | .09 | .00 | .04 | .05 | .18* | .03 | .22* | .07 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

goal were dropped from the correlation analysis. Results suggest that internalization is an important part of training outcomes, as indicated by significant differences in the relationships.

As Table 24 states, the knowledge outcome becomes significantly related to framed training when those who did not internalize the training goals are removed ($r = .42$, $p < .01$). As indicated by the differences between participants in the gain-framed condition who averaged at 15.26 ($SD = 4.75$) and the loss-framed participants who averaged at 10.32 ($SD = 5.99$), participants in the gain-framed training had higher knowledge outcomes than those in the loss-framed training. In fact, the association becomes the biggest effect size, $d = .75$, for the current study. These results suggest that in order for framing to be effective on training outcomes, participants must internalize the framed condition in which they are placed.

Other training outcomes became significantly correlated when non-internalized participants are removed. Of interest, speed related to both motivation ($r = .18$, $p < .05$) and knowledge outcomes ($r = .22$, $p < .05$). Again, both results revealed that participants who had higher motivation also performed trials quicker and had higher knowledge outcomes. These results contradict previous findings by Quinones (1995) who noted that performance outcomes were unrelated to motivation when participants are placed in different training assignments.

The remaining results are similar to the results when all of the 187 participants are considered. Yet again, motivation to learn mediated the relationship between framing and knowledge outcomes, $z = 1.86$, $p < .05$. However, procedural justice, distributive justice, and self-efficacy did not mediate the relationship between framing and knowledge outcomes ($z = -1.15$, $p = .25$ for procedural justice, $z = -.67$, $p = .80$ for distributive justice, and $z = .01$, $p = .99$ for motivation to learn). Additionally, there were no significant effects of openness (ß = .03, $p = .77$) or conscientiousness (ß = .01, $p = .86$) as moderators between framing and knowledge outcomes as reported by their non-significant standardized regression coefficient for the interaction term. The implications of these findings are discussed later.

Moderating Hypothesis. The current study proposed that an individual's ideal/actual discrepancy would moderate the relationship between framed messages and self-efficacy. Support for Hypothesis 3 was not found. However, the ideal/actual discrepancy measure was related to self-reported self-efficacy.

There are several possible reasons for non-significant effects of the moderator. First, Tykocinski, Higgins, and Chaiken (1994) noted that framing engages self-esteem differences in ideal/actual discrepant individuals, not self-efficacy specifically. Although it was argued that the differences between self-esteem and self-efficacy are "psychologically meaningless," future research should explore if self-esteem instead of self-efficacy would differentially affect the messages of gain and loss messages.

Secondly, the sample had a relatively low discrepancy level with no individuals reporting a discrepancy higher than 18 (measure ranged up to 25). For example, at the first measure of the ideal/actual discrepancy, participants were relatively low in this discrepancy with a reported mean of 6.41 (*SD* = 3.73). These relatively low scores make it difficult to see how individuals who are high on the ideal/actual discrepancy interact with framed training.

In addition to the lack of support for the interaction with the ideal/actual discrepancy, there was no evidence that personality interacts with framed messages. Future research should attempt to further investigate the interactions of personality and framed messages in a training context, as this is the first attempt to look at personality's interaction with framed messages in training. While the moderating analyses were not supported, the mediated hypotheses were partially supported.

Mediating Hypotheses. The current study proposed there would be several mediating effects of self-efficacy, motivation to learn, and fairness perceptions on the relationship between gain and loss framed-messages and

training outcomes. The study found that motivation to learn, which mediated the relationship between framing to training reactions and knowledge outcomes.

The lack of support for self-efficacy as a mediator may come from the fact that the current study did not effectively increase self-efficacy through framed messages. As Gist and Mitchell noted (1992), a trainee arrives to their self-efficacy level through three steps: (1) assessment of the task as it relates to his or her ability, (2) assessment of past performance on the task, and (3) assessment of the available resources to complete the task. The current study may not have presented individuals with all three steps to elevate self-efficacy level through framed messages. First, the study used a task that was unfamiliar to the trainee. As a result, the participant had limited abilities. Second, the researcher told the trainee that they had already failed to complete the pre-assessment satisfactorily. Therefore, the assessment of past performance does increase self-efficacy. The final piece of a trainee's self-efficacy, the available resources, was the only part of the self-efficacy that framed messages actually targeted. Therefore, the current study only used one of the steps to target self-efficacy through framed messages.

Researchers should address how self-efficacy can be specifically targeted through framed messages utilizing all three levels of Gist and Mitchell's theory of a trainee's self-efficacy. For example, framed messages could be included to reveal the actual training assignment. As Gist and Mitchell (1992) noted, participants assess self-efficacy when they evaluate the task based on past performance. If participants had received the assessment results in terms of

framed messages rather than the neutral message they received, perhaps their self-efficacy would have interacted with framed messages.

In addition to the lack of the mediating effect of self-efficacy, there was a lack of support for fairness perceptions as a mediator on training outcomes. As noted, gain framed training did increase perceptions of fairness. Additionally, fairness perceptions were related to training reactions. However, there was no mediation. The lack of mediation is similar to Quinones' results (1995).

Conclusions: Consider all the relationships that were supported in this study and note the revised conceptual model in Figure 6 that shows that framed messages directly affect training outcomes, motivation to learn, and fairness perceptions. Figure 6 displays the results for gain-framed training only because loss-framed training did not have the same type of significant relationships.

As shown in Figure 6, the framed messages trainees hear as they enter remedial training have a direct impact on their performance. More specifically, they respond to gain-framed messages by perceiving the training they received more positively. In the loss-framed condition which is note shown in Figure 6, trainees react to loss-framed messages by performing more accurately on the task.

gain framed-training to promote achievement of affective goals. Likewise, trainers may employ loss-framed training to affect the behavioral outcomes of training. Further, if a trainer is able to persuade trainees to internalize gain-framed training, the trainer may help learners to achieve several training goals such as increased motivation to learn, increased fairness perceptions, increased knowledge outcomes, and increased affective outcomes.

Second, researchers may extend the findings by continuing to examine the unique role that gain and loss-framed messages have on behavioral outcomes. As indicated in the current study, researchers may pursue the idea that gain and loss framed messages have distinctly different and independent effects and applications. For example, loss-framed messages increased accuracy performance. However, gain-framed messages increased motivation to learn. This is not to say that loss-framed messages had no effect on motivation to learn or that gain-framed messages had no effect on performance outcomes – just that, they did not work together.

Gain and Loss-Framed Outcomes Mismatch. To reiterate, both gain and loss-framed messages seem to act differently depending on the context. In examining the results of this study we may note an interesting paradox: gain and loss-framed messages independently affected two variables that should be related, motivation to learn and performance. This relationship creates interesting research questions.

Theoretically, other things being equal, higher motivation to learn leads to higher performance outcomes than lower motivation to learn (Mathieu, Martinue,

## Implications and Directions for Future Research

The results of this study are consistent with the research on remedial training and framed messages: remedial training has negative training outcomes, and gain and loss-framed messages influences an individual's behavior. Consequently, the results of this study have implications for practice and research related to training effectiveness especially for remedial training and framing research.

Training Effectiveness. Three outcomes of this study confirm Quinones' training effectiveness results. First, Quinones (1995) indicated that remedial assignment is a continuous method of informal feedback that has the detrimental effect of negating the effectiveness of the remedial assignment. The results of this study agree with Quinones' results, suggesting that remedial training assignment affects training effectiveness. Second, Quinones' (1995) participants in remedial training reported less fairness compared to those participants in the so-called advanced training condition. Here too, participants reported relatively lower fairness, suggesting that remedial training leads to lowered perceptions of fairness. Third, one of the strongest effects in Quinones' study was that framing affected motivation to learn, which was found in this study as well. These three outcomes have implications for trainers and researchers.

First, trainers may apply the results of the current study to stop the negative effects of remedial training. For example, trainers may use gain-framed messages to increase motivation to learn, to decrease perceptions of unfairness, and to persuade trainees to see training as beneficial. Trainers may also use

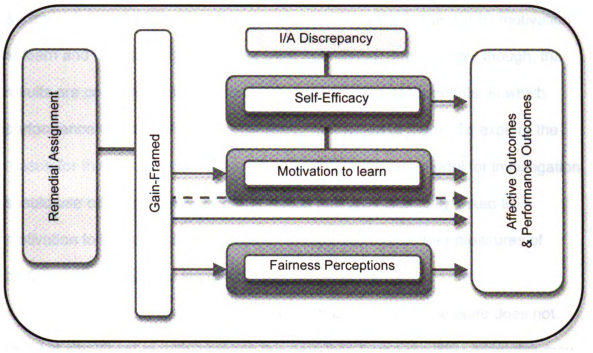



Figure 6. Resulting Conceptual Model for Gain-Framed Participants Only. *After participants are given selected gain-framed training, participants experience higher motivation to learn, higher perceptions of fairness, and higher selected performance outcomes.*

Additionally, responding to gain-framed messages trainees increase motivation to learn and simultaneously decrease perceptions of unfairness for the placement into remedial training. While there are no direct effects of framing on self-efficacy, a trainee's motivation to learn is related to self-efficacy, which was also related to the ideal/actual discrepancy. Despite these outcomes, the ideal/actual discrepant individual does not have any direct relationship to the framing.

& Tannenbaum, 1993). However, this was not the case in this study; motivation to learn and performance outcomes were not related. Interestingly though, the results are consistent with Quinones' work on training assignments, in which performance outcomes were not related to motivation to learn. To explore the reason for this result, researchers who use this study as a model for investigation should use other measures of performance that are historically linked to motivation to learn, leading to research the question: can other measures of performance capture an increase in motivation to learn?

