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Factors Affecting Motivation to Use Computer-Based Training.

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FACTORS AFFECTING MOTIVATION TO USE
COMPUTER-BASED TRAINING

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
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in partial fulfillment of the
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in
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by

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ABSTRACT

Billions of dollars are spent each year on training in an effort to increase productivity so businesses can stay competitive. However, little is known about factors that impact the trainee's decisions to use what they learned in these training programs, back on the job. Guided by a conceptual model of training evaluation and research, this research examined the influence of five sets of variables on training participant's motivation to use what they learned during a computer-based training (CBT) program in a large petro-chemical plant in Southern Louisiana.

The variables included in this study were: individual and general attitudes (love of learning, organizational commitment, and internal work motivation); situation specific attitudes (training attitudes and computer confidence); reaction (perceptions of the physical environment of the CBT program and content validity of the training materials); learning; and environmental factors (peer support, supervisor support, supervisor sanctions, and opportunity to use). Hierarchical regression was used to explore the relationships of the variable in the conceptual model and determine the amount of variance in motivation to transfer explained by each successive group of variables that entered the regression analysis.

The hierarchical regression analysis produced a $R^2$ of .605. The first model, which contained only the individual and general attitudes, was significant and had an $R^2$ of .198. The next three successive models did not added significantly to the explained variance. However, a significant portion of
additional variance (26.4%) was explained with the addition of the environmental variables in the last step of the hierarchical regression.

These data suggest a holistic approach should be taken to improve motivation to transfer. Motivation to transfer appeared to be largely a function of individual and general attitudes, and environmental attitudes, both of which are outside the design of the training program. Several of the "earlier" entering variables were significant predictors but later became non-significant after the entry of additional variables, which suggested several mediated relationships and lends a measure of support to the conceptual model. In the final model the significant predictor variables were: opportunity to use; computer confidence; peer support; and supervisor sanctions.
CHAPTER 1: INTRODUCTION

Training has been defined as a planned learning experience designed to bring about permanent changes in an individual's knowledge, attitudes, or skills (Campbell, Dunnette, Lawler, & Weick, 1970). Goldstein and Gilliam (1990) wrote that when learning events are planned in a systematic way and are focused on the work environment, they are called training programs. From their point of view, the training process is defined as "the systematic acquisition of skills, rules, concepts, or attitudes that result in improved performance in the work environment" (p. 134).

Although "training program" implies the teaching of skills and knowledge, a breakdown in the process often comes when those skills and knowledge are translated to performance on the job. Brinkerhoff (1989), in reporting on interviews conducted two months after a training program in a leading Fortune 500 company, found that 100 percent of the trainees learned the content to criterion skill and knowledge levels. However, in a 3-month follow up, less than nine percent indicated that they had made use of any of the training. In an investigation of a non-residential course offered by the Department of Management Studies at Glasgow University four times a year, Huczynski and Lewis (1980) reported a similar low rate of attempted use of training based on ad hoc interviews with trainees over a nine year period. This breakdown in the training-to-performance process is very costly for businesses today. The 1995 training budget for American organizations, with 100 or more employees, was
52.2 billion dollars for formal training (Sadowski, 1995). When indirect costs and informal on-the-job training are added into the formal training budget, total expenditure estimates range from $200 - 400 billion annually (Broad & Newstrom, 1992). When as little as 10 percent of training is paying off in the form of improved performance, huge amounts of money, time and effort are being wasted.

The emphasis on training resulting in improved performance has become increasingly important as managers face a rapidly changing business environment. Fierce global competition, rapid technological change, market expectations of new products and services, and higher quality demanded by customers in products and services are among the reasons listed by Rummler and Brache (1995) for the focus on performance improvement in business today. In order for businesses to survive in today's environment of fierce competition, they must improve productivity. Training employees to work effectively and efficiently is one of the components of increasing productivity (Campbell, 1988). Therefore, training has become an increasingly vital function of business. As a business function, training must also become more efficient and effective.

Training Magazine's 1995 Industry Report (Sadowski, 1995) of organizations with 100 or more employees, reported that although formal training budgets only increased by 3.2 percent in 1995. However, the number of individuals trained reached 49.6, which is an increase of 4.9 percent from 1994. In addition, 1995 figures for total hours of training (calculated as one
person receiving training for one hour) rose sharply by 10.2 percent, to 1.59 billion. Training needs are increasing at a faster rate than training budgets. The indication from these figures is that training programs are expected to do more training with less money (Hequet, 1995). This need for more effective and efficient training has spawned a greater emphasis on training evaluation.

Holton (1996) stated that evaluation of interventions has become one of the most critical issues faced by the field of human resource development (HRD) and, therefore, intense pressure has been placed on HRD to demonstrate that training programs are effective and contribute directly to the "bottom line." However, in order for evaluations to be the most useful HRD must go beyond simply quantifying results. Evaluations must also be diagnostic and provide information that can guide improvements that allow organizations to receive greater benefits from training. Facteau, Dobbins, Russell, Ladd, and Kudisch (1995) wrote "...it is imperative that organizations design and implement training programs in the most effective manner, and that they understand the factors that contribute to training effectiveness" (p.2).

Traditionally, training has been evaluated by looking at four components or levels of training effectiveness: trainees' reactions (did they like the training), learning (could they pass a test on the material covered), behavior (did their behavior change as a result of the training) and results (was there a benefit to the company resulting from the trainee's behavior change) (Kirkpatrick, 1994). Although this method of evaluation is designed to determine quantifiable training outcomes, it fails to take into consideration individual characteristics, attitudes,
and values. It also fails to take into account the trainee's motivations to learn the material presented or to use what was learned on the job.

Noe (1986) concluded that although the main interest in training programs has been their effectiveness, little research has been devoted to why training programs are effective for some individuals and ineffective for others. Noe proposed that "attitudes, interests, values, and expectations of trainees may attenuate or enhance the effectiveness of training" (p.737). It was reasoned that trainees' attitudes, interests, values, and expectations, along with environmental favorability, can effect trainees' motivation to learn, and to apply newly acquired skills in the work setting.

Brinkerhoff (1987) proposed a six stage evaluation model that began with evaluating needs and goals (is training the best answer to a problem) and progressed through evaluation of the HRD design, evaluation of the design operation (how well the design is working), evaluation of the learning, evaluation of the usage and endurance of learning (on-the-job behaviors), and finally evaluation payoff (results). Although Brinkerhoff added a needs assessment component to his evaluation model, little consideration was given to factors that influence or motivate the individual trainee and thus provide insight into the likelihood that he/she will react well to the training, learn the skills and information, incorporate those skills and the knowledge into their behavior, and therefore increase the productivity of the organization.

Holton (1996) proposed a HRD Evaluation Research and Measurement Model. His model has as outcomes: learning→individual performance→
organizational results. The model also specifies four classes of variables that influence these three outcomes. These classes were: secondary influences; motivational elements; environmental elements; and ability/enabling elements. The class of variables proposed to have a direct effect are ability/enabling elements and environmental elements. Motivational elements can also have a direct impact on the outcomes but they can also moderate the influence of environmental elements such as trainee reaction and transfer climate, as well as the learning that took place. Secondary influences are personality characteristics, intervention readiness, job attitudes, and intervention fulfillment and are proposed to affect the motivational elements (motivation to learn, motivation to transfer).

Holton's (1996) model goes beyond Kirkpatrick's (1994) 4-level model and attempts to specify antecedents to outcome variables. The model includes not only individual characteristics and attitudes, but also gives importance to motivational elements and specifies factors that influence motivation to learn and motivation to transfer.

Trainee motivation, which has been largely neglected in previous evaluation models, plays a vital role in training effectiveness. Whether or not the trainee uses the skills and knowledge learned in training is largely dependent on motivation (Kanfer & Ackerman, 1989). In his recent book on motivation in work organizations, Lawler (1994, see p.3) chose to use M. R. Jones' (1955) definition of motivation. Jones stated that motivation is concerned with "how behavior gets started, is energized, is sustained, is directed, is
stopped, and what kind of subjective reaction is present in the organism while all this is going on" (p. vii). A better understanding of what influences trainee motivation to use training is necessary for training to become more effective and efficient.

While the preceding discussion is relevant to all methods of training, different methods of training can add unique components to training motivation and effectiveness which must also be addressed in training evaluation. One such method is computer-based training (CBT).

In order to meet the training needs and to do so economically, new methods of training and instructional systems are likely to be utilized in the future. Warr and Bunce (1995) predict that "open" forms of learning will become substantially more important. Open learning settings are those in which individuals work on their own to learn material that is presented either in written form, through a computer, in audio or videotapes, or by an interactive video system (Warr & Bunce, 1995). A key feature of open learning is that trainees have more autonomy to decide what is studied, as well as, how, when, where, and at what pace they will progress through the information (Steward & Winter, 1992). CBT, in which learning modules are placed in work area to be used during slow work periods, is one form of open learning.

Hequet (1995) reported that CBT is being used more and more because it can be less expensive and more flexible than classroom trainers. The 1995 Industry Report (Sadowski, 1995) showed that 48 percent of companies in their survey were using CBT as an instructional method. Companies such as Union
Carbide are moving toward the use of CBT, especially for safety training, because CBT lends itself to safety refresher courses required by the federal Occupational Safety and Health Administration (OSHA) (Hequet, 1995).

Much of the research on CBT has been conducted with college age students or younger (Bates, Holton, & Seyler, 1996a). Kulik, Kulik, and Shwalb (1986) conducted a meta-analysis on effectiveness of computer-based adult education. The analysis was a comparison of computer based adult education and traditional adult education. Although it was found that computer-based education usually had a positive effect on adult learners' examination scores, as well as substantially reducing the time needed for instruction, they offered little insight into issues that might effect motivation of the trainee to learn and/or use information in the training program. Ability level of learners was the only variable included that could give any explanation of why some individuals responded better to training than other individuals.

CBT fits well with principles of adult education (Reynolds, 1990), as put forth by Knowles (1984) and others. However, little research has been done to explore the issue of how trainees' level of computer confidence affects their motivation to learn materials outside training in which the subject of training was how to use computers or specific computer software. This gap in the literature is especially true of studies in a field setting.

Ryman and Biersner's (1975) study indicated that specific attitudes toward training (namely, confidence, expectations, and motivation) can be used to predict who will succeed and who will fail in a training program. How people
judge their capabilities affects their motivation and behavior (Bandura, 1982). Trainees' confidence concerning their acquisition of the knowledge and skills provided by training can affect their motivation to use the training. As CBT is expected to become even more widely used, there is a need for research that determines if trainees' confidence in using computers has an effect on their motivation to learn and their motivation to use what they learned on the job.

In summary, CBT has been recognized as an effective alternative to classroom instruction. It is being more widely used by organizations today because of its flexibility and its cost effectiveness. However, evaluation research has failed to include the unique influence that trainees' computer confidence may have on trainees' motivation to learn training materials and subsequently their motivation to use materials learned on the job. Therefore, there is a pressing need for training evaluation that not only answers the question of "was the training effective?" but that also gives answers to "why" some trainees are more motivated to use their training than other trainees, particularly when CBT is used.

Holton's (1996) model profiles a framework for a more comprehensive and diagnostic approach to evaluation. It holds promise of helping to explain why some individuals are more motivated and, therefore, transfer their learning to the job context and ultimately contribute to the organization's goals. However, the model has not been tested in a field setting. Testing components of this model would add to the literature on determinants of motivation to
transfer and give direction for theory testing, as well, as give valuable guidance to practitioners in the field of HRD.

Statement of the Problem

Billions of dollars are spent each year on training in an effort to increase productivity so businesses can stay competitive in the face of fierce global competition and a rapidly changing environment. Training is focused on trying to change or teach new behaviors to individual trainees. However, little is known about factors that impact the trainee’s decision to use the training. From a cognitive perspective of motivation, individuals make choices about which actions they will take based on a combination of factors (Vroom, 1964). Therefore, understanding the factors that influence an individual’s choices, in particular their choice to use or not use training, would be valuable in determining how to motivate them to make the choice that would benefit the organization.

This type of research has both theoretical and practical implications. From a theoretical standpoint, a test of key components, mainly outside the training design, in a more comprehensive conceptual framework of training effectiveness can add to the literature and give guidance to future research and theory testing efforts in the field of training and development.

From a practical standpoint, a better understanding of why training is effective for some individuals and less effective for others can help focus and improve interventions. A better understanding of the factors that influence the
trainees' motivation to transfer training would be useful in guiding needs assessments, designing as well as improving existing training programs, and designing more thorough evaluations. More effective interventions should lead to greater learning and transfer behavior which in turn should lead to improved performance and increased profits.

**Purpose of the Study**

The primary purpose of this study is to empirically and systematically examine a computer-based training program in a field setting to determine if there are factors that affect the trainees' motivation to transfer training to the job situation. The study will test the effect of the following variables and groups of variables on the trainees motivation to transfer the training they received in the training program:

1. Individual and general attitudes (love of learning, internal work motivation and organizational commitment);
2. Situation specific attitudes (training attitudes and computer confidence);
3. Reaction (perceptions of the physical environment of the CBT program and content validity of the training materials);
4. Learning; and
5. Environmental factors (peer support, supervisor support, supervisor sanctions, and opportunity to use).

The sample will also be described in terms of its mean and standard deviation on the following variables: love of learning, internal work,
organizational commitment, computer confidence, training attitudes, perceptions of physical learning environment and content validity, learning achieved, supervisor support, supervisor sanctions, and opportunity to use the training.

Research Hypotheses

The following hypotheses were developed to guide the research in conducting this study.

\( \text{H}_1 \) Individual and general attitudes (love of learning, internal work motivation, and organizational commitment) will be positively correlated with motivation to transfer training to the job situation.

\( \text{H}_2 \) Situation specific attitudes (training attitudes and computer confidence) will be positively correlated with motivation to transfer training to the job situation.

\( \text{H}_3 \) Reaction to training (perceptions of the physical learning environment and content validity of the training materials) will be positively correlated with motivation to transfer training to the job situation.

\( \text{H}_4 \) Learning will be positively correlated with motivation to transfer training to the job situation.

\( \text{H}_5 \) Environmental factors (supervisor support, peer support, and opportunity to use) will be positively correlated with motivation to transfer training to the job situation.

\( \text{H}_6 \) Environmental factor - supervisor sanction will be negatively correlated with motivation to transfer training to the job situation.
Individual/general attitudes (love of learning, organizational commitment, and internal work motivation) will explain a significant proportion of the variance in motivation to transfer training to the job situation.

Situation specific attitudes/motivation to learn (training attitudes and computer confidence) will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by individual/general attitude variables.

Reaction to training (learning environment and content validity) will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by individual/general attitudes variables and situational specific variables.

Learning measures will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by individual/general attitude variables, situational specific variables, and reaction variables.

Environmental factors (peer support, supervisor support, supervisor sanctions, and opportunity to use) will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by individual/general attitude variables, situational specific variables, reaction variables, and learning.

Assumptions
1. Because participants in this study are current employees and not newly hired recruits and because much of the training is refresher training, it is
reasonable to assume that all of the information to be learned in this
program was within the ability level of trainees.

Limitations

1. The data for this study was collected from a purposive sample of two
work units at one plant site; therefore, the findings should be generalized
with caution.

2. Tests to determine learning scores were created by the design team at
the plant site and were not available a priori for content validation,
therefore, content validity of test cannot be assured.

3. Respondents were assured of confidentiality, however, they were
required to put their name on each of the survey instruments in order for
the researcher to link data from each of the instruments and learning
scores together for data analysis. Fear of having their responses seen
by their employer/supervisor may have caused some respondents to
answer in a manner that would be more acceptable to their
employer/supervisor.

4. Due to logistic considerations of conducting research in a field setting,
pre-tests were not performed, therefore, learning cannot be directly
attributed to the training.