If researchers conclude that a different performance measure does not result in significant results, perhaps this gain-loss-frame resulting mismatch may be due to from specificity of training goals. Detweiler, Bedell, Salovey, Pronin, and Rothman (1999) indicate that the goal has to be tangible and specific for gain-framed messaging to be more influential than loss framing. Otherwise, vague outcomes are more influences by loss-framed training. This relationship was demonstrated for health screening such as mammograms (Banks et al, 1995), and is demonstrated in the present study. While this study presented examples of what would happen if a participant failed to complete the training accurately, participants had little "connection" to that specific outcome (i.e. the majority of participants had no personal association with doing well in a navy task because they have no intention of joining the Navy). Specifying that participants will "take more lives" or "feel badly" may fall within the "vague outcome," in which loss frame is best utilized. Researchers should make training goals specific in order to see if this may influence the effect of gain-framed messages, leading

researchers to answer the question: Does creating specific training goals itself have an affect on gain and loss framed messages?

Advanced Training. While the research leads trainers and researchers to conclusions about how to conduct necessary remedial training, researchers have not analyzed advanced training. Quinones (1995) identified three types of training: Advanced, Remedial, and "Neutral"/Control. This study identified clear training outcome differences for messages received during remedial training. Researchers should consider expanding the investigation of gain and loss framing to advanced training conditions and including a control condition that utilizes neutrally framed messages.

Researchers may ask: Will participants respond the same way to framed-messages in an advanced training condition? Given that the variables motivation to learn, and accuracy in performance, were stronger in opposite conditions - that is, a gain-framed condition paired in a remedial training context - researchers may consider how gain-framed conditions paired in advanced training contexts will affect participants.

Additionally, if researchers used a control group they could answer questions such as how framed messages affect knowledge outcomes. For example, with a control group, researchers could compare neutral messages to both gain and loss-framed messages to see if framed messages produce relatively greater knowledge in relatively shorter times. Researchers could also find overall effect sizes that framed messages have on behavioral outcomes utilizing a standard Cohen's *d* equation.

Training Context. In addition to different training labels, researchers should look at the context, which these labels can create. Researchers have suggested that trainers should be aware of training context and devise strategies to increase pre-training self-efficacy, motivation to learn, etc. These tasks can add substantial time to the training curriculum. The current study presents a way to blur the line between training context and training design. The pre-training exercises that once required separate sessions can be incorporated into the training design easily without the time and financial cost. Framed training automatically includes ways to increase motivation to learn and increase fairness perceptions simply through the way the messages are framed.

Motivation to Learn. The results of the present study are partially consistent with past findings. Tannebaum et al (1991) demonstrated the importance of motivation to learn on training effectiveness. Individuals who have increased motivation to learn tend to master more of the training information presented, which translates into increased knowledge and behavioral transfer. In the current study, participants who had increased motivation also performed better on the Navy Simulation Task. However, motivation to learn was not associated with knowledge outcomes. Therefore, the study only partially supported the connection between motivation to learn and performance outcomes. Nonetheless, motivation to learn did have positive effects in the current study.

Nevertheless, because of the relationship between motivation to learn and performance outcomes, Quinones (1995) noted that trainers should be aware of

factors such as training assignment that decrease motivation to learn. The results suggest that, by utilizing framed messages, trainers can overcome the reduction of motivation to learn. Framing may lead to higher levels of motivation to learn, which was indeed one of the strongest impacted variables of the framing conditions.

Researchers should take this finding further to examine to what extent does motivation to learn vary by framed condition. Given that motivation to learn did not extend its relationship to performance outcomes, this leaves an interesting relationship that needs further explanation. Researchers should take note that framing does increase motivation to learn but should determine how much motivation is needed to actually affect performance outcomes when attempting to manipulate motivation levels through gain-framed training.

Fairness Perceptions. This study represents an early attempt to determine the role of gain and loss-framed messages on fairness perceptions. Taken alone, fairness perceptions do not seem to have an impact on behavioral outcomes. But as Quinones (1995) demonstrated on training outcomes, perceiving a training program as fair indeed affects training outcomes and can lead to behavioral changes. The results assists in alleviating the negative outcomes associated with poor fairness perceptions in training assignment (Quinones, 1995), again helping to break the cycle of negative outcomes that remedial training presents. As presented earlier, remedial training and "special" training interventions will continue but again, by simply utilizing targeted

messages trainers may have a way to assist in altering perceptions – at least with distributive justice.

However, our study failed to present a way to alter procedural justice perceptions. Procedural justice is defined by the procedures that helped individuals (in this case, the researcher) arrive to decision outcomes (placement into the remedial assignment). Given that gain-framed messages appear to assist in helping alleviate perceptions of distributive injustice, researchers should analyze pathways in which gain framing may also affect procedural justice.

Framing Effects. While the intent of the study was to capitalize on established theories on framing to break the cycle of negative outcomes of negative outcomes, the current study added an interesting theoretical question on framed theory. That is, do participants need to internalize framed messages in order for the framed effects to be effective? This was seen especially with the knowledge outcomes in the current study.

The idea of internalizing framed behavior is not a new one. Toll et al (2007) asked participants to list reasons they should complete a smoking cessation program. However, the researchers did not report any descriptive statistics on the rate of internalization nor did they indicate how reported goals related to behavioral outcomes. Other studies that were discussed for the literature review did not indicate any type of reporting of framed goal orientation. Therefore, the current study represents one of the first studies to analyze the role of internalization on behavioral outcomes.

While the current study measured internalized framed by the self-reported goals of completing the training successfully, future researchers should analyze other methods of ensuring internalization has happened. Once this method has been validated, researchers can pursue additional means as to which internalization affects outcomes of framed interventions, including training.

Combination of Gain and Loss Effects. In addition to internalization, the present study's somewhat conflicting results, concluding that gain-framed training is better for affective outcomes while loss-framed training is better for performance outcomes, leads to an interesting research question. That is, could the effect of gain and loss-framed messages be combined in some way?

As mentioned before, Quinones (1995) did utilize both messages in his training curriculum. However, this was done unintentionally and without planning, which should not discredit his research because gain and loss-framed messaging is present in everyday language. Therefore, an important extension of this research study would be determining if certain parts of the training coded with different types of framing would result in both performance and behavioral outcomes. For example, the training curriculum that deals with feeling confident about the training may be coded with gain-framed messaging while the curriculum that deals with increasing performance in the simulation may be coded with loss-framed messaging. In such a way, the power of both gain and loss-framed messaging would be utilized in a strategic way.

## Study Limitations

This study has limitations which must be taken into account when interpreting the results and designing future studies. First, a college student population provides only limited generalizability to the older populations, which is typical of the workforce. The current study is one of few studies that actually utilized gain and loss-framed in a college sample. An older population may react differently to gain and loss-framed messages in training. However, given that several studies have looked at gain and loss-framed messages in an older population and successfully demonstrated changed behavior, researchers can believe that the results presented in the current study will generalize to other populations.

Second, the present study utilized a task that was highly unfamiliar to the participants. Future studies should use remedial training for skills that are more familiar to participants such as an office task or a generic educational domain such as math or verbal skills. The reasoning for picking an unfamiliar task was to limit influence of previous knowledge on training outcomes. Experience could be an added factor into predicting success and should be accounted for in follow up studies. Having more experience with a task may enhance or inhibit gain-framed messages on the effects of motivation to learn, self-efficacy, and fairness perceptions.

Third, the training course was a short one-hour session, which is an uncommon practice of most organizations. Goldstein (1993) noted that training

sessions typically last at least a half-day and may continue for several days after that. However, with such extended training courses, extended motivation is required and as such, this study captured participants' motivation to learn before it became fleeting. However, given that framing had the strongest effect on motivation to learn, additional research may look to see how motivation to learn interacts with time of the training program.

## CONCLUSION

This study is an effort to generate knowledge to help trainers mitigate the negative outcomes of remedial training such as low performance outcomes and reduced motivation to learn. From this work researchers and practioners may see a way to confront the problem: using targeted gain and loss-framed messages. The results indicate that gain-framed messaging increase motivation to learn and loss-framed messaging increases accuracy in performance. However, this study used a shortened, simplified training program that should be expanded to ensure the results can be replicated in more realistic training situations.

Although the evidence does not present a clear, universal direction for trainers, it would seem sensible that, depending on the type of training, trainers could use gain-framed messaging for affective training and utilize loss-framed messaging for performance training.

Additionally, although performance outcomes are generally favored by Fortune 500 companies over affective outcomes, research on affective implications for the organization should be recognized. For example, Babakus,

Yavas, Karatepe, and Avci (2008) found that performance as measured by service quality was mediated by affective variables such as organizational commitment and job satisfaction. This type of relationship is consistent with other types of research that suggest job satisfaction can be linked to employee turnover (Mobley, 1977). In such a way, there is much to be said about the importance of affective outcomes. So much so, perhaps affective outcomes may produce long-term effects on performance outcomes. While current researchers continue to examine the long-term effect of affective outcomes and its relationship to performance outcomes, the current study offers an array of solutions to the negative outcomes of remedial training.

Future research should focus on expanding the role of framing to other training domains such as continuous learning and other training labels such as advanced training. In such a way, trainers and researchers can continue to break the negative outcomes that remedial training presents and can utilize the power of framed messages in training.

## Appendix A: Consent Form

### AIR DEFENSE TASK TRAINING STUDY

This research study investigates the effectiveness of a training program in improving performance on a computer task. Over two sessions, you will be asked to complete an electronic Training Assignment Test as well as a few other measures. This first session, which is online, will last approximately thirty minutes. You will then be asked to sign up for a subsequent session in which you will be assigned to a training program. You will then be given an opportunity to work on the Air Defense Task. This second session should last approximately one hour.

Your participation in this research 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. Your individual results in this study will be CONFIDENTIAL. You will be assigned a unique eight-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.

There are no foreseeable risks associated with participating in this research study. Your name and information will remain confidential. Your privacy will be protected to the maximum extent allowable by law. The data will be saved for the duration of the study and will only be accessible by the primary investigator and two additional researchers. You may refuse to participate in certain procedures or answer certain questions. Participation is completely voluntary. You may choose not to participate at all and may discontinue your participation at any time without penalty or loss of benefits.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury, please contact the Adam Massman at 512-876-7691, or by e-mail, massmana@msu.edu, or by regular mail at 302 Psychology Building, MSU, East Lansing, MI 48824. If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at 517-355-2180, Fax 517-432-4503, or e-mail irb@msu.edu or regular mail at 202 Olds Hall, MSU, East Lansing, MI 48824.

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

*Participant will electronically click "I consent" or "I decline to consent"*

Appendix B: Training Assessment Task

The following test measures your understanding of the material, which you have read regarding the Air Defense Task. Your responses to this test will determine which training program you will be assigned to on the subsequent session. Those scoring above average on this test will be assigned to Advanced Training. Those scoring below average on this test will be assigned to Remedial Training.

**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.

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

# 21:

**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

# 22:

**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

# 23:

**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

# 24:

**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

# 25:

**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

# 26:

**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

# 27:

**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

# 28:

**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

#29:

**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

# 30:

**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

...

**Scenario Background**
You are the Captain of a U.S. Navy Aegis-class cruiser. Your ship is part of a task force currently stationed in a military zone. You have received reports of enemy contacts and your ship is on alert. You are seated on the bridge of your ship where you can receive information from all your ship's sensors on your radar screen. Your job is to shield your ship from hostile enemy vessels and to avoid destroying peaceful vessels.

Your ship is in the center of the radar scope on your screen. Surrounding your ship are a number of asterisks called "targets." The sensors on your ship provide you the information you need to classify these targets according to their characteristics. First, each target can be classified as being Type Air, Sub, or Surface indicating the target is an aircraft, submarine, or surface ship. Second, the Class of each target can be Civilian or Military. Finally, the Intent of each target can be classified as either Peaceful or Hostile. You must decide what action your ship should take toward each target by deciding the Type, Class, and Intent of each target.

**Hooking Targets**
In the lower right corner of your radar, you see the Hooked Track #. Each of the targets on your radar is assigned a track number. When you "hook" a target, by placing the mouse pointer on the target and clicking the left button, the Hooked Track # changes to correspond to the target number. When you gather information from your ship's sensors, that information will be given for the target you currently have hooked. Each target retains the same track # throughout the simulation.

**Using Menus**
The menus are operated with the right mouse button. Click the right mouse button on a menu to display it. Press and hold down the right mouse button to display the information gathered by your sensors. The sensor information is displayed in the lower right corner of your radar.

**Making Cue Decisions**
On the far upper right corner of your radar, you see OPER, TYPE, CLSS, and ITNT. These are pull-down menus which allow you to gather the information from your sensors you need to make the Type, Class, and Intent decisions. However, your sensors are not 100% reliable and may tell you the requested information is unknown or they may even provide you conflicting information. However, at least two cues will always be accurate. Given this fact, you may increase your decision-making efficiency by gathering only the minimum amount of information

necessary to make a correct decision. You can always make the best decision by choosing the option indicated by the majority of cues.

Only one of the three pieces of information you can get for a decision may be ambiguous, so the maximum pieces of information you need to gather is three. If the first two pieces of information you gather agree, you do not need to gather any more information to make a correct decision. If you gather two pieces of information and one indicates one decision but the other indicates a different decision, you need to get a third piece of information to make a decision.

The first three items in the TYPE, CLSS, and ITNT menus provide you the information to make the (1) Type (ID_Air/Sub/Surface), (2) Class (ID_Civilian/ Military), (3) Intent (ID_Peaceful/Hostile), and (4) Engage (Engage_Shoot/ Clear). There are rules to follow to interpret each piece of information and make the correct decision for each target. This manual contains all those rules in the sections on the following pages. Memorizing those rules will help you in the simulation.

As you make these decisions, the targets will change shape and color to reflect your decisions. Do not worry about this.

**Decision Rules Overview**
The first five items in the TYPE, CLSS, and ITNT menus provide you the information to make the following decisions:

(1) Type (ID_Air/Sub/Surface)
(2) Class (ID_Civilian/Military)
(3) Intent (ID_Peaceful/Hostile)

You must make the decisions in this order.

As you make these decisions, the targets will change shape and color to reflect your decisions. Do not worry about this.

There are rules to follow to interpret each piece of information and make the decision for each target. This manual contains all those rules in the following sections. NOTE INFORMATION WAS DELTED

The TYPE menu allows you to gather the information needed to determine whether the target is an aircraft, a submarine, or a surface vessel, that is, whether the target is Air/Sub/Surface. The table below lists the pieces of information needed to make the target Type decision and the rules for interpreting each piece of information needed to make the Type decision.

AIR
Speed is >35 knots

Altitude/Depth is >0 feet
Communication Time is 0 - 40 s.

SURFACE
Speed is 25 - 35 knots
Altitude/Depth is 0 feet
Communication Time is 41 - 80 s.

SUB
Speed is 0 - 24 knots
Altitude/Depth is <0 feet
Communication Time is 81 - 120 s.

**Example of TYPE decision**
We will use information about target Speed to illustrate the rules for making the ID_Air/Sub/Surface decision. The Speed of a target tells you how fast the target is moving. This helps you make the decision about the target's Type; that is, whether the target is an aircraft, submarine, or surface vessel. The meaning of the Speed values are shown below.

Speed > 35 knots indicates the target is an aircraft (Type = Air)
Speed 25-35 knots indicates the target is a surface vessel (Type=Surface).
Speed 0-24 knots indicates the target is a submarine (Type=Sub).

For example, if the Speed value is 115 knots, the target you have hooked is traveling at 115 knots. Since this value is greater than 35, it indicates the target Type is Air. Since your sensors may give incorrect information, you must gather as much information as you need to make the best decision possible. Also, the Speed of a target allows you to estimate how far the target will travel on your radar screen during the simulation. This can help you judge which targets need to be acted on quickly and which targets can be dealt with later. When you are ready to make the Type decision, choose ID_Air/Sub/Surface from the bottom of the Type menu. A list of choices appears in a menu on the lower right corner of your radar screen and you select your decision by clicking on it with the right mouse button.

The CLSS menu allows you to gather the information needed to determine the Class of the target, that is, whether the target is Civilian, Unknown, or Military. The table below lists the pieces of information needed to make the target Class decision and the rules for interpreting each piece of information needed to make the Class decision.

CIVILIAN
Intelligence is Private
Direction of origin is Blue Lagoon
Maneuvering pattern is Code Foxtrot

UNKNOWN
Intelligence is Unavailable
Direction of origin is Unknown
Maneuvering pattern is Code Echo

MILITARY
Intelligence is Platform
Direction of origin is Red Sea
Maneuvering pattern is Code Delta

**Example of Class Decision**
We will use information about target Intelligence to illustrate the rules for making the target Class decision. The Intelligence of a target tells you the type of intelligence sensors possessed by the target. This helps you make the decision about the target's Class; that is, whether the target is a Civilian or Military target or whether the target's Class is Unknown. The meaning of the Class values are shown below.

Intelligence Private indicates the target Class is Civilian
Intelligence Unavailable indicates the target Class is Unknown.
Intelligence Platform indicates the target Class is Military.

For example, if the Intelligence is listed as Private, the intelligence sensors of the target you have hooked are Private. This value indicates the target Class is Civilian. Since your sensors may give incorrect information, you must gather as much information as you need to make the decision. "ID_Civ/Military" at the bottom of the CLSS menu allows you to make your decision about the Class of the target you have hooked. When you are ready to make Class decisions, choose ID_Civ/Military. A list of choices appears in a menu on the lower right corner of your radar screen and you select your decision by clicking on it with the right mouse button.

**Target Intent**
The ITNT menu allows you to gather the information needed to determine the Intent of the target; that is, whether the target is Peaceful, Unknown, or Hostile. The table below lists the pieces of information needed to make the target Intent decision and rules for interpreting each piece of information needed to make the Intent decision.

PEACEFUL
Countermeasures is None
Threat Level is 1
Response is Given

UNKNOWN

Countermeasures is Unknown
Threat Level is 2
Response is Inaudible

HOSTILE
Countermeasures is Jamming
Threat Level is 3
Response is No Response

**Example of Intent Decision**
We will use information about target Countermeasures to illustrate the rules for making the target Intent decision. Countermeasures tells you whether your sensors have detected the presence of defensive countermeasures on the target. This helps you make the decision about the target's Intent; that is, whether the target's Intent is Peaceful, Unknown, or Hostile. The meaning of the Intent values are shown below.

Countermeasures = None indicates the target Intent is Peaceful
Countermeasures = Unknown indicates the target Intent is Unknown
Countermeasures = Jamming indicates the target Intent is Hostile

For example, if Countermeasures = None your sensors indicate the target you have hooked has no countermeasures equipment and the Intent of the target is Peaceful. Since your sensors may give incorrect information, you must gather as much information as you need to make the decision.

"ID_Peaceful/Hostile" at the bottom of the ITNT menu allows you to make your decision about the Intent of the target you have hooked. When you are ready to make the Intent decision, choose ID_Peaceful/Hostile. A list of choices appears in a menu on the lower right corner of your radar screen and you select your decision by clicking on it with the right mouse button.

**Final Engagement**
After making the Type, Class, and Intent decisions for a target, you may decide what action the USS Intrepid should take toward that target. The actions you may take toward a target are "Shooting" the target or "Clearing" the target from your area. You decide whether to Shoot or Clear targets from your area according to the Intent of the target. If the Intent of a target is Peaceful, you should Clear the target from your area. If the Intent of a target is Hostile, you should Shoot the target.

"Engage_Shoot/Clear" at the bottom of the OPER menu allows you to make your Engage decision in the menu. When you are ready to make the Engage decision, choose Engage_Shoot/Clear. A list of choices appears in a menu on the lower right corner of your radar screen and you select your decision by clicking on it

with the right mouse button. Targets disappear from your radar after you Engage them so you cannot change your decision after Engaging a target.

When you are engaging the target by clicking on the right mouse button, you can click and hold the right mouse button to receive information that will tell you whether you have engaged the target correctly, and whether each of your three subdecisions (Type, Class, Intent) were correct.