5. Due to the nature of the field study, access to a control group was not
possible, therefore; no comparisons can be made regarding computer
based training and traditional training programs.
CHAPTER 2: LITERATURE REVIEW

The following review of related literature is organized by the variables to be included in the testing of the hypotheses. First, a conceptual framework and the model that is to guide the research will be discussed. Second, literature related to the outcome variable, motivation to transfer, will be examined. Literature supporting the possible influence of each of the independent variables on the dependent variable will then be discussed. Finally, a section on theory will be presented to give further support for the rationale of including the different variables.

Conceptual Framework

Motivation plays an important role in both trainability and performance. Trainability has been defined by Noe and Schmitt (1986) as "the degree to which training participants are able to learn and apply the material emphasized in the training program" (p.498). Wexley and Latham (1981) portrayed trainability as a function of the trainee's ability and motivation, thus \( \text{Trainability} = f(\text{Ability} \times \text{Motivation}) \). Many theorists (Lawler, 1994) expressed the relationship of motivation to performance as: \( \text{Performance} = f(\text{Ability} \times \text{Motivation}) \). Performance is seen as the result of ability times motivation. Thus, how much a person gains from training and how well a person performs an activity is largely a function of their ability and their motivation.

Noe and Schmitt (1986) expanded the Wexley and Latham (1981) trainability equation to also include an environmental component [Trainability =
[(Ability, Motivation, Environmental Favorability)]. Environmental favorability refers to both trainees' perceptions of social support for the use of new skills and possible task constraints. This formula (Noe & Schmitt, 1986) suggests that for training to be the most effective, a trainee should have the ability and motivation to master the training materials and that the environment to which they return must be supportive of the use of the training.

While Noe and Schmitt's (1986) formula seems logical, in a dynamic model a feedback loop would enter into the equation. Trainees who have previous experience with training programs within the organization may develop perceptions of the environmental influences before new training programs are instituted. These perceptions of environmental factors can influence motivation to learn and motivation to transfer (Baldwin & Ford, 1988; Cohan, 1990; Noe, 1986). In other words, for trainees who have prior experience with training in a particular organization, expectations can develop about how supportive the work environment will be towards future training and what rewards or punishments will result from using or not using the training on the job. These expectations can influence trainees' level of motivation regarding learning and using training prior to entering the training program. Therefore, for experienced workers perceived environments become a moderating variable between learning and motivation to transfer (Noe, 1986) rather than a moderating variable between motivation to transfer and performance, as is more typical with new hires who have not been exposed to the organizational environment prior to training.
Moving from this general formula to a more specific conceptual framework, Holton's (1996) HRD Evaluation Research and Measurement Model hypothesizes the order of influence of variables and groups of variables on motivation to transfer. Holton's complete model is depicted in Figure 1. His model is a research model intended to guide future research. It takes into account secondary influences, motivational elements, and environmental elements and shows how these interact and influence training outcomes. In this study, the complete model will not be tested. Only the portions of the model related to motivation to transfer will be used as a guide. This model shows motivation to transfer as having a direct influence on individual performance. Job attitudes, learning, intervention fulfillment, transfer climate, and expected utility/ROI have direct influences on motivation to transfer. Personality characteristics, motivation to learn, and reaction have indirect influences on motivation to transfer through learning.

Figure 2 shows the components of the Holton's (1996) model to be tested in this study. Personality/individual characteristic (love of learning) and job attitudes (organizational commitment and internal work motivation) influence motivation to learn. Components of motivation to learn (computer confidence and training attitudes) then influence learning and reaction (perceived content validity of training and reaction to the learning environment). Reaction also has a direct influence on learning. Learning, job attitudes, and environmental
influences (peer support, supervisor support, supervisor sanctions and opportunity to use) directly influence motivation to transfer.
Motivation to Transfer

Definition

Skill acquisition and performance fundamentally hinge upon motivation (Kanfer & Ackerman, 1989). Jones' (1955) definition of motivation was presented earlier, however, Kanfer and Ackerman's later definition categorized motivation in terms of intensity and persistence. They defined motivation as "the direction of attentional effort, the proportion of total attentional effort directed to the task (intensity), and the extent to which attentional effort toward the task is maintained over time (persistence)" (p.661). Positive transfer of training is the application of the knowledge, skills, and attitudes gained in a training context to the trainee's job (Wexley & Latham, 1981). For transfer to have occurred the behaviors learned in training must be generalized to the job context and maintained over a period of time (Baldwin & Ford, 1988). Therefore, motivation to transfer (as defined in this study) is the directional, intensity and persistency of effort toward utilizing the skills and knowledge learned in a training atmosphere to the real world work situation. When motivation to transfer is low, trainees are less likely to use the skills and knowledge learned in training in their work setting.

Studies Related to Motivation to Transfer

Although many studies have been conducted related to transfer of training (see Baldwin & Ford, 1988 for a review), few have tried to explain what factors influence motivation to transfer or how motivation to transfer affects performance. Individual differences in trainees' attitudes and expectations may
be important determinants of training effectiveness, however few researchers have examined these constructs empirically (Tannenbaum & Yukl, 1992) or their influence on motivation to transfer.

Tannenbaum, Mathieu, Salas, and Cannon-Bowers (1991) investigated how trainees' expectations and desires before training, and their subsequent perceptions of what occurred during training, influenced the development of post-training motivation. Participants were 1,037 trainees attending Naval recruit training. Training motivation was assessed by a Likert-type scale based on expectancy theory. The example given was "If I am successful in recruit training it will better enable me to perform my job in the Navy" (p. 763). The hypotheses that training fulfillment and trainee reactions each individually would be positively related to the development of posttraining motivation, while controlling for individual variables (i.e., age, gender, family history, cognitive ability, and pretraining attitudes), were tested using regression analysis. Both of these hypotheses were supported in their study. It was also found that test performance was positively related to training motivation.

This study (Tannenbaum et al., 1991) suggests that when training meets or fulfills trainee's expectations and desires, posttraining motivation will be higher. In addition when trainees' have more positive reactions to training and learn more, as indicated from test performance measures, they will have higher posttraining motivation. Trainees with higher posttraining motivation should be more motivated to use their training and make a better contribution to the organization (Tannenbaum et al., 1991).
Huczynski and Lewis (1980) examined trainees' intent to use training. They administered pre- and post-course questionnaires to training participants to determine whether they intended to transfer their training to their work and whether they had in fact done so. Levels of motivation to transfer learning were gauged by questions designed to determine the individual participants perceived usefulness of the course.

Four months after the end of the course, a questionnaire was sent to participants which assessed organizational factors inhibiting or encouraging transfer of course learning. Results showed that of the 48 respondents studied, 17 attempted to transfer what they had learned in their work (Huczynski & Lewis, 1980). A comparison of those who had attempted to transfer and those who had not attempted to transfer revealed that those who attempted to transfer were more likely to have had the following characteristics:

1. More participants had attended the course on their own initiative.
2. They believed before the course that it would help them in their jobs.
3. More of them had discussed the content before the course (in 69 percent of the cases, the discussion was with the immediate superior) (p. 232).

Huczynski and Lewis' (1980) believed their findings raised the issue of the relevance of training to the job and the importance of providing the correct motivational climate in organizations to enhance the learning and its subsequent application. Comments from those participants who did not attempt to transfer
their learning indicated that they had no clear idea of why they were being trained, what they were expected to learn either by supervisors or the organization, or how the learning was to be used within the organization. Huczynski and Lewis concluded that it was clear for the participants who did not attempt to transfer there was a lack of interest and commitment from the start of the training.

In sum, this study (Huczynski & Lewis, 1980) supports the importance of trainees' perceptions of the usefulness of training content and the importance of organizational transfer climate. Seventy-one percent of the beneficial results occurred when the transfer was supported. The largest percent (70 percent) of these benefits were supported by superiors. The data indicated that a trainee can learn the technique and wish to apply it, but fail because he/she either lacks the skill in knowing how and where it can be applied, and/or because he/she does not perceive the organization as valuing and encouraging the application. These findings pointed to the fact that organizational influences act on the trainee both before the course begins, as well as, after it.

Baumgartel and Jeanpierre (1972) also found that in management training, those managers who perceived the training as helpful in learning skills and techniques directly related to their job situation were more likely to attempt to use their training when they returned to work. However, organizational climate was the single most important factor affecting efforts to apply new knowledge in the back-home setting.
Attempts have been made to find ways to increase transfer of training and to maintain the effect of the training over a period of time. The main focus of a study by Tziner, Haccoun, and Kadish (1991) was to test the effectiveness of adding a relapse prevention module to a two-week training program. The findings gave evidence that trainees who perceived a more supportive environment and who received the relapse prevention module, were perceived by their supervisors as displaying greater levels of transfer strategies. No support was found for the use of relapse prevention training having an effect on motivation to transfer (Tziner et al., 1991). However, since supervisors reported that transfer behavior had occurred, thought should be given to the reasons for lack of support for motivation to transfer. The instrument used to measure motivation to transfer was the same instrument used by Noe (1986) who also failed to find significant results (Noe & Schmitt, 1986) regarding the motivation to transfer variable. It could be possible that a more sensitive measure of motivation to transfer was needed. Additionally the sample size for this research was relatively small.

Baldwin and Ford (1988) presented a conceptual model of the transfer process (see Figure 3). Transfer of training was shown as the generalization and maintenance of learning to the work situation in their model. Generalization and maintenance was directly influenced by trainee characteristics, learning and retention, and work environment. Motivation was shown as a trainee characteristic, which impacts learning and retention, as well as generalization and maintenance. Work environment was shown to have a direct influence on
learning and generalization and maintenance but is not shown to affect motivation. This model is useful in categorizing components of the transfer literature and it shows the importance of motivation to both learning and transfer of training; however, it fails to acknowledge that motivation can be influenced by trainee characteristics and attitudes, training design, and perceived work environment.

In Noe's (1986) model, motivation to transfer was hypothesized to moderate the relationship between learning and behavior change. He hypothesized that trainees' perceptions of work group support and task constraints influence motivation to transfer. Noe concluded that "maximum behavior change is likely to result when trainees have mastered the program content and are highly motivated to use newly acquired skills on the job" (p. 739).

Noe and Schmitt (1986) later tested Noe's (1986) model using path analysis. Questionnaires were used to assess trainee attitudes. An example of the motivation to transfer questions was "The skills I learned in Springfield will be helpful in solving work-related problems" (p. 509). Performance measures were taken from each participant's immediate supervisor and two teachers and two support staff members who interacted with the educator on a daily basis using an anchored rating scale. The initial path model did not fit the data well. The hypothesized moderating effect of posttraining motivation on the learning—behavior-change relationship was not supported. A revised model was tested...
and indicated that job involvement and career planning were antecedents of learning and behavior change.

Noe's (1986) justification for the model has many logical and theoretical strong points to support his conceptual model of motivational influences on training effectiveness; therefore, results from the Noe and Schmitt (1986) study, in which the model was tested, were disappointing. The lack of support found for his initial model may be due to the design of the study. Participants in their study were 60 educators, however, due to missing data the sample size was reduced to 44. This is a relatively small sample and may have impacted the power of the statistics to find significant results. Also, the study was done with educators rather than a for-profit organization, where pressures to perform and competition can be somewhat different. Although the study found few positive
results, the study and justification of the model does point to the need for further research focused on attitudes and values of trainees.

**Studies That Examined Training Motivation**

There are research studies that examined training motivation or pretraining motivation. In these cases training motivation is more focused on the learning or training process rather than the transfer process. However, pretraining motivation may influence motivation to transfer, therefore two studies that examine pretraining motivation are included in this review.

Facteau et al. (1995) developed a training model that incorporated the effects of employees' attitudes and beliefs about training in general on pretraining motivation and perceived training transfer. Subjects were 967 managers and supervisors employed in state government. Data was collected using self-report questionnaires containing agree-disagree scale items. Their revised model indicated that, for training attitudes, both training reputation and intrinsic incentives were positively related to pretraining motivation. A negative predicted relationship between compliance and pretraining motivation was supported. The organizational commitment, classified as an individual attitude, was positively related to pretraining motivation. Of the social support variables, only supervisor support was positively related to pretraining motivation. Subordinate and top management support were negatively related to pretraining motivation. Pretraining motivation along with subordinate and peer support were positively related to perceived training transfer.
Because pretraining motivation was positively related to perceived training transfer, it can be speculated that pretraining motivation was also related to motivation to transfer. Therefore, variables, such as organizational commitment and training attitudes, that affected pretraining motivation, could also have an indirect influence on motivation to transfer.

An exploratory field study of training motivation was conducted by Clark, Dobbins, and Ladd (1993). Their model was built upon expectancy theory. They proposed pretraining motivation to be a direct function of the extent to which the trainee believes that training will result in either job utility or career utility. The model also recognized that several social processes affect training motivation indirectly through perceived job and career utility. These indirect influences of training motivation included trainees' involvement in training decision, credibility of the individual that recommends training, and supervisor's and group's support for training. Participants (N=245) in the study were from 12 organizational training groups. Training motivation was shown to be affected by perceived job and career utility. Perceived job utility was affected by decision involvement and credibility of the decision maker. Anticipated supervisor training transfer climate was a marginally significant predictor of job utility, which in turn, affected training motivation.

The importance of Clark et al.'s (1995) study in relation to the present study is that motivation is seen as a function of job utility or usefulness. Motivation was low when trainees did not believe that training would help them with their job performance or career opportunities. Additionally, when trainees
did not believe that their supervisors would be supportive of transfer of training then their perception of the usefulness of the training was lowered. Although the measure of motivation, in this study, was pretraining motivation, it can be reasoned that a person may enter training assuming training content will be useful, but after attending the training, judge training content to have little utility. In such a case, perceived job utility and career utility would influence motivation to use/transfer.

Studies Examining the Influence of Transfer Climate

Several studies have shown the importance of the organizational environment or transfer climate on transfer of training from the learning situation to the work setting (Baumgartel & Jeanpierre, 1972; Baumgartel, Sullivan, & Dunn, 1978; Baumgartel, Reynolds, & Pathan, 1984; Brinkerhoff & Montesino, 1995; Rouiller & Goldstein, 1993; and Tracey, Tannenbaum & Kavanagh, 1995). Motivation to transfer was not included as a primary variable of study in any of these studies. However, in the stream of research headed by Baumgartel, motivation was explored somewhat. Baumgartel et al. (1984), found trainees' need for achievement to be a significant motivator in transfer of learning. Baumgartel and Jeanpierre concluded that it was apparent from their research that personal value orientations and motivations play a significant role in the transfer of innovations learned in training back to the job. However, they did acknowledge that their study only provided sketch evidence of that fact. The most important finding related to the present research was a double interaction between climate and personality (Baumgartel et al., 1978). Not only
did a favorable climate enhance the transfer (adoptive) efforts of innovators (trainees with personalities that were more favorable to transfer), but a favorable climate also was shown to produce a relatively larger proportion of persons high in adoptive dispositions. Thus, the dilemma is that persons from a supportive environment benefit most, and conversely, persons from the least supportive environments (often those with the greatest "need") benefit least from training activities (Baumgartel et al., 1978). This finding lends support to the idea that trainees from environments that are perceived to be supportive are more motivated to transfer training back to the work setting than trainees from those environments perceived to be less supportive.

Summary

Motivation has been conceptualized as influencing learning and transfer of learning. Motivation to transfer can be conceptualized as moderating the relationship between training and behavior change (Noe, 1986). Motivation to transfer has been shown to be influenced by: fulfilling training expectations and desires, training reactions, learning (Tannanbaum et al., 1991), perceived usefulness, and perceived supervisory support (Huczynski & Lewis, 1980). Pretraining motivation has been found to be influenced by: training attitudes, individual attitudes, intrinsic rewards (Facteau et al., 1995), and perceived job and career utility (Clark et al., 1993).

Two research models that included motivation to transfer were found. These were Holton's (1996) Evaluation Research and Measurement Model and Noe's Motivational Influences on Training Effectiveness Model. Holton's model
has not been tested and Noe's original model was not supported by the data in a study conducted by Noe and Schmitt (1986). Noe and Schmitt's study may have been hampered by their small sample size.