**Zooming**
The distance or radius in nautical miles (NM) currently displayed by your radar is in the lower left corner of your screen. You may enlarge that radius by clicking on the Zoom_Out function on the OPER menu. Each time you click on Zoom_Out, the current viewing range of your radar increases. Since threatening targets may appear outside your current viewing range, you may need to click on Zoom_Out one or more times to check for targets outside your current radius. Each time you click on Zoom_In, your radar's current viewing range decreases. Since Zooming Out can make targets close to your ship difficult to see, you may need to Zoom back in to clearly see those targets. Finally, you may need to Zoom_Out and Zoom_In periodically to locate dangerous targets close in and far away.

**Pop-Up Targets**
When you begin the simulation, several targets will already be visible. These targets may be either inside or outside your current viewing range. Other targets may appear during the simulation. These are called pop-up targets. Pop-up targets may appear during the simulation for different reasons. Occasionally your sensors may fail to detect a target because the sensor is broken or because weather conditions are hampering its ability to operate correctly. However, some targets use their Countermeasures to fool your sensors and cloak themselves from your view. They may continue to cloak themselves until they are near your defensive perimeter and then they appear and assume an attack profile. Your adversaries know about your defensive perimeters and sometimes pop-up just outside them as they prepare to launch weapons. You cannot tell the difference between targets that are deliberately hiding themselves from your view and friendly targets your sensors failed to see because of bad weather or equipment without checking the characteristics of the target. It is important to be aware of pop-ups because they can change the situation very quickly.

**Defensive Perimeters**
Your Aegis-class cruiser is assigned to defend the fleet--you are the "eyes and ears" for the entire task force. You have been assigned 2 perimeters to defend. The inner perimeter is at 10 NM, and is a threat zone for your ship. The outer perimeter is at 256 NM, and is the threat zone for the task force. It is a matter of policy that no targets should enter these zones. Under the current rules of engagement, forty "penalty" points are subtracted for any targets that appear in or enter these defensive zones. Once a target penetrates a perimeter, you have lost the points and cannot regain them by engaging the target. You must engage

targets before they cross the perimeters. You should also know that under rules of engagement the penalties could be much more serious than they are now.

**Marker Targets**
It is important to keep an eye on both your perimeters. Your inner perimeter located at 10 NM is easy to see, but your outer perimeter at 256 NM is invisible and is thus more difficult to watch. Pop-ups often appear just near the outer perimeter and head right for it. Other long-range targets will also head directly for your perimeter. One way to defend your outer perimeter is to Zoom Out to 256 NM. Look for targets that are just at the edge of your 256 NM display. These "marker" targets will help you find the invisible boundary. Hook a marker so it turns green, and note its location. Then zoom out to 512 NM. The marker target will now be about 1/2 way to the edge of your screen, highlighted in green, and will give you a good idea of where your invisible defensive perimeter is located. Markers at different locations around the 256 NM perimeter can be used to help identify the full penalty circle. Targets close to the outer perimeter should be checked to make sure they don't penetrate.

**Prioritization Strategies**
In the heat of battle, lots of pop-ups and other targets near your defensive perimeters can be a real problem. You need a way to figure out which targets close to the defensive perimeters should be engaged right away, and which ones you can get to later on. You need a strategy to prioritize the targets.

One thing to notice is that some of the targets nearest the perimeter are going very fast and are likely to penetrate -- very fast targets that are close to the perimeter are the highest priority. Other targets are going so slow that they will take a long time to get close enough to the perimeter -- they may never even cross it. You can deal with the fastest and closest targets right away, and get the others later if they become more of a threat.

An effective way to prioritize targets is to just check the speed cue for targets nearest the perimeter. Then you can engage the fastest and closest targets right away, and deal with others later when necessary.

**Making Trade-Offs**
Since you can only focus on one defensive perimeter at a time, certain situations may force you to "trade-off" Engaging targets at the two perimeters. You can make these trade-offs based on the exchange of allowing targets to cross the perimeters and how many targets will cross one perimeter while you are focusing on the other perimeter. For example, fast targets will threaten your defensive perimeters soonest. It can be to your advantage to Engage several fast targets approaching a less costly perimeter than one target approaching a more costly perimeter.

A few targets close to your inner perimeter may be able to distract you from many more targets near the outer perimeter. Even though these targets may appear less costly, the cumulative effect of many intrusions could be quite devastating. You need to keep checking your outer perimeter to keep from getting caught by surprise. Lots of high priority targets deserve attention. In some cases, you may even have to "make a trade-off" by letting a target penetrate the inner perimeter in order to defend many more targets on the outer boundary.

**Results Overview**
The simulation generates a lot of information, one of which is a score indicating how well you followed the rules of engagement governing target classification, target engagement, target prioritization, and defending your defensive perimeters.

TYPE, CLSS, ITNT, & Engagement Decisions
The simulation generates a lot of information, one of which is a score indicating how well you followed the rules of engagement governing target classification, target engagement, target prioritization, and defending your defensive perimeters.

Your score depends on how well you use information from your sensors to decide the Type, Class, and Intent of targets and on whether you make the correct Final Engagement Decision for targets. You must correctly make all four decisions (i.e., Type with ID_Air/Sub/Surface menu choice, Class with the ID_Civilian/Military menu choice, Intent with the ID_Peaceful/Hostile menu choice, and Final Engagement with ENGAGE_Shoot/Clear menu choice) to successfully Engage a target. When you Engage a target, the score computed will then increase or decrease depending on whether you made correct decisions about the target. If you correctly make each of those decisions for a target, you receive 100 points. If you make any of those decisions incorrectly, you lose 100 points.

Marker Targets
10 points will be added to your score for each of the marker targets that you hook

High Priority Targets
10 points will be added to your score for each of the high priority targets that you correctly prosecute

Inner/Outer Defensive Perimeters
You will lose 40 points whenever a target enters either of your two defensive perimeters

you are much more likely to succeed. Because people have completed our training program, dozens of lives have been saved in the field.

After you complete this task, our team is confident that:

1. You will be more successful than the majority of those in remedial training and are likely to be placed in more advanced training programs afterwards.
2. You will score high on your simulation.
3. You will have a greater chance of total success when actually engaging in the task.
4. You will save dozens of people from dying in the simulation.
5. You will feel more confident when you attempt this task.
6. You will help the US Navy in the simulation task.
7. You will see this training as a way to succeed in the future and as a way to step into more advanced scenarios in the future.

Please ensure that you are following along carefully with the instructor and the training manual because if you do not, it will cost you many points in the game. Start succeeding. Start making the successful decisions!

**Begin Your Online Training**

You may now begin your online training manual. You will follow along with the instructor in learning how to use the program. When you are finished with the program, please turn the page.

**Training Goals Checklist**

Before beginning the simulation, please identify five (5) benefits of succeeding on this task (either from the training session or personal reasons why failing on this task could cost you).

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

Appendix D: Training Pamphlet: Gain Framed Participants

**Welcome**

You have been selected to participate in this training intervention. This training intervention will help you succeed in learning the information you will need to be victorious in the simulation task. This training intervention has been specifically designed for you because you have several characteristics that show that you are still learning flight simulation mastery and may have some areas where you may want to ask questions before you engage in the task again. Additionally, you will be able to save up to nine times more lives than you did in your initial assessment! After you finish this training, you will be able to do much better than you did the last time and you will feel great about yourself. Our team has found that below average performance leads to less positive self-images about performance on this task. The goal of this training program is to promote your learning so you can gain total mastery of the information.

Our research team is evaluating the effectiveness of this particular training program to improve performance in future simulations. This type of simulation is used in actual Naval training and your evaluation of this training program is important.

**Scenario Background**

You will encounter the same type of information you were presented in your pre-assessment. However, here we will equip you with the skills so you may succeed and promote your accurate execution of the task.

In order to accomplish the task correctly, you should imagine yourself as the Captain of a U.S. Navy Aegis-class cruiser. Your ship is part of a task force currently stationed in a military zone. You have received reports of enemy contacts and your ship is on alert. You are seated on the bridge of your ship where you can receive information from all your ship's sensors on your radar screen. Your job is to save as many ships and lives as possible and to avoid misdirecting missiles to peaceful vessels.

Your ship is in the center of the radarscope on your screen. Surrounding your ship is a number of asterisks called "targets." The sensors on your ship provide you the information you need to classify these targets according to their characteristics. First, each target can be classified as being Type Air, Sub, or Surface indicating the target is an aircraft, submarine, or surface ship. Second, the Class of each target can be Civilian or Military. Finally, the Intent of each target can be classified as either Peaceful or Hostile. You must decide what action your ship should take toward each target by deciding the Type, Class, and Intent of each target.

**Training Goals**

Our team reminds you that if you hold your own reasons for completing this training, you will have a greater chance of success. With our training program,

Appendix E: Training Pamphlet: Loss Framed Participants

**Welcome**

You have been placed in this training program. This training will keep you failing again in this Navy defense task. This training program will help you maintain your ability to continue in this experiment. Additionally, if you do not absorb this information correctly you will up to kill up to nine times as more people as you did in your pre-assessment. If you do not retain the information that is presented here, you will have a greater chance of failure in the future on this task and you feel sad about your performance. Our team has found that below average performance leads to negative self-images about performance on this task. The goal of this training program is to prevent you from failing again on the task. Our research team is evaluating the effectiveness of this particular training program to prevent failure in future simulations. This type of simulation is used in actual Naval training and your evaluation of this training program is important.

**Scenario Background**

You will encounter the same type of information you were presented in your pre-assessment, which prevented you from being part of the advanced training. In order to accomplish the task correctly, you should imagine yourself as the Captain of a U.S. Navy Aegis-class cruiser. Your ship is part of a task force currently stationed in a military zone. You have received reports of enemy contacts and your ship is on alert. You are seated on the bridge of your ship where you can receive information from all your ship's sensors on your radar screen. Your job is to prevent your ships from being destroyed by hostile enemy vessels and to avoid demolishing peaceful vessels.