Although transfer of training has been receiving more attention in the research literature (Brinkerhoff & Montesino, 1995; Rouiller & Goldstein, 1993; Tracey et al., 1995), the component of motivation to transfer has been largely ignored or assumed. However, a stream of research headed by Baumgartel (Baumgartel et al., 1972, 1978, 1984) did lend some support to the proposition that personality characteristics and organizational climate affect motivation to transfer.

Clearly there is a gap in the literature of empirical research that provides an understanding of what influences motivation to transfer, as well as, the influence of motivation to transfer on performance. Additionally, motivation is difficult to measure. It appears to have been measured based primarily by self-report questionnaire with questions related to usefulness and value of the training to the trainee. However, both studies that used Noe and Schmitt's measure of motivation to transfer (Noe & Schmitt, 1986; Tziner et al., 1991) failed to find significant results. Therefore, there appears to be a need for a stronger measure of motivation to transfer.

**Factors Influencing Motivation to Transfer**

**General and Individual Attitudes**

General and individual attitudes, as used in this study, are attitudes that the trainee brings to the training program with him/her. They are attitudes that
are not directly related to the training program but are personality traits that can influence both motivation to learn and motivation to transfer. In this study general and individual attitudes included, the individual attitude, love of learning and, the job attitudes, internal work motivation and organizational commitment.

**Love of Learning.** The concept of love of learning, as used in this study, embodies the intrinsic reward that a person receives from the act and process of learning new things. It includes the idea that learning is fun, promotes personal growth, and continues throughout life. No research could be found that related this concept to a training situation. However from a theoretical standpoint many authors who focused on motivation (e.g., Lawler, 1994; Vroom, 1964) hypothesized that theories of motivation were greatly influenced by the principles of hedonism. Hedonism has as its basic assumption that behavior is directed toward pleasure and away from pain. Another concept explored by Lawler (1994) was achievement motivation. In reviewing the literature on achievement motivation, Lawler concluded that people with a high need for achievement are more prone to seek out situations in which they can achieve, and they tend to find successful performance attractive once they are in these situations.

Maslow's (1954) hierarchy of needs gives self-actualization as a need that people have after they have satisfied the more basic needs. Self-actualization was described as the need people have to grow and develop. Porter, Lawler, and Hackman (1975) proposed that man is proactive or that individuals seek means to satisfy their personal needs and pursue their goals.
and aspirations. Therefore, the need to grow and develop as a person is a needs motivation and learning is a means of fulfilling this need.

Bass and Vaughn (1966) stated that "A goal is intrinsically reinforcing if its achievement is naturally or inevitably reinforcing" (p. 56). Also, in discussing readiness to learn, they posted that a person must want to learn or want to satisfy an existing drive state before they are ready to learn.

Locke (1965) reported on four laboratory experiments which examined the relationship between the degree of task success and degree of liking for and satisfaction with the task. Degree of liking for the task was measured by having the subjects rate their liking for a specific task on a 9-point scale. The findings from these four experiments gave strong support to the generality of a linear relationship between degree of task success and degree of liking for and satisfaction with the task. Therefore, it can be reasoned that if people like to learn, they are probably more successful learners. More successful learners are hypothesized to be more motivated to transfer than those who are less successful at learning the materials presented in training.

Hill, Smith and Mann (1987) in discussing people's reluctance to use computers stated that cognitive laziness could adequately explain their reluctance. In other words, people who did not want to make the effort to learn how to use the computer were reluctant to use it.

Adult learning theorist have attempted to classify individuals who love learn. Knowles (1984), using Houle's categorization of learners, classified these individual as learning-oriented. Based on work by Morstain and Smart, Merriam
and Caffarella (1991) defined individuals who enjoy learning as having a cognitive interest. These learners seek knowledge for its own sake. They enjoy learning and the potential for personal growth which learning offers. This learning-oriented attitude is believed to develop in childhood (Knowles, 1984).

From the theory discussed and the studies on task liking, it can be reasoned that those individuals who enjoy learning are more likely to be motivated to learn, thus may learn more, and therefore, be more motivated to transfer what they learned.

**Internal Work Motivation.** Internal work motivation refers to feelings of satisfaction that a person gets from doing his/her job well. Hackman and Oldham (1976) characterized people who are internally work motivated as experiencing positive internal feelings when they perform their jobs effectively and experiencing negative feelings when they perform poorly. Porter et al. (1975), in explaining Maslow's hierarchy of needs stated that lower level needs can be satisfied only with external outcomes (e.g., food, clothing, praise from another person), but the need for self-actualization and competency seems to be satisfied by outcomes which are internal to the person (e.g., feelings of accomplishment and growth). They further explained that certain environmental conditions are needed before the internal outcomes can be obtained, however, the outcomes themselves are not observable to others and are controlled by the recipient.

One study was found that related needs achievement to motivation to transfer learning. In a study of managerial training, Baumgartel et al. (1984)
reported on respondents' responses to a single questionnaire item which explained the meaning of the concept, and then asked the respondents the extent to which the desire to achieve was his/her dominant managerial motivation in relation to other managerial motivations to transfer learning. Results showed that 32 percent indicated that the desire to achieve was their "main managerial motivation" and 43 percent indicated it was "an important managerial motivation".

A limited amount of research has been done in the area of internal work motivation and work performance. Hackman and Lawler (1971) reported the results of a study conducted with telephone company employees (N=270). They found that internal work motivation was significantly and positively related to supervisory ratings of overall job effectiveness. Oldham (1976) also found support for a positive correlation between levels of self-reported internal work motivation and supervisory ratings of work effort, work quality, and quantity of work.

Johnson and Perlow (1992) performed a laboratory study to examine the effects of components of need for achievement on goal commitment and performance. Participants were 54 undergraduate students who were measured on need for achievement, goal commitment, perceived goal difficulty, and performance. Results showed higher need for mastery to be associated with greater goal commitment. It was also shown that need for mastery influenced goal commitment which in turn influenced performance. Goal
commitment has been considered a measure of motivation (Baldwin & Ford, 1988).

Theorists have accepted that there are people who are motivated by the desire to achieve and perform their jobs or tasks well. Although little research has focused on the need to perform a job well and its impact on training motivation, theories and research in the area of goal commitment and performance can be hypothesized to generalize to a training situation.

**Organizational Commitment.** In their study of effects of organizational commitment and job satisfaction on turnover among psychiatric technicians, Porter, Steers, Mowday and Boulian (1974) defined organizational commitment within the context of their study in terms of "the strength of an individual's identification with and involvement in a particular organization" (p. 604). They further posited that organizational commitment can be characterized by at least three factors:

1. strong belief in and acceptance of the organization's goals and values; 
2. a willingness to exert considerable effort on behalf of the organization; 
3. a definite desire to maintain organizational membership

Based on this definition and the factors characterizing organizational commitment, it would be logical to hypothesize that individuals high in organizational commitment would want to support the organization's goals, put forth more effort in the learning situation, and therefore, be more motivated to transfer what they learned.
Allen and Meyer (1990) separate organizational commitment into three different components. They characterize affective commitment as the employees' emotional attachment, identification with and involvement in the organization. This definition is similar to Porter et al.'s (1974). The second component of organizational commitment was termed continuance commitment and refers to commitment based on the costs that employees associate with leaving the organization. The final component was normative. It refers to employees' feelings of obligation to remain with the organization.

Few studies in the training literature have included organizational commitment as a variable to explain training outcomes. Facteau et al. (1995) demonstrated that organizational commitment was highly correlated to pretraining motivation. Noe and Schmitt (1986) found support for their model that employees in training that had high job involvement (a related construct) acquired more knowledge as a result of participating in the training program than did trainees who reported being less job involved.

Although few studies have examined the effect of organizational commitment on training outcomes, there have been several studies that examine the effect of organization commitment on motivation to perform and performance. If organizational commitment influences performance it would logically follow that organizational commitment could also have an effect on motivation to transfer since motivation to transfer is seen as an effort to improve performance. Therefore, studies that have examined the effect of
organizational commitment on performance have been included in this literature review.

Findings have been mixed regarding the influence of organizational commitment on performance. A correlation was found between organizational commitment and motivation to perform (DeCotiis & Summers, 1987; Mathieu & Zajac, 1990; Mowday, Steers, & Porter, 1979). In a meta-analysis Mathieu & Zajac (1990) found little support for a strong relationship between organizational commitment and performance as measured by performance ratings (primarily supervisory) and output measures as performance criteria. Steers (1977) also found inconclusive evidence that organizational commitment was related to performance. However, DeCotiis and Summers found strong support for the relationship between organizational commitment and objective measures of job performance.

Perhaps the multi-dimensionality of organizational commitment accounts for a portion of the discrepancies in findings related to organizational commitment and performance. In a study done with 123 junior-level-staff accounts and 46 senior-level accounts, the findings suggested that the nature of commitment may change over time (Ferris, 1981). Junior-level accounts were found to be influenced by a willingness to exert effort on behalf of the organization. However, in the senior-level sample, performance was found to be influenced by a desire to maintain membership.

Meyer, Paunonen, Gellathy, Goffin, and Jackson (1989) tested effects of three different dimensions of organizational commitment on performance of first-
level managers in a large food service company. The two dimensions were affective commitment and continuance commitment. They used Porter et al.'s (1975) definition of organizational commitment as "the strength of an individual's identification with and involvement in a particular organization" (p.604) as affective commitment. Continuance commitment was characterized as the perceived cost of leaving an organization such as loss of benefits and seniority and the cost of seeking a new job (Allen & Meyer, 1990).

Meyer et al. (1989) tested the hypothesis that affective commitment would be positively related to performance and continuance commitment would be negatively related to performance. The results showed that correlations between affective commitment and three performance measures were all positive and were significant for the overall performance and promotability rating. Conversely, correlations between the continuance commitment measure and the three performance measures were all significantly negative. Meyer et al. concluded that the value of commitment to the organization may depend on the nature of the commitment.

Although findings have been mixed, it can be seen that there is evidence that organizational commitment does affect employees' motivation to perform as well as their actual performance. It can be reasoned that employees who are more motivated to perform may also be more motivated to utilize training to improve their job performance. Therefore, if organizational commitment affects motivation to perform it may also affect motivation to transfer.
Situational Specific Variables

These variables are termed situational variables because their influence on motivation to learn is more specific to the situation. Computer confidence is more specific because the trainees must use the computer to access the training materials. Training attitudes are specific because they are attitudes trainees may have developed about safety and procedures training.

Computer Confidence. Computer based instruction (CBI), computer based education (CBE), computer aided instruction (CAI) and computer based training (CBT) are all methods of instruction in which the computer is used to deliver the information to be learned to the learner. In the following discussion these terms will be used interchangeably.

There are many advantages to using computers in a training situation. Some of the advantages of computers as a learning method reported by Relan (1992) were: privacy, training doesn't have to be in a classroom; no teacher expectations; attention gaining devices; more personal control; instruction can be individualized and interactive; students can work at their own pace, thus reducing anxiety resulting from time pressures for learning and test; and immediate, consistent and non-judgmental feedback.

According to Warr and Bunce (1995) CBT falls under the rubric of open learning. A key feature of open learning is that the learner has more autonomy to decide what to study, as well as how, when, and at what pace (Stewart & Winter, 1992). Warr and Bunce give an example in which they describe a situation where the learner utilizes time during the working day to undertake the
training on his/her own. They stated that during this type of training, interaction with other learners is likely to be reduced in comparison with conventional training. Additionally, learning is likely to take longer to complete because it is often interspersed among other activities. Warr and Bunce predicted that this type of training will become more common in the future, because organizations will seek to train staff members flexibly, to take advantage of technological advances, and to encourage employees to be proactive in their own development.

In situations in which computers have been used to instruct adults (Kulik et al., 1986), it has been found that more of the examination scores were higher when compared with those students who were taught conventionally. It was also found that CBE students required less than three-fourths as much instructional time as did students who were taught conventionally. Similar results were also found in a meta-analysis of 199 studies assessing the effectiveness of CBE in elementary schools, high schools, colleges, and nontraditional postsecondary institutes (Kulik & Kulik, 1987).

CBT has been found to be cost-efficient as well as an effective means of instructional delivery for learning information (Collis, Oberg, & Shera, 1988-89; Delamontagne & Mack, 1987). Collis et al. listed the initial costs in using CBT tutorials to help students learn statistics as purchasing the equipment and site licensing of the software packages. The only recurring cost was duplication of tests and handouts.
Additional savings from CBT can be found in the reduced need for instructors when the information is being delivered by CBT. Training staff salaries represented 72 percent of the total budget for formal training in 1995 (Sadowski, 1995). In addition, if CBT requires less time, substantial savings can accrue from trainees being away from their jobs for shorter periods of time.

However, CBT requires additional skills that a classroom setting does not. The trainee must use a computer. Lack of computer confidence may decrease the effectiveness of CBT.

When discussing computer technology the term computer anxiety often comes to mind. Cambre and Cook (1985) quote several sources for a definition of computer anxiety: Raub (1981) "the complex emotional reactions that are evoked in individuals who interpret computers as personally threatening" (p.9); Maurer (1983) "the fear and apprehension felt by an individual when considering the implications of utilizing computer technology, or when actually using computer technology" (p.2); Rohner and Simonson (1981) "the mixture of fear, apprehension, and hope that people feel when planning to interact or when actually interacting with a computer" (p.551). These definitions clearly indicate that if computer confidence were a continuum, computer anxiety falls at the extreme low end of computer confidence.

In this study computer confidence includes some components of computer anxiety. A justification for including computer anxiety as a component of computer confidence is found in the studies of Loyd and Gressard (1984) and Bandalos and Benson (1990). A factor analysis of a 29-item computer attitudes
survey by Loyd and Gressard resulted in computer confidence and computer anxiety representing two separate subscales. However, Bandalos and Benson using the same survey instrument found that computer confidence and computer anxiety factored into one subscale. Loyd and Gressard used as their method of factor extraction principal components with orthogonal rotation. As a result, it is not entirely clear that their factors are theoretically independent. It is not reasonable to use principal components if the goal is to seek a 'common factor structure' that underlies a set of items (Bandalos & Benson, 1990). Therefore, Bandalos and Benson used principal factors analysis with oblique rotation of the factors. LISREL VI was used to perform confirmatory factor analyses. Reliability estimated by coefficient alpha for the computer confidence subscale was .93 (Bandalos & Benson, 1990). Based on these findings and similar findings by Holton, Seyler, and Bates (1996) using the same instrument and factor analysis procedures, it can be reasoned that computer confidence and computer anxiety are a continuum reflecting how computer users assess their ability to deal with computers.

Computer anxiety has been shown to adversely affect the effectiveness of CBT (Harrington, McElroy, & Morrow, 1990; Marcoulides, 1988). In a laboratory experiment involving the learning of WordStar, a personal computer word processing software package, Harrington et al., found that high computer anxious subjects indicated that they would be more likely to avoid using WordStar than low computer anxious subjects.
In a study conducted with college students, Bracey (1988) found that students' anxiety over using computers had a negative effect on computer aptitude. He also found that the higher the students' computer aptitude, the higher their achievement.

Computer confidence can be related to the concept of self-efficacy (Ertmer, Evenbeck, Cennamo & Lehman, 1994). Oliver and Shapiro (1993) define computer self-efficacy as "an individual's beliefs of their capability for using the computer" (p. 81). Oliver and Shapiro refer to Bandura's (1986) belief that motivation is affected by both outcome and efficacy expectations. Outcome expectations are the belief that a specific behavior will lead to a specific outcome. Efficacy expectation is a person's belief that he/she will be able to accomplish the behavior needed to achieve a certain goal or outcome.

It is postulated that if a person expects to succeed in a given task (high efficacy expectations), the chances are better that he/she will be successful. For this reason, outcomes are considered to be influenced by efficacy expectations (Olivier & Shapiro, 1993). Individuals who see themselves as efficacious in using the computer will expect positive and challenging computer experiences. However, those who view themselves as inept at using the computer are likely to expect negative experiences with the computer (Oliver & Shapiro). Oliver and Shapiro concluded that the "degree of self-efficacy determines how much a person is willing to try, and to cope with a situation or task." (p. 82).

Hill et al. (1987) conducted a study in which they measured efficacy beliefs (i.e., the belief that he/she can is able to master a particular behavior).
and instrumentality beliefs (i.e., beliefs that performing the behavior will lead to desired outcomes). They found that computer efficacy beliefs influenced the decision to use computers independent of instrumentality beliefs. In their model, computer efficacy beliefs and instrumentality beliefs individually predicted behavioral intentions, and behavioral intentions predicted behavior. Therefore, computer usage will be increased if there is a belief in one's ability to master the use of computers, and/or the belief that benefits will be gained from being able to successfully use the computer.

In summary, from the literature above it can be seen that using computers in a training program can have many benefits. However, due to their interactive nature, computers add a unique factor in predicting training outcomes. Computer anxiety and lack of computer self-efficacy have been shown to have a negative effect on desire or motivation to use computers. It can be hypothesized from the literature that trainees who are low in computer confidence will be less motivated to use computers and, therefore, feel less confident about the success of their learning from the computer and subsequently less motivated to attempt to transfer learning back to the job setting.

**Training Attitudes.** Training attitudes are position or emotional states that trainees have developed towards training. Training attitudes indicate levels of favorable or unfavorable feelings about training. Mager (1984) describes attitudes as predictions. In the context of approach and avoidance of learning, Mager suggested that favorable attitudes are predictive of "moving toward"
responses and conversely, negative attitudes are "moving away" from responses.

Attitudes about training have been shown to be predictive of success (Ryman & Biersner, 1975). Ryman and Biersner administered a 25-item questionnaire to measure attitudes about training motivation, leadership, and course expectations in regards to a diving training course in the Marines. They found that attitudes of confidence about training was identifiable and valid for predicting success in two of the training groups. Based on their findings in the diver training, they concluded that under conditions in which failure during training occurs, specific attitudes toward training can be used to predict who will succeed and who will fail.

Hicks and Klimoski (1987) examined the effect of trainee's attitudes about training. Hicks and Klimoski conducted their study as a field experiment to determine how the degree of choice over what training to take, and how a realistic preview of training programs, versus an overly optimistic preview, affected trainees' attitudes about the training and the effect of those attitudes on training outcomes. Previews were written announcements of training programs. The realistic previews included a number of neutral and unfavorable statements, while the traditional preview was overly positive. Hicks and Klimoski posited that if trainees are given realistic information about the training program, the trainee can see how training fits with his/her needs. Therefore, they should be able to determine if the training is a good match. If the trainee feels the match is good,
they should have a heightened desire to learn, which is a precondition for effectiveness of training programs (Porter et al., 1975).

Results (Hicks & Klimoski, 1987) indicated that trainees who received the realistic training preview and those who had a high degree of choice were more likely to perceive the workshop to be appropriate for them to take and were better able to profit from training. In addition, they were also more committed to their decision to attend the training than trainees who received the traditional all-positive announcement and had a low degree of choice. Those trainees who were given a high degree of choice were more satisfied than those who had low choice. Those trainees who either received the realistic announcement or had a high degree of choice reported higher motivation to learn than did the other trainees. Type of pretraining information did not have an effect on the learning measures. However, the degree of choice had a main effect on two of three learning measures.

In contrast to Hicks and Klimoski (1987), Karl and Ungsrithong (1992) tested the hypotheses that an informative and optimistic training preview would help trainees see the relevance of the training program to their jobs and also increase outcome expectations, self-efficacy, motivation, learning and transfer. Their sample was divided into two groups. Both groups were given the same basic information about the training program, with the exception that the realistic preview group also heard negative information about such problems as large group size, lack of individual feedback from the instructor, and difficulties in transferring learning. Findings indicated that subjects receiving optimistic
training preview had more positive outcome expectations, greater motivation to learn, positive reactions to training, greater transfer of learning (self-reported), and more positive posttraining attitudes towards using skills presented in the training program than the group whose pretraining information included negative information. These findings lend support to the hypothesis that a positive attitude towards training may increase motivation to transfer.

The differences between findings in the study by Hicks and Klimoski (1987) and the study by Karl and Ungsrithong (1992) may lie in the way negative information was presented. Hicks and Klimoski used written previews and Karl and Ungsrithong used oral presentations. It cannot be determined how much emphasis was placed on the negative aspects of the training in the preview information used in either study.

In looking at trainees who are more likely to adopt the management methods taught in management training courses, Baumgartel et al. (1978) tried to identify personal orientations or personality characteristics that were predictive of innovative or adoptive behaviors. From their study they developed what they termed an "adoptive disposition" (p. 6). One of the characteristics of the person who is most likely to apply new knowledge is that the person believes in the value of training. It can be reasoned from these findings that a person with an "adoptive disposition" has a positive attitude towards training and is more motivated to transfer the skills and knowledge gained in training than a person who does not have an "adoptive disposition".
These four studies lend support to the hypothesis that training attitudes can be predictive of training outcomes. In addition to these studies, theory also supports the development of attitudes about training that can affect the effectiveness of training.

Howard (1989) expanded the expectancy motivation model to a dynamic process model. Howard's model incorporates the concept of feedback loops. His model takes into account previous experience. The model describes an expectancy-to-performance link; performance-to-reward link; and a reward-to-needs satisfaction link. He posited that a break-down in any of the steps in the expectancy model can lead to lowered motivation and lowered effort.

Following Howard's (1989) dynamic model, it can be seen that attitudes about training can develop from prior training experience in the organization and affect motivation. Based on their experiences in training and how their expectations about training were met, attitudes about training can develop.

Attitudes about training can also be fostered by the views of management. Gill (1989) wrote that in many organizations training and development activities are not considered critical to the successful operation of the business by management. The training function is merely tolerated by managers because they view training as either a staff benefit or a means to remedy a skill deficit for particular employees. Management often has little awareness of what is achieved through enhancement of skills and knowledge which leads to the placing of less value on training and development programs than they do on other corporate functions (Gill, 1989). Employees may take
their cue from management about the importance of training and therefore, develop general attitudes about training that reflect those of management. McGehee and Thayer (1961) wrote, "If the superior is not concerned with how well a subordinate learns his job duties, the subordinate, himself, will not be overly concerned" (p. 18).

Similarly employees may develop training attitudes based on the attitudes from more experienced workers within his/her work group. Group norms are informal rules that groups adopt to regulate and regularize group members' behavior (Hackman, 1976). In other words, the work group that a trainee comes from can influence trainees' attitudes toward training. If negative, work group attitudes may depress trainees' expectations of training; or if positive, may heighten trainees' expectations of a training program.

It can been seen that past experience and attitudes about training of management and peers can influence attitudes that trainees have toward training before a training program begins. These attitudes can influence trainees motivation to learn and to transfer training.

Reaction

Trainees' reaction to training is the first level in Kirkpatrick's (1994) four-level evaluation design. Kirkpatrick called it a measure of customer satisfaction. There is some controversy in the training literature as to the nature of reaction. Kirkpatrick views reaction as an outcome, whereas, Holton (1996) views reaction as having a moderating role between motivation to learn and learning. Mathieu, Tannenbaum, and Salas (1992) found that reaction serves
as a moderator of the relationship between training motivation and learning, as well as, acting as a mediator of other relationships.

Trainee's reaction is the most easily obtained information in the evaluation process. Therefore, it is the most often used measure in training evaluation (Sadowski, 1995).

Although trainee reactions are the most often data collected to evaluate training, there does not seem to be a standard guideline of what exactly constitutes "reaction". Geber (1995) called "smile sheets" the most primitive level of evaluation. Smile sheets are used at the end of training courses and are so termed because they measure enjoyment of the course. The rationale behind assessing trainees' enjoyment of training is based on the assumption that if a person enjoys training they will learn more. However, Holton (1996) pointed out that learning can be often confusing and frustrating.

Dixon (1990) tested the relationship between trainee responses on participant reaction forms and posttest learning scores. Her study was conducted with 1,200 employees in three courses of mandated training to facilitate the adoption of a new manufacturing process. This study measured the trainees' reaction to (a) the relevance of the course, (b) perceptions of their own learning, (c) their enjoyment of the training, and (d) the skill of the instructor. Dixon found no significant relationship between trainees posttest scores and any of the four reaction measures.

Clement (1982) in an attempt to test Hamblin's (1974) evaluation model conducted a pretest-posttest control group design study. The experimental
group included 50 first-level supervisory employees in state government. The control group included 21 of their peers who were scheduled to take the training at a later date. Reaction was measured at the end of the last day of instruction by trainees indicating how much they agreed with each of 16 statements focusing on the relevance of the course to their jobs and organization. Trainees' reaction was hypothesized to be positively related to the improvement in scores on the multiple-choice test of knowledge. Support was found for the hypothesis that reactions were positively related to learning.

Warr and Bunce (1995) identified three conceptually separate kinds of reaction: reported enjoyment, usefulness, and difficulty. The extent to which trainees find a program enjoyable is often used as a form of subjective evaluation. However, Warr and Bunce believed there to be no theoretical rationale for expecting that enjoyment will be related to either learning achievement or changes in work behavior. They proposed that perceived usefulness would focus on the potential applicability of the material in the person's job. The third type of reaction that they discussed was perceived difficulty of the training. It was speculated that this type of reaction would predict immediate learning.

Warr and Bunce (1995) conducted a study of junior managers from a number of sites in a single British organization. The learning context was a 4-month open learning program. Immediately after the training, trainees were measured on the three forms of reaction described above through mailed questionnaires. Significant bivariate correlations were found for both general
attitude towards training and specific motivation with reported enjoyment and usefulness but not with perceived difficulty.

Mathieu, Martineau, and Tannenbaum (1993) proposed and tested a model that included training reaction, measured as enjoyment of the course. They hypothesized that mid-course efficacy would have a positive linear relationship with training reactions and subsequent performance, and an interactive relationship with performance, when training reactions were considered as a moderator. The subjects in the study were participants in 15, 8-week long university bowling classes.

Results from the Mathieu et al. (1993) study showed that choice did not have a significant effect on reactions to training, nor was the linear relationship between training reaction and performance significant. Additionally, there was no support for the hypothesized interaction between self-efficacy and reactions, as related to performance improvement. Additionally, support was not found for a moderated relationship between reactions and mid-course self-efficacy, as related to performance.

Perhaps some of the conflicting results surrounding reaction stems from the different concepts that have been included in the reaction measure in past studies. In addition, the different settings for the studies may have had a bearing on the lack of agreement. Dixon's (1990) study was mandated technical training, whereas, Clement's (1982) was supervisory training on soft skills such as communication. Mathieu et al.'s (1993) study was more enjoyment oriented.
and was conducted in a college bowling class where the outcomes may not be have been as crucial as in a work setting.

Two areas of the trainees' reaction, reaction to the physical training environment and trainees' perceptions of the content validity, will be reviewed here. Due to the nature of the training, these two variables were thought to be particularity relevant as will be discussed below.

**Learning Environment.** The physical conditions in which trainees must attempt to learn the information presented may affect how much they learn, how much they enjoy the learning experience, their general satisfaction level with training and thus their motivation to use training. The CBT in this study was completed in the control room or work area of the unit. Due to this nontraditional training setting, some of the particular concerns were the effect of the lighting, noise levels, and time pressures on the participants' ability to benefit from the training.

Learning environments should be planned to maximize the inherent opportunities for learning (Finkel, 1990). Finkel stressed the need for an environment to provide: a transition from outside pressures; a setting that improves concentration of participants; elimination of distractions; a degree of privacy; and permits relaxation and exercise. Finkel was describing the more traditional learning environment rather than a computer-based training situation. However, if these issues are important for learning to be maximized, then the physical environment of a CBT program that is incorporated into the work space
and is to be used when work demands permit, could hinder some trainees' acquisition of knowledge and skills.

Adult learning theorists stress the importance of an environment that is safe and comfortable for adult learners (Zemke & Zemke, 1995). Adults are thought to learn better when they have the appropriate levels of light, sound, heat, and cold (Knowles, 1984; Zemke & Zemke, 1995). Adequate lighting and noise levels that allow for the ability to focus should be especially important in a CBT program in which the computer is located within the work unit.

From the study of ergonomics, it has been recognized that the fit between the person, the work environment, and the machines used is important for the effectiveness of task completion. Although, humans can adapt to less than optimal conditions, there is a limit to the amount of adaptation a person may be willing to make (Galer, 1987). Galer, stressed the importance of lighting and noise levels in the physical environment for task performance. Bates et al. (1996a) reported that lighting and physical arrangements may be especially important for adult learners using CBI. For example, with the physical changes in eye sight that naturally occur as the result of aging, better lighting may be needed in order for the learner to be able to read the screen. If it is hard for the learner to see the screen or concentrate due to the noise, he/she may avoid using the CBI or develop a poor attitude about the training.

When the learning causes discomfort, this discomfort may transfer to the learning process itself. Trainees may avoid the learning situation unless their motivation to learn is high enough to ignore the discomfort (Mager, 1984).
In summary, the physical learning environment should be comfortable for
the trainee and be conducive for learning in order for the trainee to gain the
maximum benefit from the training program. CBT conducted in the work setting
presents special problems that may hinder the trainees attention to the training
session. Although the trainee may be able to adapt to a certain amount of
adverse conditions, further research is needed to determine the effect of the
physical environment when CBT is conducted in a work setting.

Content Validity. Content validity in a training program, refers to the job
relatedness of the training program. The purpose of training is to instill
knowledge, skills and abilities necessary for effective job performance (Ford &
Wroten, 1984). It was noted by Goldstein (1980) in his review of training
literature that no procedures existed that empirically evaluated the content
validity of an established training program.

Training content should be dictated by the behavioral objectives of the
training program and is composed of the knowledge and skills the trainee must
master in order to perform the objectives (Campbell, 1988). Training evaluation
should be centered on the degree to which these training objectives have been
met (Campbell, 1988).

Adult learners learn best when they can see the relevance of the
materials being taught to an immediate need they have (Knowles, 1984).
Therefore, the content becomes valid to them when they can see how it will
benefit them. Knowles, proposes that "adults are motivated to devote energy to
learn something to the extent that they perceive that it will help them perform tasks or deal with problems that they confront in their life situation" (p. 59).

McGehee and Thayer (1967) pointed to the need for training materials to be rich in association and easily understood. McGehee and Thayer wrote that "in general, meaningful material is learned and remembered better than material which is not meaningful" (p. 162). Adult learners have greater numbers of experiences to draw on (Knowles, 1990). It can be reasoned that adult learners or more experienced workers are in a better position to judge, or perceive themselves to be in a better position to judge the meaningfulness of the materials in a work related training program.

Often it is the trainees' perceptions that affect motivation. In Clement's (1982) study, support was found for trainees' reaction to the relevance of the training material increasing learning. Research has shown that trainees who are given a choice of training are more highly motivated to learn, provided they receive their choice (Baldwin, Magjuka, & Loher, 1991). It may be that trainees who decide on their own training are more likely to perceive the training as relevant to their job than those who receive mandated training. Garavagli (1993) proposed that the two most likely reasons that learning doesn't transfer to the job are the work environment is not supportive of the learned behavior and trainees think the training was irrelevant.

In summary, trainee's perceptions of relevance of the content of training information may affect the trainee's motivation to learn the material and then to transfer the learning to the job setting. This is especially true of adult learners.
because they are oriented toward learning information that they perceive to be beneficial or usefulness to them in the immediate or near future.

Learning

The "learning experience" is undertaken with the expectation that the student or trainee will be modified in some way. The learner is expected to gain skills and knowledge and/or their attitudes and beliefs will be changed (Mager, 1984). If these objectives have been accomplished then learning has taken place.

Learning is an outcome in all training evaluation models. McGehee and Thayer (1967) stated, "The central process in industrial training is learning" (p. 126). They further explained that when a training program is established and implemented for employees, it is done with the expectation that the experience in the training program will modify the behavior of the participants.

Kirkpatrick (1994) gave three things that can be taught in training programs: knowledge, skills, and attitudes. He stated that to evaluate learning it must be determined "What knowledge was learned?; What skills were developed or improved?; and What attitudes were changed?" (p. 42).