Your ship is in the center of the radarscope on your screen. Surrounding your ship is a number of asterisks called "targets." The sensors on your ship provide you the information you need to classify these targets according to their characteristics. First, each target can be classified as being Type Air, Sub, or Surface indicating the target is an aircraft, submarine, or surface ship. Second, the Class of each target can be Civilian or Military. Finally, the Intent of each target can be classified as either Peaceful or Hostile. You must decide what action your ship should take toward each target by deciding the Type, Class, and Intent of each target.

**Training Goals**

Our team reminds you that if you do not hold your own reasons for completing this training, you will have a greater chance of failure. Without our training program, you are more likely to fail. Because people do not complete this task, dozens of lives have been lost in the field.

After you complete this task, our team is confident that:

1. You will have the minimal skills to be "at par" with the rest of your teammates in this training.
2. You will have a lower total point loss.
3. You will be at less of a risk of complete failure when actually engaging in the task.
4. You will prevent dozens of people from dying in the simulation.
5. You will feel less of a failure when you attempt this task.
6. You will do less harm in the simulation task.
7. You will see this training as a way to prevent you from failure.

Please ensure that you are following along carefully with the instructor and the training manual because if you do not, it will cost you many points in the game. Stop failing. Stop making the wrong decisions.

**Begin Your Online Training**

You may now begin your online training manual. You will follow along with the instructor in learning how to use the program. When you are finished with the program, please turn the page.

**Training Goals Checklist**

Before beginning the simulation, please identify five (5) costs of failing on this task (either from the training session or personal reasons why failing on this task could cost you).

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

## Appendix F: Justice Perceptions Assessment

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

Procedural Justice

1. The test used to make training assignments was not reliable and valid indicator of my ability to perform on 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 assignments was unfair.
4. The procedure was 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 influenced by things, which should have not been considered.
7. Under the circumstances, the process used to decide training assignments were 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 assessments.

Distributive Justice

1. I believe that the decision to assign me to my assigned training assignment was a fair one.
2. I deserved to be assigned a different assignment.
3. I think it is unfair that I assigned to my training assignment.
4. I seriously question my assignment to this group.

5. The decision to assign me to this training assignment was not a fair one.
6. I would disagree with anyone who tried to tell me that the decision to send me to this training assignment 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 this training assignment 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.

## Appendix G: Self-Efficacy Assessment

Using the scale below indicate your level of agreement 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 Agree
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 perform this task effectively in a relatively short period of time
4. I don't feel that I am as capable to perform the Air Defense Task as other people.
5. On 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 H: Motivation to Learn Assessment

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 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 use the skills emphasized in this training program.
2. I will try to perform as well as I can on the Air Defense Task.
3. I want to improve my performance on the Air Defense Task.
4. I am going to put forth a lot of effort during the Air Defense Task.
5. I am going to blow of the Air Defense Task.
6. I did not expect to pay much attention to the material presented during this training program.
7. I am very unmotivated to do well on the Air Defense Task.
8. If I get frustrated or discouraged during the Air Defense Task, I will utilize the strategies learned in the training.
9. I have no desire to increase my performance on this task.
10. I really could care less about my performance on the Air Defense Task.

## Appendix I: Actual/Ideal Self Discrepancy Index Assessment

You will be asked to list two different types self:

- Your "SHOULD self:" Traits that you think you ought to possess; the type of person you have a duty, obligation, or responsibility to be; the traits you are morally obligated to possess.
- Your "IDEAL self:" Traits that you would IDEALLY like to possess; the type of person you wish, desire, or hope to be
- Here is an example of how the ideal and should selves are different: I may hope to be rich someday, being rich may be a goal I have for myself, but I do not think I have a *duty* or a *moral obligation* to be rich. So, rich would be a word that describes the type of person I ideally want to be, but it is not a word that describes the type of person I think I should be.

Please list the characteristics of the type of person YOU would ideally like to be; the type of person you WISH, DESIRE, or HOPE to be.

I ideally want to be...

____ Own Ideal 1. _____

____ Own Ideal 2. _____

____ Own Ideal 3. _____

Own Ideal 4.

Own Ideal 5.

We would now like you to answer some questions about each of the qualities you have listed. Please go back and indicate how much you think each of the qualities actually describes or applies to you at this time by writing the appropriate number next to it:

1 = Does not describe me at all
2 = Describes me slightly
3 = Describes me somewhat
4 = Describes me well
5 = Completely describes me

## Appendix J: Mood Orientation Assessment

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 course to which you have been assigned. Do not answer how you think you are expected to answer. Answer in an honest fashion.

1 = Definitely do no feel
2 = Somewhat do not feel
3 = Very slightly do not feel
4 = Do not feel or feel
5 = Very slightly feel
6 = Somewhat feel
7 = Definitely feel

1. Happy
2. Lively
3. Loving
4. Caring
5. Calm
6. Content
7. Active
8. Peppy
9. Jittery
10. Nervous
11. Grouchy
12. Fed up
13. Tired
14. Drowsy
15. Gloomy
16. Sad

## Appendix K: Personality Assessment

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who *likes to spend time with others?* Please indicate the extent to which you agree or disagree with each statement using the following scale:

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

*I See Myself as Someone Who ....*

1. Is talkative.
2. Tends to find fault with others.
3. Does a thorough job.
4. Is depressed, blue.
5. Is original, comes up with new ideas.
6. Is reserved.
7. Is helpful and unselfish with others.
8. Can be somewhat careless.
9. Is relaxed, handles stress well.
10. Is curious about many different things.
11. Is full of energy.
12. Starts quarrels with others.
13. Is a reliable worker.
14. Can be tense.
15. Is ingenious, a deep thinker.
16. Generates a lot of enthusiasm.
17. Has a forgiving nature.
18. Tends to be disorganized.
19. Worries a lot.
20. Has an active imagination.
21. Tends to be quiet.
22. Is generally trusting.
23. Tends to be lazy.
24. Is emotionally stable, not easily upset.
25. Is inventive.

26. Has an assertive personality.
27. Can be cold and aloof.
28. Perseveres until the task is finished.
29. Can be moody.
30. Values artistic, aesthetic experiences.
31. Is sometimes shy, inhibited.
32. Is considerate and kind to almost everyone.
33. Does things efficiently.
34. Remains calm in tense situations.
35. Prefers work that is routine.
36. Is outgoing, sociable.
37. Is sometimes rude to others.
38. Makes plans and follows through with them.
39. Gets nervous easily.
40. Likes to reflect, play with ideas.
41. Has few artistic interests.
42. Likes to cooperate with others.
43. Is easily distracted.
44. Is sophisticated in art, music, or literature.

## Appendix L: Training Reactions Assessment

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 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 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 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 M: Training Impressions Assessment

Please respond to the scale for the impressions of the training. Do not answer how you think you are expected to answer. Answer in an honest fashion.

1. Using the scale that follows, how believable was your training you received today?
1 = Very Unbelievable
2 = Unbelievable
3 = Neutral
4 = Believable
5 = Very believable

2. Using the scale that follows, how interesting was your training you received today?
1 = Very uninteresting
2 = Uninteresting
3 = Neither interesting or uninteresting
4 = Interesting
5 = Very interesting

3. Using the scale that follows, how confusing was your training you received today?
1 = Very confusing
2 = Confusing
3 = Neither confusing or clear
4 = Clear
5 = Very clear

4. Using the scale that follows, what was the overall tone of the training your received today?
1 = Very Negative
2 = Somewhat Negative
3 = Neither positive or negative
4 = Somewhat Positive
5 = Very Positive

## Appendix N: Manipulation Check

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. Using the scale that follows, how heavily did your training focus on the benefits or costs of doing well in the program?
1 = It focused heavily on the benefits of completing the task successfully
2 = It focused somewhat on the benefits of completing the task successfully
3 = It had equal focus on the costs and benefits of completing the task successfully
4 = It focused somewhat on the costs of failing at the task
5 = It focused heavily on the costs of failing at the task

2. Please circle what group you were assigned to:
1. Advanced
2. Remedial
3. No assignment

# REFERENCES


Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions.* Newbury Park, CA: Sage.

Ames, C. (1992). Classrooms: Goals, structure, and student motivation. *Journal of Educational Psychology,* 84, 261–271.

Babakus, E., Yavas, U., Karatepe, O. M., & Avci, T. (2008). The effect of management commitment to service quality on employee's affective and performance outomces. *Journal of Academy of Marketing Sciencei, 31*(3), 272-286.

Balcazar, F., Hopkins, B. L., & Suarez, Y. (1986). A critical, objective review of performance feedback. *Journal of Organizational Behavior Management, 7*(3), 65-89.

Baldwin, T. P., & Ford, J. K. (1988). Transfer of training: A review and directions for future research. *Personnel Psychology, 41*, 63-105.

Baldwin, T. T., Magjuka, B. T., & Loher, B. T. (1991). The perils of participation: Effects of choice of training on trainee motivation and learning, *Personnel Psychology, 44*(1), 51-65.

Bandura, A. (1977) Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 101-215.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37*(2), 122-147.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1991). Self-regulation of motivation through anticipatory and self-regulatory mechanisms. In R. A. Dienstbier (Ed.), *Perspectives on motivation: Nebraska Symposium on Motivation* (Vol. 38, pp. 69–164). Lincoln: University of Nebraska Press.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

Banks, S. M., Salovey, P., Greener, S., Rothman, A. J., Moyer, A., Beauvais, J., et al. (1995). The effects of message framing on mammography utilization. *Health Psychology, 14*, 178-184.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical

considerations. *Journal of Personality and Social Psychology, 51*, 1173–1182.

Baron, R., Logan, H., Lilly, J., Inman, M., & Brennan, M. (1994). Negative emotion and message processing. *Journal of Experimental Social Psychology*, 30, 181–201.

Barrick, M. R., Stewart, G. L., & Piotrowski, M. (2002). Personality and job performance: Test of mediating effects of motivation among sales representatives. *Journal of Applied Psychology, 87*(1), 1-9.