Holton's (1996) model specifies learning outcomes as having an influence on motivation to transfer. In addition, motivation to transfer moderates the relationship between learning outcomes and performance. Findings from Tannenbaum et al. (1991) found that trainees who scored higher on performance tests during training had higher posttraining motivation, which supports Holton's hypothesized link between learning and motivation to transfer.
Vroom's (1964) expectancy theory also supports the link between learning and motivation. Expectancy theory indicates that individuals will be more motivated when they believe that their efforts will lead to enhanced performance. Holton reasoned that more successful learners would perceive themselves as better able to perform and, therefore, would be more motivated to transfer.

Several studies have been mentioned earlier that examined the link between motivation to transfer and learning. Baldwin and Ford (1988) found generalization and maintenance (transfer) to be influenced by learning. Huczynski and Lewis (1980) reported that motivation to transfer learning was determined to a large extent by the degree to which a participant valued the course attended and the learning gained. Rouiller and Goldstein (1993) found that learning in training was significantly related to transfer behavior. Xiao (1996) in a study conducted in electronics companies in China, found that trainees perceived learning as having contributed to their better performance in the work place. Much research and theory seems to support the link between learning and motivation to transfer.

Environmental Factors

Environmental factors include the organizational climate and constraints or aids that a trainee must deal with when they return to the job after completing a training program. In relation to motivation to transfer, it is the trainees' perception of the environment and what he/she expects to have to deal with when they return to the work setting that has an influence. Each organization
has its own organizational climate. Prichard and Karasick (1973) defined organizational climate as:

"a relatively enduring quality of an organization's internal environment distinguishing it from other organizations; (a) which results from the behavior and policies of members of the organization, especially top management; (b) which is perceived by members of the organization (c) which serves as a basis for interpreting the situation; and (d) acts a source of pressure for directing activity" (p. 127).

Schneider (1975), after reviewing the literature concerning climate perceptions impact on behavior, suggested that individuals seek information from their work environment to give them cues about behaviors required by the organization that will help them attain a homeostatic balance with their environment. Schneider also stated that it might be hypothesized that climate perceptions are functional because they provide a frame of reference. For example, changes in practices and procedures may be met with resistance because they do not "fit" in with the perceived climate. Schneider and Reichers (1983) stressed the importance of perception in both motivational and climate approaches to understanding behavior at work. Work settings have numerous climates, but climates must be attached to a referent in order for them to be meaningful (Schneider & Reichers, 1983). An example would be training transfer climate or a safety climate.

In this study, transfer climate is defined as the organizational climate that influences the transfer of training by serving as a frame of reference that sends
messages or signals to employees as to what is important and what "fits" the organization in regard to the use of training back on the job. Experienced workers may have developed perceptions of the transfer climate prior to a training program. The preconceived judgements about the transfer climate would then influence transfer motivation.

Even though a trainee may leave training with a strong intent to use skills and knowledge learned in training, the actual transfer may be limited by the posttraining environment to which the trainee returns (Tannenbaum & Yukl, 1992). Tannenbaum and Yukl posited that "elements of the posttraining environment can encourage (e.g. rewards, job aids), discourage (e.g. ridicule from peers), or actually prohibit the application of new skills and knowledge on the job (e.g. lack of necessary equipment)" (p. 420).

**Supervisor Support, Supervisor Sanctions, and Peer Support.** The environmental factors of supervisor support, supervisor sanctions and peer support often are part of what is referred to as transfer climate. Several research studies have been conducted which included testing to determine if work environment factors had an influence on whether trainees implement the learning they gained in training programs back on the job. A few studies have examined the effects of supervisory support and/or sanctions and peer or group support on motivation or transfer of training. Those previously discussed under motivation to transfer include: Baumgartel et al., 1978; Baldwin & Ford, 1988; Clark et al., 1993; Facteau et al., 1995; Huczynski & Lewis, 1980; and Noe & Schmitt, 1986.
Generally, support has been found for the influence of supervisors and peers. Huczynski and Lewis (1980) found that 71 percent of the beneficial results of the training occurred when the transfer was supported. The largest percent (70 percent) of these benefits were supported by superiors. In the Facteau et al. (1995) study only supervisory support was positively related to pretraining motivation. Clark et al. (1993) found support for anticipated supervisory transfer climate affecting training motivation through job utility. Clark et al. did not, however, find support for the hypothesis that anticipated peer transfer climate would affect job utility and, thus, motivation.

One of the first studies to draw attention to the effect of supervisory influence on transfer of training was done by Fleshman (1953). His study was an attempt to evaluate a leadership training course for foremen after the foreman returned to their industrial work settings. It was found that the kind of boss under whom the foremen themselves had to operate made a difference in whether or not they used their training. Fleshman stated that findings from his study implied "that if the old way of doing things in the plant situation is still the shortest path to approval by the boss, then this is what the foreman really learns" (p.215). His belief was that existing behavior patterns are molded by and are part of the culture of the work situation. In the situation in his study, he exerted that to produce changes in the foremans' behavior, it would be necessary to also change their "back-home-in-the-plant" environment.

A stream of research headed by Baumgarten (Baumgarten et al., 1972; 1978; 1984) examined the effect of organizational climate on transfer of training
from management training. All the studies conducted by Baumgartel and his associates used survey research methods. The measure of transfer was assessed by self-report questionnaires.

The first study reported on training that took place in India, and found that organizational climate was the single most important factor affecting the efforts of trainees to apply new knowledge in the back-home setting (Baumgartel et al., 1972). Although in this study the authors concluded that their findings provided only sketchy evidence, it was apparent that personal value orientations and motivations does play a significant role in transfer of training.

The second study (Baumgartel et al., 1978) was conducted in the United States and the United Kingdom. This study confirmed the Indian study's findings that there are people with personality characteristics that are more likely to adopt or transfer new skills back on the job. People with these characteristics are labeled as having an "adoptive disposition". As discussed earlier, a favorable climate enhanced the adoptive (transfer) efforts of the people who adopted the new skills, but a favorable climate also produced a relatively larger proportion of persons high in adoptive disposition (Baumgartel et al., 1978). This finding lends support to the idea that perceived supportiveness of the transfer climate can affect motivation to transfer since those persons from a favorable climate are more likely to be predisposed to use training on the job than those from a less supportive climate.
The final two studies reported on by Baumgartel and his associates (Baumgartel et al., 1984) gave support to the findings from the previous two studies. The organizational environment into which trained managers return after training affects the extent to which they will apply new skills and knowledge learned in training. The most favorable climates were characterized by: high appreciation for performance and innovation, a climate of freedom, a rational reward system, and openness in relationships among managers (Baumgartel et al., 1984).

More recently, a study by Rouiller and Goldstein (1993) and a study by Tracy et al. (1995) have focused on transfer of training. These studies do not address the issue of motivation to transfer directly. In these studies behavior or performance changed as a result of the training, therefore, it is reasonable to believe the trainees were motivated to transfer the training.

Rouiller and Goldstein (1993) tried to develop and test an instrument to measure transfer climate. The main question of their study was whether an organizational transfer climate existed on the job that helped to determine if behavior learned in training was actually used in the job situation. The main hypothesis of organizational transfer climate being significantly related to transfer behavior was supported (Rouiller & Goldstein, 1993).

Although the Rouiller and Goldstein (1993) study is important in that it supports the role that organizational climates play in transfer of learning, one area that was not addressed due to the nature of the training program was the effect of perceived transfer climate on motivation to transfer when trainees are
experienced employees. This study was conducted with newly hired trainees, therefore they had no preconceived perception of the transfer climate before entering the training program. Prior knowledge of the transfer climate into which they would return to use the training could have influenced their motivation to learn as well as their motivation to use the training and thus their transfer behavior (Tannenbaum & Yukl, 1992). Transfer climate was based on a unit perception not on the perception of the individuals in the study.

Building on the Rouiller and Goldstein (1993) study, Tracy et al. (1995) conducted a study with 505 managers from 52 supermarkets who had participated in a voluntary training program on basic supervisory behaviors and skills. Their study tried to provide new insight into the issues left unanswered by Rouiller and Goldstein concerning the effect of transfer climate on experienced workers.

Results of the Tracey et al. (1995) study showed that both knowledge and supervisory behavior increased significantly from the pre-test to the post-test scores. Transfer of training climate had direct effects on posttraining behavior. Their study showed that both experienced and new employees transfer of training can be influenced by the organizational transfer climate.

Xiao (1996) in a study conducted in China with electronics companies looked at the human aspect variables on trainees' perceptions of transfer of training. Although peer support was significant, supervision assistance had a stronger influence.
Ford, Quinones, Sego and Sorra (1992) put forth the idea that not all trainees have the same opportunity to perform the task learned during training. This lack of opportunity to perform task impedes transfer of training. They included supervisory attitudes towards the trainee and work group support among the factors within the work context that affect the trainees' opportunity to perform. Ford and his associates hypothesized that supervisors may provide more guidance and opportunities to use training for employees, if they perceive the trainee as more likable and with high skill and career potential than those trainees who are perceived less favorably. They also suggested that when in highly supportive work groups, trainees may feel more comfortable using their new skills and knowledge. Ford et al.'s study conducted with graduates from an Air Force technical training program and their supervisors (N=180), found support for trainees having more opportunity to perform task learned in training when supervisor's perceptions of the airmen's capability, skills, and likability are favorable. Additionally, airmen who were assigned to work groups that were highly supportive were found to have performed the more complex and difficult types of task.

In summary, it can be seen that supervisors and peers play an important role in transfer of training. Since trainees often form some perception of how training will be supported by supervisors and peers before entering training programs, it can be reasoned that these perceptions can influence motivation to learn and motivation to transfer. In mandatory criterion based training, where the trainees are required to score at a certain level or repeat the training,
transfer climate may have a greater effect on motivation to transfer than
motivation to learn. Supervisory actions taken after one training course may
become the cues for subsequent training courses (Tannenbaum & Yukl, 1992).
Thus, when organizational training becomes a continuous learning process
feedback loops enter to affect motivation.

**Opportunity to Use.** As used in this study, opportunity to use includes
having the resources, tools, and information that allows them to use the training,
as well as being allowed to use the training even if others do not. Peters and
O'Connor (1980) developed a list of situational constraints. They included in
their list of situational resource variables relevant to performance: job-related
information; tools and equipment; materials and supplies; budgetary support;
required services and help from others; task preparation; time availability; and
work environment (noise level, temperature, lighting, safety, etc.). They outlined
hypotheses regarding situational factors predicted to interfere with the
translation of individual ability and motivation into effective performance.

Peters, O'Connor and Eulberg (1985) extended Peters and O'Connor's
(1980) work. They reported on a series of investigations they had undertaken
to examine situational constraints, along with research done by others with
related objectives. They regarded constraints as the work factors which were
identified as inhibiting performance rather than the persons who were identified
as being responsible for the presence of those work factors. They reasoned
that if a worker's performance was subpar due to a supervisor failing to provide
sufficient information, the constraint was the lack of information (the event)
rather than the supervisor (the agent). They proposed 7 hypotheses concerning the influence of situational constraints. One of the hypothesis is relevant to the present study: "Relevant individual differences in abilities and motivation are hypothesized to interact with situational constraints in the prediction of performance" (pp.96-99).

O'Conner, Peters, Pooyan, Weekley, Frank, and Erenkrantz (1984) conducted a field investigation to test the impact of situational constraints on performance, affective outcomes, and turnover. Their research was conducted within a large sample of 1,450 employees from three managerial levels of a national convenience store organization. Measures included performance, satisfaction, frustration, and situational constraints. Higher situational constraints tended to be associated with lower employee performance. Also the presence of situational constraints was associated with employees expressing greater dissatisfaction and frustration.

As discussed earlier Mathieu et al. (1992) included situational constraints in their hypothesized model of training effectiveness. Their study, in which proofreading skills were tested with university employee, perceived situational constraints were found to have a marginally negative effect on training motivation.

A study by Facteau et al. (1995), also reviewed earlier, used structural equation analysis to determine if task constraints in the work environment had an impact on pretraining motivation and training transfer. They did not find support for task constraints having a negative impact on pretraining motivation.
or training transfer. They explained this lack of support by referring to study a by Peters et al. (1985) who noted that, in general, laboratory experiments are likely to show a relationship between constraints and performance, but in field studies often the presence of task constraints are not strong. Based on the standard deviation in their sample, they concluded that trainees did not believe that severe constraints were present in their work environment.

In summary, it can be seen that situational constraints can have a negative influence on work performance. It would follow then that situational constraints could affect the performance of newly learned tasks and/or procedures. In fact, a new task or a changed procedure may attenuate the problem because a new task or procedure may require different or new information, tools and equipment, materials and supplies, etc., which may not have been made available to support the transfer of training. Prior knowledge of situational constraints before training could also affect training motivation.

Summary

With rapidly increasing technology and fierce global competition, training has rapidly become an important function of business as a tool to increasing productivity. As businesses are reorganizing and downsizing in an effort to be more efficient, HRD departments have come under increased pressure to show that training is effective and contributes to the productivity of the organization (Holton, 1996). A major breakdown in the training-to-performance link appears to be occurring with some estimates as low as 10 percent of training actually being applied to the job (Brinkerhoff, 1989; Huczynski & Lewis, 1980). This link
has been termed "transfer of training". The critical question then becomes "why" is there a failure to transfer training. One promising avenue is lack of motivation to transfer training.

Motivation in work organizations has long been studied (Campbell & Pritchard, 1976; Lawler, 1994; Lawler & Suttle, 1973; Porter et al., 1975; Steers & Porter, 1991; Vroom, 1964; Vroom & Deci, 1970). However, there is a lack of research that has examined factors that contribute to motivation to transfer. Holton's (1996) model holds promise for guiding research to evaluate training because it goes beyond the outcomes of training and specifies antecedents to the outcomes. Motivation to transfer is shown as a major influence on individual performance. According to the model, individual performance may be increased by raising motivation to transfer. In order to increase motivation to transfer, it is imperative that the factors that influence motivation to transfer are understood.

Factors that were reviewed in the preceding literature review are hypothesized to influence motivation to transfer, either directly or indirectly, through their effect on learning. Although some of the variables have not been previously tested empirically in relation to motivation to transfer, support was found for including them in the analysis.

Empirical research has looked primarily at reaction, learning, and transfer climate/environment as affecting performance. The support for reaction to training has been mixed and the definition of training reaction has varied. Support has been generally strong for learning and transfer climate/environment
on performance. Although many studies have not included motivation to
transfer in their model, the importance of motivation on the transfer process has
been recognized.

Organizational commitment has mostly been studied in the context of its
influence on performance. The effect of organizational commitment on
performance has been inconclusive. Facteau et al. (1995) did find that
organizational commitment had an influence on pre-training motivation. Further
research is need to determine the effect of organizational commitment on
motivation to transfer.

Although little empirical research was found relating love of learning,
attitudes toward training, and computer confidence to motivation to transfer,
strong theoretical support was found for including these variables in the
analysis. Noe (1986) stressed the need to examine trainee’s attitudes,
interests, values, and expectations in explaining training outcomes. Facteau et
al. (1995) developed a training model that incorporated the effects of
employees’ attitudes and beliefs about the training in general on pretraining
motivation and perceived training transfer. Empirical testing of these variables
are needed to determine their effect on motivation to transfer.
CHAPTER 3: METHODOLOGY

This study was done as part of a larger project titled "Evaluation of a Computer-Based Training System for OSHA Safety and Plant Operator Training" funded by a grant from a large petrochemical company in the state of Louisiana. The grant contract's primary requirements were the development and implementation for an evaluation of a recently instituted CBT program and to make recommendations for improvements.

The major impetus for the training program was to provide an effective and cost efficient means of training and testing production employees in the different work units (separately housed divisions where different chemicals are produced) on standard operating procedures (SOPs) and safety procedures in order to fulfill requirements for mandated training under the OSHA 1910-119 (the so-called Bhopal Law). The law provided that personnel involved in the manufacture and use of highly hazardous chemicals must meet stringent training and certification criteria. OSHA 1910-119 provided three areas of mandated training:

(1) Initial training. All production employees involved in the production and use of hazardous chemicals are required to complete initial training, testing and certification covering the background of all production processes in the plant and job-specific training which included process, safety, and environmental training. It was required that this training be completed by May 15, 1995.
(2) Refresher training. Every three years all production employees are required to have refresher training. They are re-trained, tested, and re-certified in the areas as specified under initial training.

(3) Management of change. If an operating procedure or other process in the production cycle is changed, all parties affected by the change must be trained, tested and certified with regard to that change before the affected employees can perform that procedure or process.

In order to meet the requirements of the OSHA statute, the organization investigated a means of satisfying short-term and long-term training needs. In the short-term they needed to provide the initial training, testing and certification by May 15, 1995 with as little job-loss time as possible. In the long-term, they needed to be able to provide continuous initial training for new hires and refresher training for those previously certified. In addition, they needed a means of continuously alerting employees to system updates, and a timely method of providing training, testing, and certification of employees on procedures and process as changes occurred.

They determined that a computer-based information management and training system would best meet their needs. A design team was formed from plant operations personnel. Using a CBT authoring package, the design team developed a computer-based training system. Selected employees from each of the units helped write the SOPs and corresponding tests for their particular unit. The design team then incorporated the SOPs and tests into the training system that could be accessed in 20-minute lesson segments.
CBT modules were installed in each of the units. The employees were able to access the lesson segments during on-shift free time that occurs in the normal production cycle. Thus, training changed from traditional day-long classroom sessions, usually completed on overtime, to twenty minute computer-based sessions completed during normal working hours. The CBT system virtually eliminated the expense of overtime for this type of training, as well as scheduling problems associated with training large groups of employees in a traditional classroom setting.

Implementation of the CBT system began in January, 1994. Employees were given control of the timing, sequencing, and pace of their training. Each employee could access on the computer a list of the tests he/she needed to complete in order to become certified for their particular job. The tests had to be completed correctly at the 80 percent criterion level. As the employee completed each required lesson and passed the corresponding test, the test score was recorded and the test was automatically taken off the need-to-take list. Tests remained on the list until the employee completed the test at the 80 percent correct level. The employee could take the test as many times as needed. If a procedure changed, the test for certification were added to the need-to-take test list for those employees affected by the change.

The primary task of the evaluation team was to determine the effectiveness of the CBT system and give recommendations on ways in which training effectiveness could be increased. Toward this end, an evaluation process was designed and implemented by a three-person evaluation team from
Louisiana State University. The author was a member of this team. The data used in this study is a portion of the data collected for the larger project.

Subjects

Subjects for the present study were production operators and supervisors from two production units, the Hydrogen Cyanide (HCN) unit and the Herbicide Production Facility (HPF) unit who received the computer-based training. Although three units had participated in the CBT, only HCN and HPF would agree to participate in the study. Production operators are responsible for monitoring, operating, and maintaining the production equipment used to produce specific chemical products. Each shift had a supervisor who was responsible for overseeing the operations of the unit during his/her shift. Both operators and supervisors were required to complete from 36 to as many as 550 training modules depending on their job responsibilities in their specific unit.

Instrumentation

All survey instruments in this study used a Likert-type scale with answers ranging from (1) strongly disagree to (5) strongly agree. Factor analysis were performed on the survey instruments using the sample from the larger study. Several of the subscales resulting from the factor analyses on the larger population were used to measure variables in the present study. For a complete discussion of the instrument development and factor analysis refer to the technical report, Evaluation of a Computer-Based Training System for OSHA Safety and Plant Operator Training (Holton et al., 1996). The subjects in the present study were a sub-group of this larger sample.
Dependent Variable

Motivation to transfer. The measure for motivation to transfer was determined by an 8-item scale. This subscale was derived from a factor analysis of the survey instrument titled "Reaction" (see Appendix A), which was developed by the evaluation team.

All items on the subscale had loadings above .50. Items in this scale (see Appendix B) included, for example, "I plan to use what I learned on the job", "Because of the training, I understand better why it is important to do certain procedures as specified in the SOPs", "I believe the training will help me do my current job better". The reliability of this scale was estimated using the SPSS statistical package and has an alpha of .89, which is well above Nunnally and Bernstein's (1994) suggested .70 level of reliability.

The justification for using this scale as a measure of motivation to transfer came from several sources. Noe (1986) suggested that performance utility moderates the relationship between learning and behavior change, therefore, perceived usefulness is an integral part of motivation to transfer. Huczynski and Lewis (1980) used the trainees' perception of the usefulness of the training to gauge motivation to transfer. Kanfer (1987) included perceived performance-utility as a factor in the decision to use training. Locke (1968) stated that behavioral choices are regulated by behavioral intentions. Considerable evidence supports the hypothesis that intentions are highly correlated with behavior (Hill et al., 1987; Latham, Saari, Pursell, & Campion, 1980; Locke, 1968). Additionally, adult learning theory holds that adults are
more motivated when they perceive learning to be helpful to them in performing tasks or solving problems (Cohen, 1990; Knowles, 1990). Similarly, expectancy theory (Vroom, 1964) suggests that motivation is positively associated with an individual's expectancy that effort will lead to performance and performance to an expected outcome. This scale was originally entitled "Performance Utility" (Holton et al., 1996). It was used as a measure of motivation to transfer but was entitled "Performance Utility" in a recent study (Bates, 1996).

In summary, motivation to transfer includes perceived usefulness of the training and an intent to use. This measure of motivation to transfer included both a statement of intent to use and several items related to the usefulness of the training.

**Independent Variables**

**Love of Learning.** The Love of Learning scale was measured with a 13-item subscale derived from a factor analysis of Guglielmino's (1977/78) 58-item Self-Directed Learning Readiness Scale (SDLRS). The title of the instrument was changed to Learning Survey (Appendix C). All items on the subscale had loadings of .40 or greater. The reliability estimate on this sub-scale was alpha =.91.

A list of the Love of Learning scale items can be found in Appendix D. Sample items included: "The more I learn, the more exciting the world becomes", "Learning is fun", "I want to learn more so that I can grow as a person", "I have a strong desire to learn new things", and "I will never be too old to learn". The concept of love of learning, as used in this study, embodies the
intrinsic reward that a person receives from the act and process of learning new things.

**Internal Work Motivation.** The 3-item scale used to measure internal work motivation was developed by Hackman and Lawler (1971) (alpha = .72). In this study, this scale was included with several other scales that were intended to measure different job attitudes (Appendix E). A factor analysis was performed and the 3-item subscale was confirmed. All items had loadings greater than .50. The reliability estimate had an alpha of .79.

The items included in this scale were: "I feel a great sense of personal satisfaction when I do my job well", "Doing my job well increases my feelings of self-esteem", and "I often feel really good about the quality of my work performance" (Appendix F).

**Organizational Commitment.** Organizational commitment was measured using an 11-item subscale derived from a factor analysis of the Job Attitude Instrument (Appendix E). The 11-item subscale included the 9 items from the Organizational Commitment Questionnaire (OCQ) (Mowday et al., 1979) and two additional items (items 1 & 2) from the Job Satisfaction scale developed by Hackman and Oldham (1975). This factor structure of the Job Attitude Instrument suggested that job commitment and job satisfaction are so closely related in this work environment that the job satisfaction items did not have enough discriminate power to separate the two constructs.
The 9-item OCQ has been shown to have good reliability (alpha = .84 to .90) when used previously (Mowday et al., 1979). The 11-item scale used in this study had internal reliability estimates of .90. All items had factor loadings greater than .40, except item 9 which had a factor loading of .39. Item 9 was included in the reliability estimates and the analysis showed that dropping it would lower the alpha, therefore, it was retained in the scale.

Examples of the items included in the scale were: "I am proud to tell others that I am part of this organization", "I really care about the fate of this organization", "I find that my values and the organization's values are very similar" and "I boast about this organization to my friends as a great organization to work for." A complete list of the items in the scale can be found in Appendix G.

**Computer Confidence.** Trainees' computer confidence was measured using a 10-item subscale derived from a factor analysis of a computer attitudes instrument developed by Loyd and Gressard (1984). With only slight wording changes the 29-item Loyd and Gressard questionnaire was used (Appendix H).

The 10-item subscale from these data contained 4 of the items from Loyd and Gressard's original Computer Confidence subscale and 6 items from their Computer Anxiety subscale. This factor structure was similar to that found by Bandalos and Benson (1990) using the same instrument and factor analysis methods.
All items on the 10-item computer confidence subscale from these data had factor loadings above .40. The internal reliability estimate for the scale was .93.

Examples of the scale items were: “Computers do not scare me at all”, "I have a lot of self-confidence when it comes to working with computers", "Generally, I feel OK about trying to solve problems on a computer", "I'm no good with computers (reverse coded)", and "Computers make me feel uneasy and confused (reverse coded)". A complete list of the questions can be found in Appendix I.

Training Attitudes. Attitudes trainees have developed about safety and procedures training were measured using a 7-item subscale derived from a factor analysis of the START instrument (Weinstein, Palmer, Hanson, Dierking, McCann, Soper, & Nath, 1994). A copy of the START instrument can be found in Appendix J. The 7-item subscale derived from this study contained 5 items from the START instrument subscale titled "Attitudes" which also had 7 items. The other 2 items were also from the START instrument. Item 46 came from the Motivation to Learn subscale and item 53 came from the Knowledge Acquisition subscale (Weinstein et al., 1994).

All seven items for the Training Attitudes scale used in this study had factor loadings above .40. The reliability estimate for the scale was .82.

Examples of the items on the Training Attitude Scale were: "As long as I get good raises or promotions, I do not care whether or not I participate in training (reverse coded)", "It is more important to complete a training program
than to really understand the material being presented (reverse coded)”, “I believe training programs are important for professional development” and “I would rather not participate in training (reverse coded)”. A complete list of the items in the scale can be found in Appendix K.

**Learning Environment**: The measure of trainees' reaction to and perception of the physical learning environment was assessed using a 4-item subscale derived from a factor analysis of the computer related portion of the Reaction Instrument (Appendix A). This instrument was developed by the evaluation team members. Factor loadings for each of the 4 items were greater than .50. The reliability estimate (alpha = .73) was adequate.

Items included in this scale were: "The computer is in a well-lighted area in my unit", "The setting for the training made it difficult for me to learn (reverse coded)", "It is generally too noisy in my unit to be able to work on the computer (reverse coded)", and "There is not enough time during my shift to use the computer (reverse coded)". These questions will be used to try to capture the trainees' reaction to the physical conditions that may influence the training process. Items with factor loadings can be found in Appendix L.

**Content Validity**: The extent to which the trainees judge the content of the training to accurately reflect job requirements were measured using a 3-item subscale derived from the factor analysis of the Transfer Climate Instrument (Appendix M), which was developed by the evaluation team. All items on the scale had factor loadings above .40. The reliability estimates (alpha = .74) was within the acceptable range.
The three items included in this scale were: "The standard operating procedures taught in the training are correct", "Skills and knowledge taught in the training are the same skills and knowledge needed to do a good job", and "Equipment illustrated in the training does not operate the same way as the equipment in this unit (reverse coded)"). A list of the items with factor loadings can be found in Appendix N.

Learning. The learning measure was obtained from the scores each trainee received on tests taken at the end of each lesson. The computer automatically calculated a percentage of correct answers on each test that was taken when the trainee achieved the 80 percent criterion level to pass. The computer only recorded passing grades. The trainee was allowed to take the test as many times as needed to achieve a passing grade. Total test scores for each trainee in HCN and HPF, recorded before May 15, 1995, were averaged to obtain their learning score.

Supervisor Support. All the environmental factor variable measures came from the Transfer Climate Instrument (Appendix M), which was developed by the evaluation team. Trainees' perceptions of the extent to which supervisors reinforce and support the use of learning on the job were measured using a 23-items subscale derived from a factor analysis of the Transfer Climate Instrument (Appendix N). All items on the Supervisor Support scale had factor loadings greater than .40 with alpha=.86.

Examples of the types of questions included in this scale were: "My advisor meets regularly with me to work on problems I may be having in trying to
use my training", "My advisor meets with me to discuss ways to apply training on the job", "My advisor helps me set realistic goals for job performance based on my training", and "My advisor discusses performance expectations (based on training) with me shortly after the training is completed." A list of the items in the Supervisor Support scale can be found in Appendix O.

**Supervisor Sanctions.** The trainees' perceptions of negative responses of supervisors if training is used on the job were measured with a 6-item scale derived from a factor analysis of the Transfer Climate Instrument. This is a negative scale because on all items a low score is thought to be more favorable, and; therefore, should have a negative correlation with motivation to transfer. All items had factor loadings greater than .40. The scale consists of six items with alpha = .74.

Examples of the items included in this scale were: "My advisor opposes the use of the techniques learned in training that I bring to the unit", "My advisor doesn't seem to care whether I use my training or not", "My advisor pays only lip service to the value and usefulness of training", and "My advisor thinks I am being ineffective when I use the techniques taught in training". A complete list of the items and their factor loadings can be found in Appendix P.

**Peer Support.** The trainees' perceptions of their peers' reinforcement and support of the training on the job were measured using a 7-item subscale derived from the factor analysis of the Transfer Climate Instrument. All items had factor loadings greater than .40 with alpha = .83.
Examples of the items included in the scale were: "My colleagues have the technical knowledge to help me use the techniques learned in training", "My colleagues encourage me to use the skills I learned in training", "My colleagues in this unit expect me to perform my job in a manner that is consistent with my training", and "My colleagues appreciate my operating the unit as taught in training". A complete list of the items in the Peer Support scale can be found in Appendix Q.

**Opportunity to Use.** The trainees' perceptions of the extent to which trainees are provided the necessary resources and equipment that allows them to perform as taught in the training sessions were measured using a 5-item subscale derived from the Transfer Climate Instrument. All items in the scale had factor loadings greater than .45 with alpha = .86.

Examples of the items included in the scale were: "The materials and supplies are available to me to allow me to use the skills and knowledge learned in training", "Information describing the procedures taught in training is available to me after training if I need them to complete my work", "The financial resources are available that will allow me to use skills acquired in training", and "Training aids are available on the job to support what I learned in training". A complete list of the items and their factor loadings can be found in Appendix R.

**Data Collection**

**Subject Selection**

The evaluation team met with the design team project coordinator to determine the status of the implementation of the computer-based training.
Working with the project coordinator, the evaluation team determined that only two units, HCN and HPF, would be included in this study. HCN, HPF, and TPD (Textile Products Division) were the only units that had been exposed to the CBT, however, TPD would not agree to participate in the study. The training modules had been installed in these HCN and HPF for several months and the majority of the tests had been completed by the trainees.

**Administration of Instruments**

**Questionnaires.** After the training program had been in place for several months, members of the evaluation team went to each of the units during each shift and administered the questionnaires. The units run 24 hours per day with four shifts per unit.

The questionnaires were administered in two phases. In the first phase, trainees were asked to complete the Reaction Instrument and the Transfer Climate Instrument. An evaluation team member hand delivered the instruments with instructions. Trainees were asked to put their name, shift, and to indicate if they were a supervisor on each of the questionnaires. Trainees were assured of confidentiality and told that none of the information from the questionnaire would go into their individual employment files. Questionnaires were completed while the evaluation team member waited. Completed questionnaires were then collected by the evaluation team member and returned to Louisiana State University to be coded and entered into a database.

During the second phase of the questionnaire data collection, the Job Attitude, Computer Attitude, START, and Learning Survey instruments were
administered. The same procedure used in the first phase of the data collection
was used to administer this group of questionnaires.

Some trainees were absent or not available to complete the
questionnaires on the initial data collection visit. An evaluation team member
made return visits to administer the questionnaires to these trainees. The same
procedure was followed on each of the return visits.

**Learning Measure.** Along with each lesson, the trainees were required to
complete a test on the computer. The test include multiple choice, short
answer, and true/false questions, with three versions of the test questions for
each lesson. At the end of each lesson, the computer randomly selected one of
the three versions of each question to make up the test.