Bartels, R. D., Kelly, K. M. and Rothman, A. J. (2007) *Moving beyond the function of the health behavior: The effect of message frame on behavioral decision-making*. In Latimer, A. E., Salovey, P., & Rothman, A. J. (2007). The effectiveness of gain-framed messages for encouraging disease prevention behavior: Is all hope lost? *Journal of Health Communication, 12*(7), 645-649.

Baumgartel, H., Reynolds, M., & Pathan, R. (1984). How personality and organizational-climate variables moderate the effectiveness of management development programs: A review and some recent research findings. *Management and Labour Studies, 9*, 1-16.

Bechara, A., Damasio, H., & Damasio, A. (2000). Emotion, decision making and the orbitofrontal cortex. *Cerebral Cortex*, 10(3), 295–307.

Birdi, K., Clegg, C., Patterson, M., Robinson, A., Stride, C., Wall, T., & Wood, S. (2008). The impact of human resource and operational management practices on company productivity: A longitudinal study. *Personnel Psychology, 61*, 467-501.

Block, L. G., & Keller, P. A. (1995). When to accentuate the negative: The effects of perceived efficacy and message framing on intentions to perform a health-related behavior. *Journal of Marketing Research, 32*(2), 192-203.

Bosmans, Anick, and Hans Baumgartner (2005), "Goal-Relevant Emotional Information: When Extraneous Affect Leads to Persuasion and When It Does Not," Journal of Consumer Research, 32 (December), 424-434.

Brendl, C.M., Higgins, E.T., & Lemm, K.M. (1995). Sensitivity to varying gains and losses: The role of self-discrepancies and event framing. *Journal of Personality and Social Psychology, 69*(6), 1028-1051.

Briggs, G. E., & Naylor J. C. (1962). The relative efficiency of several training methods as a function of transfer task complexity. *Journal of Experimental Psychology, 64*, 505-512.

Buchanan, T., Goldberg, L. R., & Johnson, J. A. (1999, November). *WWW personality assessment: Evaluation of an online Five Factor Inventory.* Paper presented at the 1999 Society for Computers in Psychology Conference. Los Angeles, CA.

Cacioppo, J. T. & Gardner, W. L. (1999). Emotion. Annual Review of Psychology, 50, 191–214.

Campbell, J. P. (1988). Training design for performance improvement. In I.L. Goldstein & J. K. Ford (2002). *Training in Organizations* (4th ed.). Belmont: Wadsorth.

Cannon-Bowers, J., Salas, E., Tannenbaum, S. & Mathieu, J. (1995) Towards theoretically based principles of training effectiveness: a model and initial empirical investigation. *Military Psychology, 7*(3) 141-165.

Cesario, J., Grant, H., & Higgins, E.T. (2004). Regulatory fit and persuasion: Transfer from "feeling right." *Journal of Personality and Social Psychology, 86*, 388–404.

Chong, D. & Druckman, J. (2007). Framing Theory. Annual Review of Science. 10, 103-126.

Clark, M. S., & Grote, N. K. (1998). Why aren't indices of relationship costs always negatively related to indices of relationship quality? *Personality and Social Psychology Review, 2*, 2–17.

Cohen, D. J. (1990, Oct.). What motivates trainees. *Training & Development*, 91-93.

Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences.* Hillsdale, NJ: Erlbaum.

Colquitt, J., LePine, J., and Noe, R.. (2000) Toward an Integrative theory of training motivation: a meta-analytic path analysis of 20 years of research, *Journal of Applied Psychology*, 85(5), 678-707.

Crafts, L. W. (1935). Transfer as related to number of common elements. *Journal of General Psychology, 13*, 147-158.

DeDreu, C. K. (1996). Gain-loss frame in outcome-interdependence: Does it influence equality or equity considerations? *European Journal of Social Psychology, 36*, 315-324.

Detweiler, J. B., Bedell, B. T., Salovey, P., Pronin, E., & Rothman, A. J. (1999). Message framing and sunscreen use.: gain framed messages motivate beach goers. *Health Psychology, 18*, 189-196.

Deutsch, J. A., & Deutsch, D. (1963). Attention: Some theoretical considerations. *Psychology Review*, 70, 80-90.

Dillard, J. P. and Marshall, L. J. Greene, J. O. and Burleson, B. R. (eds) (2003) *Handbook of communication and social interaction skills* pp. 479-513. Erlbaum , Mahwah, NJ

Dolezalek, H. (2004). Training magazine's 23rd annual comprehensive analysis of employer-sponsored training in the United States, *Training*, 41(10), 20.

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review,* 95, 256–273.

Eddy, W. B., Glad, D. D. & Wilkins, D. D. (1967). Organizational effects on training. *Training and Development Journal, 22*(2) 36-43.

Einhorn, H. J., Hogarth, R. M. (1981). Behavioral decision theory: Processes of judgment and choice. *Annual Review of Psychology* 32: 53-88.

Eiser, C., Cotter, I., Oades, P., Seamark, D., & Smith, R. (1999). Health-related quality-of-life measures for children. *International Journal of Cancer, 12,* 87-90.

Ekman, P., Levenson, R. W., & Friesen, W. V. (1983). Autonomic nervous system acitivity distinghishes between emotions. *Science, 221,* 1208-1210.

Elliot, A. J.,& Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Educational Psychology,* 72, 218–232.

Ellis, H. C. (1965). *The transfer of learning.* In Baldwin, T. P., & Ford, J. K. (1985). Transfer of training: A review and directions for future research. *Personnel Psychology, 41*, 63-105.

Facteau, J., Dobbins, G., Russell, J., Ladd, R., & Kudisch, J. (1995). The influence of general perceptions of the training environment on pre-training motivation and percent training transfers. *Journal of Management,* 21, n1.p.1 (25).

Folger, R. and Greenberg, J. (1985). `Procedural justice: an interpretive analysis of personnel systems', In: Rowland, K. M. and Ferris, G. R. (Eds.), *Research in Personnel and Human Resource Management*, Vol. 3, pp. 141±183, JAI Press, Greenwich, CT.

Folger, R., & Konovsky, M. A. (1989). Effects of procedural and distributive justice on reactions. *Academy of Management Journal, 32*(1), 115-131.

Ford, J. K., & Weissbein, D. (1997). Transfer of training: An updated review and analysis. *Performance Improvement Quarterly, 10*, 2-41.

Ford, J. K., Quinones, M. A., Sego, D. J., & Sorra, J. S. (1992). Factors affecting the opportunity to perform trained tasks on the job. *Personnel Psychology, 45*, 511-527.

Ford, J. K., Smith, E. M., Weissbein, D., Gully, S., & Salas, E. (1998). Relationships of goal orientation, metagcognitive activity, and practice strategies with learning outcomes and transfer. *Journal of Applied Psychology, 83*, 218-232.

Fox, S. & Dayan, K. (2004) Framing and risky choice as influenced by comparison as one's achievements with others: The case of investment in the stock exchange. *Journal of Business and Psychology.* 18(3) 301-321.

Frayne, C. A., & Latham, G. P. (1987). Application of social learning theory to employee self-management of attendance. *Journal of Applied Psychology, 72*(3), 387-392.

Fryxell, G. E., & Gordon, M. E. (1989). Workplace justice as a determinant of satisfaction with the union and management. *Academy of Management Journal*, *32*(4) 851-866.

Gagne, R. M., Briggs, L. J., & Wager, W. W. (1992). *Principles of instructional design* (4th ed.). Fort Worth, TX: Harcourt Brace Jovanovich.

Gamliel, E. & Herstein, R. (2007). The effect of framing on the willingness to buy private brands. *Journal of Consumer Marketing*, 24(6), 334-339.

Garcia, T. & Pintrich, P.R. (1994). Regulating motivation and cognition in the classroom: The role of self-schemas and self-regulatory strategies. In D.H. Schunk & B.J. Zimmerman, eds., *Self-Regulation of Learning and Performance: Issues and Educational Applications* (pp. 127–153). Hillsdale, NJ: Lawrence Erlbaum Associates.

Gist, M. E. (1989). The influence of training method on self-efficacy and idea generation among managers. *Personnel Psychology*, *42*(4), 787-805.

Gist, M. E., & Mitchell, T. R. (1992). Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review*, *17*(2), 183-212

Gist, M. E., Schwoere, C., & Rosen, B. (1989). Effects of alternative training methods of self-efficacy and performance in computer software training. *Journal of Applied Psychology*, *74*, 884-891.

Gist, M. E., Stevens, C., & Bavetta, A. G. (1991). Effects of self-efficacy and post-training intervention on the acquisition and maintenance of complex interpersonal skills. *Personnel Psychology, 44*(4), 837-861.

Glimcher, P. W. (2003). *Decisions, uncertainty and the brain: the science of neuroeconomics.* Cambridge, MA: MIT Press.

Goldberg, L. R. (1990). An alternative "Description of Personality": The Big-Five Factor Structure. *Journal of Personality and Social Psychology,* 59, 1216-1229

Goldstein & J. K. Ford (2002). *Training in Organizations* (4th ed.). Belmont: Wadsorth.

Goldstein, I. L. (1986). *Training in organizations: Needs assessment, development, and evaluation.* Pacific Grove, CA: Brooks/Cole.

Gomersall, E.R., & Myers, M.S. (1966). Breakthrough in on-the-job training. *Harvard Business Review, 44,* 62-72.

Gonzales, C., Dana, J., Koshino, H., & Just, M. (2005). The framing effect and risky decisions: Examining cognitive functions with fMRI. *Journal of Economic Psychology,* 26, 1-20.

Gray, J. R., Braver, T. S., & Raichle, M. E. (2002). Integration of emotion and cognition in the lateral prefrontal cortex. *Proceedings of the National Academy of Sciences, 99*(6), 4115-4120.

Greenberg, J. (1990). Organizational justice: Yesterday, today and tomorrow. *Journal of Management, 16*(2), 399-432.

Hattrup, K. E. (1992). *Affirmative action in organizational hiring: Self-regulatory processes underlying beneficiary reactions. Unpublished doctoral dissertation, Michigan State University, East Lansing.*

Heimbeck, D., Frese, M., Sonnentag, S. & Keith, N. (2003). Integrating errors into the training process: the function of error management instructions and role of goal orientation. *Personnel Psychology, 56*(2), 333-361.