The trainee was allowed to take the test as many times as was needed to
achieve the 80 percent correct level. However, because of the random
selection of question type by the computer the tests were seldom exactly the
same, although the content of the test remained the same. If the trainee felt
confident in his/her knowledge of the SOPs or safety procedure contained in the
lesson, he/she could choose to take the test without going through the lesson.
This allowed more experienced and/or knowledgeable trainees to complete their
training requirements faster than those who needed more study time.

The learning measure data was collected from computer generated
reports showing the test completed and the scores for each test by employee.
An average of the test scores was calculated for each trainee and used as the
learning measure.
Demographic Data. The organization provided demographic data, such as hire date, birth date, and education levels on each of the employees in the study. These data were not used in the data analysis but are reported as descriptive information about the subjects.

Data Analysis

Tests of Hypotheses

Bivariate correlation analysis were used to test hypotheses 1 through 6 to determine the strength of the relationship of the individual independent variables and the dependent variable. Knowledge of the bivariate relationship between each of the independent variables and the dependent variable aided in the interpretation of the hierarchical regression results and gave a broader picture of the factors that contributed to motivation to transfer.

Hypotheses 7 through 11 was assessed using hierarchical multiple regression. The order of entry was as follows: (1) love of learning, internal work motivation, and organizational commitment (2) computer confidence and attitudes toward training (3) reaction to learning environment and reaction to content validity (4) learning (5) supervisor support, supervisor sanctions, peer support, and opportunity to use. The order of entry was based on the HRD Evaluation Research and Measurement Model (Holton, 1996) and the logical sequence of these variables or sets of variables as they appear in the training situation.

The individual or general attitude variables (love of learning, internal work motivation and organizational commitment) were entered first because
they are general attitudes and characteristics of the trainee which the trainees have before entering training. They are secondary influences and are outside the training design.

Situation specific attitudes (computer confidence and attitudes toward training) were entered second because they are more specific attitudes toward computer-based training. Computer confidence is a specific attitude because the training is computer-based training. Attitudes toward training are primarily based on experience with training within the organization; therefore, it is an attitude that is generalized from similar past training to the present training. These specific attitudes are thought to be part of or to influence motivation to learn.

The reaction variables (reaction to the learning environment and reaction to the content validity) were entered third because they are based on employee perceptions gained through the actual training sessions. They are based on the actual training content and training design.

Learning was an outcome of the actual training and was entered fourth. The variables entered prior to learning can influence learning primarily and motivation to transfer through the learning variable.

Finally, the environmental variables (supervisor support, supervisor sanctions, peer support and opportunity to use) were entered last. Trainees' perception of the transfer environment in which they will be using the knowledge and skills learned in training were proposed to have a direct effect on motivation to transfer over and above learning.
Hierarchical multiple regression allows for the ordering of variables or groups of variables. This method provides a partitioning of the variance, since increments in the proportion of variance in the dependent variable can be determined for each successive set over and above the influence of the preceding sets. Therefore, the unique portion of the total variance accounted for by each set of variables can be estimated by examining the $R^2$ series and tested for significance (Cohen & Cohen, 1983).

**Diagnostic Analysis**

The data was examined to determine if it were appropriate for regression analysis. Tests of the data for influential observations and the presence of multicollinearity were conducted, along with procedures to determine if the data met the assumptions of regression analysis.

**Influential Observations.** Influential observations are cases that have a disproportionate effect on regression results. They can be outliers, leverage points, or other observations that may serve to change the slope of the regression line resulting in distorted findings (Hair, Anderson, Tatham, & Black, 1995).

The SPSS statistical package provides several diagnostics for identifying influentials which include, studentized residuals, DFFITS, DFBETAS, centered leverage values, and Cook's Distance for identifying individual outliers, leverage points, and other influential observations. These methods were used to identify influential observations in the data.
**Multicollinearity.** Multicollinearity can distort interpretations of findings in regression analysis when the predictor variables are highly correlated with each other. Multicollinearity results in two problems. First, multicollinearity can limit the size of the coefficient of determination ($R^2$) making it more difficult to increase unique explanatory prediction from additional variables. Second, due to the fact that intercorrelated predictors have shared variance their effects are mixed or confounded, making it difficult to assess the unique contribution of the individual variables. In other words, when the degree of multicollinearity is high, there will be large portions of shared variance and lower levels of unique variance (Hair et al., 1995).

Multicollinearity was assessed using the diagnostics provided by the statistical package SPSS which gives a tolerance value and its inverse, the variance inflation factor (VIF). These measures give the degree to which each independent variable is explained by the other independent variables. Tolerance is the amount of variance of the selected independent variable not explained by the other independent variables, so, a very small tolerance value denotes high collinearity (Hair et al., 1995).

Another method of assessing multicollinearity provided by SPSS is a two step process of examining the condition index, which represents the collinearity of combinations of variables in the data set, and the regression coefficient variance-decomposition matrix, which shows the proportion of variance for each regression coefficient (and its associated variable) attributable to each
eigenvalue (condition index) (Hair et al., 1995). This method was also used to
determine if multicollinearity was a problem in this analysis.

**Linearity.** Linearity was assessed by examining residual plots or the combined effect of all predictor variables. Each independent variable was examined separately by looking at the partial regression plots, which show the relationship of a single predictor variable to the dependent variable (Hair et al., 1995).

**Constant Variance of the Error Term.** Plotting the residuals (studentized) against the predicted dependent values and comparing them to the null plot was the method used to determining the constance of the variance of the error term.

**Independence of the Error Term.** It is assumed in regression that each predicted value is independent, the value is not related to any other prediction such as sequencing or seasonal patterns. The independence of the error term can be identified by plotting the residuals against any possible sequencing variable. The pattern should appear random if the residuals are independent. Violations can be identified by a consistent pattern in the residuals (Hair et al., 1995). This data did not contain variables related to sequencing or seasonal patterns, therefore, data appropriate for testing time series was not collected. Because data appropriate for testing this assumption was not collected, no test for independence of the error term were conducted.

**Normality of the Error Term Distribution.** The normal probability plot was used to check for the normality of the error term distribution. This is a plot in which standardized residuals are compared with the normal distribution. If the
distribution is normal then the standardized residuals will follow the straight
diagonal line of the normal distribution. A visual check for a distribution
approximating the normal distribution was used to assess the normality of the
error term distribution.
CHAPTER 4: RESULTS

This study was conducted to determine the effect of individual or general attitudes, situation specific attitudes, reaction to the training environment and content validity of the training materials, learning, and environmental factors on trainees' motivation to transfer or use the training they received in a computer-based training program in the work setting. The independent variables examined in this study included: love of learning, internal work motivation, organizational commitment, training attitudes, computer confidence, perceptions of the physical environment, perceptions of the content validity of the training materials, learning, supervisor support, supervisor sanctions, peer support, and opportunity to use the training in the work setting. The dependent variable was motivation to transfer or use the training received in the training program. The analyses used to examine the relationships between the dependent variable and the independent variables were bivariate correlation analysis and hierarchical regression analysis.

This chapter will present a description of the general characteristics of the sample and report the results of the statistical analyses used to test the 11 hypotheses presented in Chapter 1. It will also present the findings of the diagnostic procedures used to examine the data.

Examination of the Data

Examination of the data consisted of determining the final sample size and describing the characteristics of the sample; diagnostic analysis to determine if there were influential cases that should be eliminated; checks for
multicollinearity; and checks to determine if the assumptions of regression had been met. Results of these procedures are reported in this section.

**Determining the Final Sample Size**

The number of participants completing the motivation to transfer measure (dependent variable) was 88. However, 14 cases were eliminated due to missing values. In regression analysis when listwise deletion is used, cases with any missing variables are dropped from the analysis. Therefore, missing data reduced the sample size to 74. Of the missing cases, 4 cases were relatively new hires that had not completed any of the tests for certification by the May 15, 1995 cut-off date; therefore, the learning measure was missing from these cases. Three of the cases did not complete any of the Transfer Instrument, and one person skipped a page from the Transfer Instrument. On the longer questionnaires, it was found that participants sometimes failed to complete the last page. Five cases were eliminated because they failed to complete the last page of either the Learning Instrument or the Start instrument. From the pattern of responses (i.e., all answers to the first page were 1's, second page 6's, etc.), it was clear that one person marked answers on several of the questionnaires without regard to the questions, resulting in those questionnaires being excluded from the analysis and, therefore, creating missing values for the variables taken from those questionnaires. Although the missing data is somewhat concentrated into a few areas, there does not appear to be a conscious systematic attempt on the part of the participants to avoid...
answering any particular questions. No cases were deleted due to influential cases (to be discussed later in this chapter).

Characteristics of the Sample

The participants in this study belonged to two production units, HCN (N=35) and HPF (N=39) of a petrochemical manufacturing facility. Both units perform similar duties and work similar schedules. Demographic data was available on age, tenure, education, and gender. Since the sample was 95% male, gender was not considered a major factor, but, the other demographic data were examined for differences between units. One-way analyses of variance were used to determine if there were any significant differences between the two units on age and years worked. Because education was a categorical variable, Chi-square analysis was used to determine if the units were significantly different on the education variable.

As can be seen in Table 1, no significant differences were found between units on age. The difference in average age between the two units was less than 3 years with the mean near 40 years of age for both units. While the difference in tenure of 3.9 years was statistically significant ($p < .05$), both units had a mean number of years worked greater than 10. In addition, at the time of the study only 2 participants had worked less than 3 years. Therefore, from a practical perspective, the difference was not expected to dramatically influence the results.
Table 1
One-Way Analysis of Variance Comparison of Means for Units HCN and HPF for Variables: Age and Tenure

<table>
<thead>
<tr>
<th>Variable</th>
<th>HCN Mean</th>
<th>HPF Mean</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SD</td>
<td>SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>42.69</td>
<td>39.90</td>
<td>2.232(_{1,72})</td>
<td>.140</td>
</tr>
<tr>
<td></td>
<td>7.22</td>
<td>8.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure(^b)</td>
<td>17.12</td>
<td>13.21</td>
<td>5.639(_{1,72})</td>
<td>.020</td>
</tr>
<tr>
<td></td>
<td>6.46</td>
<td>7.55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^b\) Job tenure is measured in years worked

The Chi-square statistic was not significant for the crosstabulation of unit and education. This indicated that the difference between the two units, on the variable education, was not significantly different from what would be expected based on the proportions of each group. Table 2 gives the expected and the actual proportions of the groups.

The sample (N=74) included 8 shift supervisors. Because these supervisors were required to participate in the training and take the certification examinations they were included in the sample. However, due to the questions pertaining to supervisors on the Transfer Instrument, there was the possibility that some bias might have been introduced even though the supervisors were instructed to answer the questions with regards to their own supervisors. To test for the possibility of bias, the supervisor variable was dummy coded and entered into the hierarchical regression analysis in step 5. It was not entered until step 5 because measures pertaining to supervisor support and supervisor sanctions were entered at this step. Results of the analysis indicated that the
Table 2
Chi-Square Comparison of Units HCN and HPF on Education

<table>
<thead>
<tr>
<th>Unit</th>
<th>Education</th>
<th>Count</th>
<th>Expected</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCN</td>
<td>1</td>
<td>17</td>
<td>15.6</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>11</td>
<td>14.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>7</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>35.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPF</td>
<td>1</td>
<td>16</td>
<td>17.4</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>20</td>
<td>16.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>39.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chi-Square Likelihood Ratio: Value=4.111m, Asymp. Sig. (2-tailed)=.128

* 1=High school graduate or equivalent; 2=Tech. school or <2 years college; 3=Associates degree or 2 years college; 4=College degree (BA or BS)

Regression coefficient for the supervisor dummy variable was non-significant (t=.093, p=.926). Since the dummy variable was not significant, the decision was made to include the supervisor cases in the analysis.

In summary, it was concluded that the usable sample of 74 was a reasonably homogeneous group with no practical differences in age, education, tenure, and gender that would skew the findings. In addition, it was deemed appropriate to include the supervisors in the sample.

Descriptive analyses were performed on the 74 cases. The results can be found in Table 3. Age and years worked were measured in number of years at the time of the study. Education was grouped into 4 categories that represent (1) high school or equivalent, (2) technical school or some college but less than a 2-year degree, (3) an associate degree or 2 years college, (4) a 4-year college degree. All the independent variables, except learning average, were measured on a 5-point Likert-type scale. Learning average had a possible range of 80 to 100 points, since the grades were not recorded until the trainee received a score of 80 on the tests. The means and standard deviations for all the
variables used in the study are shown in Table 3. Since the ranges for the variables using the Likert-type scale were restricted to 1 to 5, ranges for these variables will not be discussed further. The demographic variables and the learning average are discussed in more detail below:

1.) Trainees ranged from 22 to 62 years of age, the majority (39) of which were between the ages of 35 and 45, with 13 trainees younger than 35 years of age and 21 older than 45.

2.) All trainees had at least a high school or equivalent education, with 41.9% also having some college or technical training, and 13.5 having a 4-year college degree. No participants has associate degrees.

3.) Number of years worked ranged from 1.69 to 26.48, with 21 trainees having worked less than 10 years; 31 having worked between 10 and 20 years; and 21 having worked more than 20 years.

4.) The actual range for learning average was 90.48 to 99.92, with a mean of 94.21 and a standard deviation of 2.31.

Diagnostic Analyses

There are factors such as multicollinearity and influential observations that may affect the results of the analysis. Several diagnostic techniques were used to examine the data to determine if any conditions existed that would require making adjustments to the data. These diagnostics are described below.

Influentials. A test of the standardized residuals greater than 3 resulting from the regression analysis indicated that there were no cases with residuals
Table 3  
Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>α^d</th>
<th>N</th>
<th>Mean</th>
<th>Standard Dev.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Education^a</td>
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<td>Years Worked</td>
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<td>.62</td>
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<td>74</td>
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<td>Learning Average^c</td>
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<td>74</td>
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<td>.65</td>
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<td>Reaction - Content Validity^b</td>
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<td>74</td>
<td>3.27</td>
<td>.34</td>
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<td>Training Attitudes^b</td>
<td>.82</td>
<td>74</td>
<td>3.88</td>
<td>.73</td>
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<td>Supervisor Sanctions^b</td>
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<tr>
<td>Supervisor Support^b</td>
<td>.88</td>
<td>74</td>
<td>3.39</td>
<td>.50</td>
</tr>
</tbody>
</table>

^a 1=High school graduate or equivalent 2=Tech. school or <2 years college 3=Associates degree or 2 years college 4=College degree (BA or BS)
^b 1=Strongly disagree 2=disagree 3=Neither agree nor disagree 4=Agree 5=Strongly agree
^c The range of possible mean scores was 80 to 100.
^d Scale reliability estimates

Note. Age, Years Worked, and Education were not included in the regression analysis.

greater than plus or minus 3 standard deviations away from the predicted criterion variable. Additional diagnostics were conducted including Cook's Distance, DfBetas, and identification of leverage points as discussed by Hair et al. (1995).
Cook's Distance uses the impact of an observation from two sources: the size of the change in the predicted values when the case is omitted (outlying studentized residuals) as well as the observation's distance from other observations (leverage). The rule of thumb is to identify observations with a Cook's Distance of 1.0 or greater (Hair et al., 1995). No observations in this sample had a Cook's Distance of 1.0 or greater.

DFBETA is calculated as the change in the coefficient when the case is deleted. It is the relative effect of an observation on each coefficient. A lower threshold of 1.0 is recommended for small and medium-sized samples (Hair et al., 1995). An examination of the DFBETAs did not show a measure of 1.0 or larger for any of the coefficients in this sample.

The leverage point measure provides an assessment of the magnitude of each observation's impact on the predictions. The threshold limit recommended by Hair et al. (1995) is $2p/N$ when the sample size exceeds 50. Using this criteria, where $p$= number of predictor variables plus 1, the threshold for this sample equaled .3514. There were no leverage points greater than .3514. Since none of the diagnostics for influentials identified suspect cases, no cases were eliminated.