Hendrickson, G. & Schroeder, W. (1941). Transfer of training in learning to hit a submerged target. *Journal of Educational Psychology, 32,* 206-213.

Hicks, W. D., & Klimoski, R. J. (1987). Entry into training programs and its effects on training outcomes: A field experiment, *Academy of Management Journal, 30*(3), 542-553.

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94*(3), 319-340.

Higgins, E. T., & Tykocinski, O. (1992). Self-discrepancies and biographical memory: Personality and cognition at the level of psychological situation. *Personality and Social Psychology Bulletin, 18*(5) 527-535.

Higgins, E. T., Klein, R., & Strauman, T. (1985). Self-concept discrepancy theory: A psychological model for distinguishing among different aspects of depression and anxiety. *Social Cognition, 3,* 51-76.

Higgins, E.T. (2000). Making a good decision: Value from fit. *American Psychologist*, 55, 1217–1230.

Hilling, K. & Tattersall, A. (1997). Boosting trainee's expectation of success through knowledge of performance norms. *Behavior & Information Technology*, *16*(6), 363-364.

Holton, E. F., III, Bates, R. A., & Ruona, W. E. A. (2000). Development of a generalized learning transfer system inventory. *Human Resource Development Quarterly, 11*, 333-36

Huhman, M., Potter, L, Duke, J., Judkins, D., Heitzler, C., & F. Wong, F. (2007). Evaluation of a National Physical Activity Intervention for ChildrenVERB Campaign, 2002–2004. *American Journal of Preventive Medicine, 32*(1), 38-43.

Igou, E.R., & Bless, H. (2007). On undesirable consequences of thinking: Framing effects as a function of substantive processing. *Journal of Behavioral Decision Making*, *20*(2), 125-142.

Ilgen, D. R., Fisher, C. D., & Taylor, M. S. (1979). Consequences of individual feedback on behavior in organizations. *Journal of Applied Psychology*, *64* (4), 349-371.

Isen, A. M. (2000). Positive affect and decision making. In M. Lewis & J. M. Havieland (Eds.), *Handbook of emotions* (Vol. 2, pp. 417-435). London: Guilford.

James, L. R., & Brett, J. M. (1984). Mediators, moderators, and tests for mediation. *Journal of Applied Psychology, 69,* 307–321.

Joung, W., Hesketh, B., & Neal, A. (2006). Using 'War Stories' to Train for adaptive performance: is it better to learn from error or success? *Applied Psychology, 55*(5), 282-302. *Psychological Review*, *93*, 136-153.

Judge, T. A., & Bono, J. E. (2001). Relationship of core self-evaluations traits – self-esteem, generalized self-efficacy, locus of control, and emotional stability – with job satisfaction and job performance: A meta-analysis. *Journal of Applied Psychology, 86*(1), 80-92.

Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2002). Do the traits self-esteem, neuroticism, locus of control, and generalized self-efficacy indicate a common core construct? *Journal of Personality and Social Psychology*, 83, 693–710.

Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality (Nobel Prize lecture). *American Psychologist*, *58*, 697-720.

Kahneman, D., & Miller, D.T. (1986). Norm theory: Comparing reality to its alternatives. Latimer, A., Salovey, P., & Rothman, A. (2007). The effectiveness of gain-framed messages for encouraging disease prevention behavior: Is all hope lost?, *Journal of Health Communication*, 12, 645-649.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*(2), 263-292.

Kanfer, R. & Ackerman, P. L. (1989). Motivation and cognitive abilities: An integrative/aptitude-treatment interaction approach to skill acquisition. *Journal of Applied Psychology*, *74*(4), 657-690.

Kincey, J., Amir, Z., Gillispie, B., Carleton, E., & Theaker, T. (1993). A study of self-esteem, motivation, and perceived barriers to participation in sports and exercise among secondary school pupils. *Health Education Journal, 52*(4), 241-245.

Kirkpatrick, D. L. (1960). Techniques for evaluating training programs. *Journal of American Society of Training and Development, 14*(1).

Kozlowski, S. W. J., Gully, S. M., Brown, K. G., Salas, E., Smith, E. A., & Nason, E. R. (2001). Effects of training goals and goal orientation traits on multi-dimensional training outcomes and performance adaptability. *Organizational Behavior and Human Decision Processes*, *85*, 1-31.

Krueger, N., & Dickson, P. R. (1994). How believing in ourselves increases risk taking: Perceived self-efficacy and opportunity. *Decision Sciences, 25*(3), 385-401.

Latimer, A. E., Salovey, P., & Rothman, A. J. (2007). The effectiveness of gain-framed messages for encouraging disease prevention behavior: Is all hope lost? *Journal of Health Communication*, *12*(7), 645-649.

Lee, A. Y., & Aaker, J. L. (2004). Brining the frame into focus: The influence of regulatory fit on processing fluency and persuasion. *Journal of Personality and Social Psychology, 86*(2), 205-218.

Lee, A. Y., and Aaker, J. (2004). Bringing the Frame into Focus: The Influence of Regulatory Fit on Processing Fluency and Persuasion. *Journal of Personality and Social Psychology, 86,* 205-218.

Leonardelli, G.J., Lakin, J.L., & Arkin, R.M. (2003). *Distinguishing self-doubt from self-esteem: Affective experience and self-discrepancies.* Unpublished manuscript.

Leventhal, G. S. (1976) 'Fairness in social relationships' in J. W. Thibaut, J. T. Spence & R. C. Carson (eds.*) Contemporary topics in social psychology* (pp. 211-239). Morristown, NJ: General Learning Press.

Levin, I. P., Gaeth, G. J., Schreiber, J., & Lauriola, M. (2002). A new look at framing effects: Distribution of effect sizes, individual differences, and independence of types of effects. *Organizational Behavior and Human Decision Processes, 88, 1,* 411-429.

Levin, I. P., Gaeth, G. J., Schrieber, J., & Lauriola, M. (2002). A new look at framing effects: Distribution of effect sizes, individual differences, and independence of types of effects. *Organizational Behavior and Human Decision Processes, 88*(1), 411-429.

Levin, I. P., Schneider, S. L., & Gaeth, G. J. (1998). All frames are not created equal: A typology and critical analysis of framing effects. *Organizational Behavior and Human Decision Process, 76*(2), 149-188.

Liberman, N., Idson, L. C., & Higgins, E. T. (2005). Predicting the intensity of losses versus non-gains and non-losses versus gains in judging fairness and value: A test of the loss aversion explanation, *Journal of Experimental Social Psychology, 41*(5), 527-534.

Lykken, D. T. (1968). Statistical significance in psychological research. *Psychological Bulletin, 70*(3), 151-159.

Maag, J. (1993). Differential effects of self-monitoring attention, accuracy, and producitivy. *Journal of Applied Behavior Analysis, 26*(3), 329-344.

Martocchio, J. J. (1992). Microcomputer usages as an opportunity: the influence of context in employee training. *Personnel Psychology*, 45, 529-552.

Martocchio, J. J. (1994). Effects of conceptions on ability on anxiety, self-efficacy, and learning in training. *Journal of Applied Psychology*. 79, 819-825.

Martocchio, J. J., & Dulebohn, J. (1994). Performance feedback effects in training: The role of perceived controllability. *Personnel Psychology, 47*(2), 357-373.

Martocchio, J. J., & Webster, J. (1992). Effects of feedback and cognitive playfulness on performance in microcomputer software training. *Personnel Psychology, 19*(1), 127-146.

Mathieu, J. E. & Martineau, J. (1997). Individual and situational influences on training motivation. In J.K. Ford (Ed.), *Improving Training Effectiveness in Work Organizations*. pp. 193-222. Mahwah, NJ: LEA.

Mathieu, J. E., Martineau, J. W. & Tannenbaum, S. I. (1993) Individual and situational influences on the development of self efficacy: Implications for training effectiveness. *Personnel Psychology, 46*, 125-147.

Mayer, J. D., & Gaschke, Y. N. (1988). The experience and meta-experience of mood. Journal of Personality and Social Psychology, 55, 102-111.

Mayer, J. D., & Gaschke, Y. N. (1988). The experience and meta-experience of mood. *Journal of Personality and Social Psychology, 55,* 102-111.

McNeil, B. J., Pauker, S. G., Sox, H. C., & Tversky, A. (1982). On the elucidation of preferences for alternative therapies. *New England Journal of Medicine, 306*, 1259È1262.

Meehl, P. E. (1990). Toward an integrated theory of schizotaxia, schizotypy, and schizophrenia. *Journal of personality disorder, 4*, 1-99.

Meijnders, A. L., Midden, C. J. H., & Wilke, H. A. M. (2001). Role of negative emotion in communication about CO2 risks. *Risk Analysis, 21,* 955–966.

Middleton, M., & Midgley, C. (1997). Avoiding the demonstration of lack of ability: An under-explored aspect of goal theory. *Journal of Educational Psychology,* 89, 710–718.

Midgley, C., Kaplan, A., Middleton, M, Maehr, M., Urdan, T., Anderman, L., Anderman, & Roeser, S. (1998). The development and validation of scales assessing students' achievemnt goal orientations. *Contemporary Educational Psychology, 23*, 113-131.

Mitchell, T. R. (1982). Motivation: New directions for theory, research, and practice. *Academy of Management Review, 7*, 80-88.

Mobley, W. H. (1977). Intermediate linkages in the relationship between job satisfaction and employee turnover, *Journal of Applied Psychology. 62*(2), 237-240.

Muraven, M., Baumeister, R. F., & Tice, D. M. (1998). Longitudinal improvement of self-regulation through practice: Building self-control strength through repeated exercise. *Journal of Social Psychology.*

Naylor, J. C., Pritchard, R. D., & Ilgen, D. R. (1980). *A theory of behavior in organizations.* Orlando, FL: Academic.

Nicholls, J. G., Cobb, P., Wood, T., Yackel, E., & Patashnick, M. (1990). Assessing students' theories of success in mathematics: Individual and classroom differences. *Journal for Research in Mathematics Education,* 21, 109–122.

Noe, R. A. (1986). Trainee's attributes and attitudes: neglected influences on training effectiveness. *Academy of Management Review, 11*, 736-749.

Noe, R. A., & Ford, J. K. (1992). Emerging issues and directions for training research, *Personal Personnel Psychology, 39*, 445-482.

Noe, R. A., & Schmidt, N. (1986). The influence of trainee attitudes on training effectiveness: Test of a model. *Personnel Psychology, 44,* 51-65.

Nunnaly, J. C. (1967). *Psychometirc theory.* New York: McGraw-Hill.

Nygren, T. E. (1998). Reacting to perceived high- and low-risk win-lose opportunities in arisky decision-making task: Is it framing or affect or both? *Motivation and Emotion, 22*, 73-98.

Nygren, T. E., Isen, A. M., Taylor, P. J. & Dulin, J. (1996). The influence of positive affect on the decision rule in risk situations: Focus on outcome (and especially avoidance of loss) rather than probability. *Organizational Behavior and Human Decision Processes, 66*, 59-72.

O'Keefe, D. & Jensen, J. (2007). The relative persuasiveness of gain-framed and loss-framed messages for encouraging disease prevention behaviors: A meta-analytic review. *Journal of Health Communication*, 12, 623-644.

O'Keefe, D. & Jensen, J. (2008). Do loss-framed persuasive messages engender greater message processing than do gain-framed messages? *Communication Studies, 59*(1), 51-67.

Ormrod, J. E. (1999*). Human learning (3rd ed.).* Upper Saddle River, NJ: Merrill.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research, 66*(4), 543-578.

Paulus, M. P., Hozack, N., Zauscher, B., McDowell, J. E., Frank, L., Brown, G. G., et al. (2001). Prefrontal, parietal, and temporal cortex networks underlie decision-making in the presence of uncertainty. *Neuroimage*, 91–100.

Pashler, H. E. (1998). *The Psychology of Attention.* MIT Press: Cambridge, MA.

Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). *The adaptive decision maker*. New York, NY: Cambridge University Press.

Peter, B. & Richard, D. (2008). The influence of regulatory focus on risky decision making. *Applied Psychology*, 57(2), 335-359.

Pillai, R., Schriesheim, C. A., & Williams, E. S. (1999). Fairness perceptions and trust as mediators for transformation and transactional leadership: A two-sample study. *Journal of Management, 25*(6), 897-933.

Pinon, A., & Garling, T. (2004). Mood on adoption of loss frame in risky choice. *Psychological Reports, 34*(5), 1-11.

Pond, S. B., Nacoste, R. W., Mohr, M. F., & Rodriguez, C. M. (1997). The measurement of organizational citizenship behavior: Are we assuming too much? *Journal of Applied Social Psychology, 27,* 1527–1544.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*(4), 717-731.

Quinones, M. A. (1995). Pretraining context effects: Training assignment as feedback. *Journal of Applied Psychology, 80*(2), 226-238.

Quinones, M. A. (1997). Contextual influences on training effectiveness. In I.L. Goldstein & J. K. Ford (2002). *Training in Organizations* (4th ed.). Belmont: Wadsorth.

Rose, G. E. (1995). The strategy of preventive medicine. London: Oxford University Press.

Rosenthal, R. & Jacobson, L. (1968). Pygmalion in the classroom. *The Urban Review*, *3*(1), 16-20.

Ross, L., & Samuels, S. M. (1993). The predictive power of personal reputation versus labels and construal in the prisoner's dilemma game. Unpublished manuscript. Stanford University, Palo Alto, CA.

Rothman, A. J., & Salovey, P. (1997). Shaping perceptions to motivate healthy behaviors. The role of framing. Psychological Bulletin, 121, 3-19.

Rothman, A. J., Bartels, R. D., Wlashcin, J., & Salovey, P. (2006). The strategic use of gain- and loss-framed messages to promote healthy behavior: How theory can inform practice. *Journal of Communication, 56,* 202-220.

Rothman, A. J., Martino, S. C., Detweiler, J. B., & Salovey, P. (1999). The systematic influence of gain- and loss-framed messages on interest in and

use of different types of health behavior. *Personality and Social Psychology Bulletin*, *25*(11), 1355-1369.

Rouiller, J. Z., & Goldstein, I. L. (1993). The relationship between organizational transfer climate and positive transfer of training. *Human Resource Development Quarterly, 4*(4), 377-390.

Rowold, J. (2007). Individual influences on knowledge acquisition in a call center training context in Germany. *International Journal of Training and Development, 11*(1) 21-34.

Rusting, C. L. (1998). Personality, mood and cognitive processing of emotional information: three conceptual frameworks. *Psychological Bulletin, 124(2),* 165-196.

Schneider, T. R., Salovey, P., Apanovitch, A. M., Pizarro, J., McCarthy, D., Zullo, J., et al. (2001). The effects of message framing and ethnic targeting on mammography use among low-income women. *Health Psychology, 20,* 256-266.

Schneider, T. R., Salovey, P., Pallonen, U., Mundorf, N., Smith, & Stewart, W. (2001). Visual and auditory message framing effects on tobacco smoking. *Journal of Applied of Social Psychology, 31*(4). 667-682.

Schunk, D. H. (1989). Self-regulation and self-efficacy during self-regulated learning. *Educational Psychologist, 25*(1), 71-86.

Schwarz, N. (2002) Feelings as information: Moods influence judgments and processing strategies. In T. Gilovich, D. Griffin & D. Kahneman (Eds.). *Heuristics and biases: The psychology of intuitive judgment* (pp. 534-547). New York: Cambridge University Press.

Shiomura, K., & Atsumi, A. (2001). Induced mood states and the framing effect: A comparison of systematic and heuristic processing. *Perceptual and Motor Skills, 93,* 609 610.

Singh, J. V. (1986). Performance, slack, and risk taking in organizational decision making. *Academy of Management Journal*, 29, 562–585.

Stajkovic, A.D., Luthans, F. (1998). Self-efficacy and work-related performance: a meta-analysis. *Psychological Bulletin*, *24*, 240-61.

Tangney, J. P., Niedenthal, P. M., Covert, M. V., & Barlow, D. H. (1998). Are shame and guilt related to distinct self-discrepancies? A test of Higgins's (1987) hypotheses. *Journal of Personality and Social Psychology, 75*, 256 - 268.

Tannenbaum, S. I. (1997). Enhancing continuous learning: Diagnostic findings from multiple companies. *Human Resource Management, 36*, 437-452.

Tannenbaum, S. I., Mathieu, J. E., & Cannon, J. A. (1991). Meeting trainees' expectations: The influence of training fulfillment on the development of commitment, self-efficacy, and motivation. *Journal of Applied Psychology, 76*(6), 759-769.

Thaler, R. H. (1985). Mental accounting and consumer choice. *Marketing Science,* 4, 199–214.

Thaler, R. H. & Johnson, E. (1990). Gambling with the house money and trying to break even: The effects of outcomes on risky choice. *Management Science*, 36(6), 643-660.

Thorndike, E. L. and Woodworth, R. S. (1901) The influence of improvement in one mental function upon the efficacy of other functions. *Psychological Review* 8 , 247-261.

Toll, B., O'Malley, S., Katulak, N., Wu, R., Dubin, J. A., et al, (2007) Comparing gain-and loss-framed messages for smoking cessation with sustained release bupropriion: A randomized control trail. *Psychology of Addictive Behaviors, 21*(4), 534-544.

Tracey, J. B., Hinkin, T. R., Tannenbaum, S., & Mathieu, J. E. (2001). The influence of individual characteristics and the work environment on varying levels of training outcomes. *Human Resource Development Quarterly, 12*, 5-23.

Tracey, J. B., Tannenbaum, S. I., & Kavanagh, M. J. (1995). Applying trained skills on the job: The importance of the work environment. *Journal of Applied Psychology, 80*, 239-252.

Treiber, F. A. (1986). A comparison of the positive and negative consequences approaches upon car restraint usage. *Journal of Pediatric Psychology, 11*, 15–24.

Triesman, A. M. (1964). Verbal cues, language, and meaning in selective attention. *American Volume of Psychology, 77*, 206-219.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science, 211*(4481), 453-458.

Tykocinski, O., Higgins, E. T., & Chaiken, S. (1994). Message framing, self-discrepancies, and yielding to persuasive messages: The motivational significance of psychological situations. *Personality and Social Psychology Bulletin, 20,* 107–115.

Underwood, B. J. (1951). Associative transfer in verbal learning as a function of response similarity and degree of first-line learning. *Journal of Experimental Psychology, 42,* 44-53.

Wang, J., & Lee, A. (2006). The Role of Regulatory Focus in Preference Construction. *Journal of Marketing Research, 43.* 28-38.

Webster, J. & Martocchio, J. J. (1993). Turning work into play: Implications for microcomputer software training, *Journal of Management, 19*(1), 127-146.

Webster, J. & Martocchio, J. J. (1995). The differential effects of software training previews on training outcomes, *Journal of Management, 21*(4) 757-787.

Weiss, H. M. (1990). Learning theory and industrial psychology. In I.L. Goldstein & J. K. Ford (2002). *Training in Organizations* (4th ed.). Belmont: Wadsorth.

Williams, S., & Voon, Y. W. W. (1999). The effects of mood on managerial risk perceptions: Exploring affect and the dimensions of risk. *Journal of Social Psychology, 139,* 268-287.

Wilson, D. K., Purdon, S. E. and Wallston, K. A. (1988) Compliance to health recommendations: A theoretical overview of message framing. *Health Education Research: Theory and Practice, 3*,161-171.

Wilson, D. K., Wallston, K. A., & King, J. E. (2006). Effects of contract framing, motivation to quit, and self-efficacy on smoking reduction. *Journal of Applied Social Psychology, 20*(7), 531-547.