**Multicollinearity.** To determine if multicollinearity was a problem in the data, three methods were used (Hair et al., 1995). First, by looking at the correlation matrix it was found that the variables with the highest correlation ($r=.619$) were organizational commitment and internal work motivation.
Collinearity is not thought to be substantial until the correlation between variables reaches .90 or greater (Hair et al., 1995).

Second, the tolerance value, which is the amount of variability of the selected independent variable not explained by the other independent variables, was examined. Very small tolerance values denote high collinearity, with the common cutoff threshold of .10. The lowest tolerance value was .386 in this sample. An additional regression analysis was performed setting the tolerance level at the .01 significance level for eliminating variables from the analysis when significant multicollinearity is present. No variables were eliminated.

A final check of multicollinearity was done using the condition index and the regression coefficient variance-decomposition matrix. First variables with a condition index of 30 or greater were identified. Next, for all condition indices exceeding 30, variables with variance proportions above 50 percent were identified. Multicollinearity exists when the condition index identified in the first step accounts for a substantial proportion of variance (.90 or above) for two or more coefficients. Using these two criteria, multicollinearity was again found not to be a problem. Taken together these three methods of assessing multicollinearity indicate no multicollinearity problem in this sample.

Assumptions for Regression

Data should meet several assumptions before regression analysis can be used effectively. Hair et al. (1995) recommended that data should meet the following assumptions: linearity, constant variance of the error term, normality of the error term distribution, and independence of the error term.
**Linearity.** Linearity represents the extent to which the degree of change in the dependent variable associated with the predictor variable is constant across a range of values for the independent variable. Linearity was assessed by examination of the scatter plots of the studentized residual plots (See Appendix S). The partial regression plots were examined for the individual independent variables. The studentized residuals for all predictor variables were plotted against the predicted criterion values and examined for the combined effect of all predictor variables. No consistent non-linear pattern was found to suggest a violation of the linearity assumption.

**Constant variance of the error term.** The presence of unequal variance or heteroscedasticity was assessed by comparison of the null plot and the plot of studentized residuals against the predicted criterion values (see Appendix T). The presence of heteroscedasticity is indicated by a consistent pattern, usually triangle-shaped in either direction. The absence of any consistent pattern in this data suggested that the equal variance assumption had not been violated.

**Normality of the error term distribution.** A normal probability plot (see Appendix U), which compares the standardized residuals with the normal distribution, was used to determine the normality of the error term distribution. In this data the standardized residuals followed the normal distribution line with only minor departures, indicating that this assumption had not been violated.

**Independence of the error term.** The assumption in regression is that each predicted value is independent or that the predicted value is not related to any other predictions (Hair et al., 1995). This is usually a problem when
sequencing, such as time series experiments, or seasonal patterns could possibly affect the data. There was no time series data collected in this research, therefore, it was not possible to test for the independence of the error term over time. There was no logical reason to believe that this should have been a problem in this data.

Taken together, the analysis for the violation of the assumptions indicated that no serious deviations existed. Assurance that the assumptions had been met provided confidence in the accuracy of the predictions of the dependent variable and significance test of the coefficients in this study.

**Examination of the Hypotheses**

In this research 11 hypotheses were proposed. Hypotheses 1 through 6 were tested with Pearson’s Product Moment Correlations. Hypotheses 7 through 11 were tested using hierarchical regression. A one-tailed test was used to determine the significance level of the correlation since the direction of the relationships were specified in the hypotheses. This section will present the results of these statistical analyses.

**Bivariate Correlation Analysis**

Pearson’s Product correlation analysis was used to determine the bivariate correlations. The results of the correlation analysis can be found in Table 4 (complete correlation table can be found in Appendix V).

**Hypothesis 1:** Individual and general attitudes (love of learning, internal work motivation, and organizational commitment) will be positively correlated with motivation to transfer training to the job situation. As can be seen in Table
4. love of learning ($r=.327, p<.01$) and organizational commitment ($r=.410, p<.001$) were significantly correlated with motivation to transfer. However, internal work motivation was not significantly correlated with motivation to transfer. Hypothesis 1 was partially supported.

**Hypothesis 2**: Situation specific attitudes (training attitudes and computer confidence) will be positively correlated with motivation to transfer training to the job situation. Table 4 shows that both training attitudes ($r=.346, p<.001$) and computer confidence ($r=.391, p<.001$) were significantly correlated with motivation to transfer. Therefore, hypothesis 2 was fully supported.

**Hypothesis 3**: Reaction to training (perceptions of the physical learning environment and content validity of the training materials) will be positively correlated with motivation to transfer training to the job situation. Both reaction to the learning environment ($r=.247, p<.05$) and reaction to content validity ($r=.238, p<.05$) were significantly correlated with motivation to transfer. Therefore, full support was found for hypothesis 3.

**Hypothesis 4**: Learning will be positively correlated with motivation to transfer training to the job situation. Learning was not significantly correlated with motivation to transfer. Therefore, support was not found for hypothesis 4.

**Hypothesis 5**: Environmental factors (supervisor support, peer support, and opportunity to use) will be positively correlated with motivation to transfer training to the job situation. Supervisor support ($r=.397$), peer support ($r=.544$),
Table 4

Pearson Correlation Coefficients for Bivariate Relationships Between the Dependent Variable and the Independent Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Motivation to Transfer r (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer confidence</td>
<td>74</td>
<td>.391 (.001)</td>
</tr>
<tr>
<td>Internal work motivation</td>
<td>74</td>
<td>.179 (.063)</td>
</tr>
<tr>
<td>Organizational commitment</td>
<td>74</td>
<td>.410 (.001)</td>
</tr>
<tr>
<td>Love of learning</td>
<td>74</td>
<td>.327 (.002)</td>
</tr>
<tr>
<td>Training attitudes</td>
<td>74</td>
<td>.346 (.001)</td>
</tr>
<tr>
<td>Reaction - learning environment</td>
<td>74</td>
<td>.247 (.017)</td>
</tr>
<tr>
<td>Reaction - content validity</td>
<td>74</td>
<td>.238 (.020)</td>
</tr>
<tr>
<td>Learning average</td>
<td>74</td>
<td>.103 (.192)</td>
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<tr>
<td>Opportunity to perform</td>
<td>74</td>
<td>.580 (.001)</td>
</tr>
<tr>
<td>Peer support</td>
<td>74</td>
<td>.544 (.001)</td>
</tr>
<tr>
<td>Supervisor support</td>
<td>74</td>
<td>.397 (.001)</td>
</tr>
<tr>
<td>Supervisor sanctions</td>
<td>74</td>
<td>-.396 (.001)</td>
</tr>
</tbody>
</table>

Note. One-tail test used for significance and opportunity to use (r=.580) were all significantly related to motivation to transfer (p<.001). This hypothesis was fully supported.

Hypothesis 6: Environmental factor - supervisor sanction will be negatively correlated with motivation to transfer training to the job situation.

Supervisor sanctions was negatively correlated (r=-.396, p<.001) with motivation to transfer. Therefore, hypothesis 6 was supported.

In summary, of the group of hypotheses in which bivariate correlations were used to determine the strength of the individual independent variables' relationship with motivation to transfer, only the hypotheses involving internal...
work motivation and learning were not fully supported. Support was found for an association between motivation to transfer and love of learning, organizational commitment, training attitudes, computer confidence, reaction to the training environment and content validity of materials, and all the environmental factors (supervisor support, peer support, and opportunity to use).

**Hierarchical Regression Analysis**

Hierarchical regression analysis was used to determine the influence of independent variables or groups of independent variables on motivation to transfer entered in a priori sequence. Details of the analysis can be found in Table 5.

**Hypothesis 7:** Individual/general attitudes (love of learning, organizational commitment, and internal work motivation) will explain a significant proportion of the variance in motivation to transfer training to the job situation. In the first step of the regression analysis the predictor variables were love of learning, organizational commitment, and internal work motivation. This model was significant \( F=5.77_{(3, 70)}, p<.001 \), with an \( R^2 \) of .198. However, as can be seen in Table 5, only organizational commitment was a significant predictor of motivation to transfer \( (\beta=.412, p<.01) \). Hypothesis 7 was supported.

**Hypothesis 8:** Situation specific attitudes/motivation to learn (training attitudes and computer confidence) will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by individual/general attitude variables. In the second step of the hierarchical
regression model, training attitudes and computer confidence were added to the model. The expanded model was significant ($F=4.832_{(5, 88)}, p<.001$). However, as can be seen from Table 5, although the $R^2$ increased to .262, or by .064, the increase was not significant ($F=2.943_{(2, 88)}$). The beta coefficients for both training attitudes and computer confidence were non-significant. The beta coefficient for organizational commitment remained significant ($p<.01$) but decreased in magnitude by .046 ($\beta=.366$). Since there was not a significant increase in the amount of variance in motivation to transfer with the addition of the training attitudes and computer confidence variables, support was not found for hypothesis 8.

Hypothesis 9: Reaction to training (learning environment and content validity) will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by individual/general attitude variables and situational specific variables. In the third step of the hierarchical regression the reaction variables were added to the model. The model remained significant ($F=4.367_{(7, 88)}, p<.001$) with an $R^2$ of .317. Although the $R^2$ increased slightly, the addition of the reaction variables to the hierarchical regression model did not produce a significant change in the $R^2$ ($F=2.627_{(2, 88)}$) over the previous step. Reaction to the learning environment was a significant predictor of motivation to transfer ($\beta=.192, p<.05$). Reaction to the content validity was not a significant predictor in this model. Organizational commitment remained a significant predictor but decreased in influence further by .094.
Table 5

Results of Hierarchical Regression Analysis for Dependent Variable Motivation to Transfer

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta (p)</th>
<th>R^2</th>
<th>Adj. R^2</th>
<th>F/df(p)</th>
<th>Chg. R^2</th>
<th>F/df (p)</th>
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<tr>
<td></td>
<td>.198</td>
<td>.164</td>
<td>5.771</td>
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<td>(.001)</td>
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<tr>
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<td>.208</td>
<td>4.832</td>
<td>.064</td>
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<td>.260</td>
<td>4.204</td>
<td>.024</td>
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(Table continued)
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<tr>
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<th>Beta(p)</th>
<th>R²</th>
<th>Adj. R²</th>
<th>F/df(p)</th>
<th>Chg. R²</th>
<th>F/df(p)</th>
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<td>7.781</td>
<td>.264</td>
<td>10.184</td>
<td>4, 61 (.001)</td>
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<td>(.262)</td>
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<td>Love of Learnin</td>
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<td>(.726)</td>
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<tr>
<td>Internal Work Mot.</td>
<td>-.188</td>
<td>(.940)</td>
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<td>Training Attitudes</td>
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<td>(.329)</td>
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<tr>
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<td>(.002)</td>
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<td>Reaction-Lrn. Env.</td>
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<td>(.205)</td>
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<tr>
<td>Opportunity to Use</td>
<td>.379</td>
<td>(.001)</td>
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<tr>
<td>Peer Support</td>
<td>.315</td>
<td>(.001)</td>
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<td>Superv. Sanctions</td>
<td>-.179</td>
<td>(.040)</td>
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<td>(.848)</td>
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</tbody>
</table>

Note. One-tailed test used for significance of Beta Coefficients ($\beta=.272, p<.05$). Training attitudes, not a significant predictor in the previous step, was significant ($p<.05$) after the addition of the reaction variables. Since there was not a significant increase in the explained variance of motivation to transfer with the addition of the reaction variables, hypothesis 9 was not supported.

Hypothesis 10: Learning measures will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by individual/general attitude variables, situation specific variables, and reaction variables. The learning average was entered into the regression analysis in step 4. The regression model remained significant ($F=4.204, p<.001$) and the $R^2$ increased slightly to .341; however, the change in the $R^2$ was not
significant (F=2.406, p<.05). The learning average was not a significant predictor. However, reaction to the learning environment remained a significant predictor and its beta coefficient increased (β=.231, p<.05). In addition, reaction to the content validity became a significant predictor (β=.201, p<.05) when the learning average was added to the regression model. Organizational commitment and training attitudes, both significant predictors in the previous model, were not significant predictors in step 4. Since there was not a significant increase in the amount of variance explained with the addition of the learning variable to the model, support was not found for hypothesis 10.

**Hypothesis 11:** Environmental factors (peer support, supervisor support, supervisor sanctions, and opportunity to use) will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by individual/general attitudes variables, situational specific variables, reaction variables, and learning. In the final step of the hierarchical regression model, the environmental factors (peer support, supervisor support, supervisor sanctions, and opportunity to use) were added to the regression model. The 12-variable model was significant (F=7.781, p<.001) with an R² of .605. This represented an increase in the R² of .264 which was significant (F=10.184, p<.001). Of the 4 variables added in step 5, opportunity to use (β=379, p<.001), peer support (β=.315, p<.01) and supervisor sanctions (β = -.179, p<.05) were significant predictors of motivation to transfer. Supervisor support was not a significant predictor. Computer confidence, which was added in step 2, but had
not been a significant predictor up to this point, became a significant predictor
($\beta=.358, p<.01$). Since there was a significant increase in the amount of
variance explained when the additional variables were added in step 5,
hypothesis 11 was supported.

The final model with all the independent variables added explained
60.5% of the total variance in motivation to transfer with 4 significant predictors
of motivation to transfer. The significant predictors were: computer confidence,
opportunity to use, peer support, and supervisor sanctions. Looking at the
standardized betas in Table 5, it can be seen that opportunity to use has the
most relative influence ($\beta=.379$) with computer confidence ($\beta=.358$) and peer
support ($\beta=.315$) having only slightly less influence. Supervisor sanctions had
the weakest relative influence ($\beta=.179$).

In summary, of the hypotheses based on the hierarchical regression, only
hypothesis 7 and hypothesis 11 were supported. Hypothesis 7 was related to
the individual and general attitudes and made a significant contribution to the
explanation of motivation to transfer. Hypothesis 11 was related to the
environmental factors and made a significant contribution to the explanation of
the variance in motivation to transfer after accounting for the influence of the
previously entered variables.
CHAPTER 5: SUMMARY, CONCLUSIONS, AND DISCUSSION

This chapter restates the research problem and gives a brief overview of the study. Findings are then discussed and possible conclusions presented. Lastly, directions for future research are discussed.

Summary

Problem Statement and Objectives

The goal of this research was to provide a better understanding of factors that affect the trainee's motivation to transfer training to the job situation. Specifically, this study empirically and systematically examined a computer-based training program in a field setting to determine if the following factors influenced the trainee's motivation to transfer their training: individual and general attitudes (love of learning, internal work motivation and organizational commitment); situation specific attitudes (training attitudes and computer confidence); reaction (perceptions of the physical learning environment and perceptions of content validity of training materials); learning; and environmental factors (peer support, supervisor support, supervisor sanctions, and opportunity to use).

Procedures/Methodology

This research was designed as part of a larger project to evaluate a computer-based training program at a large petro-chemical plant in Louisiana. Participants in this study were trainees from 2 units within the plant who had undergone OSHA mandated safety and standard operating procedures using a newly installed CBT program.
The trainees completed six questionnaires, administered by members of a research team. Twelve of the 13 variables used in this study were derived from scales created from factor analysis of these 6 instruments. The learning measure was a calculated average of test scores for each trainee completed before May 15, 1995.

The final sample size for the study, after adjusting for missing data, was 74. Bivariate correlation analysis was used to determine the strength of the relationship between individual independent variables and the dependent variable, motivation to transfer. Hierarchical regression analysis was used to partition the variance explained in motivation to transfer by individual and groups of variables entered into the analysis in an a priori sequence based on a conceptual model. Hierarchical regression is an acceptable exploratory method of examining implicitly specified sequence of mediated causal relationships (James & Brett, 1984) and aids in the understanding of the viability of the sequence of variable entry into the regression analysis. Ordinary least squares regression procedures applied to the implicit sequences of mediated causal relations in the conceptual model can suggest regression coefficients of causally "early" variables that significantly predict the outcome variable (Holton & Russell, 1996). If the addition of specified causally "later" variables to the regression model results in coefficients for the causally "early" variables becoming nonsignificant, a mediated relationship between the "early", "later", and outcome variables is suggested (James & Brett, 1984).
Findings

Bivariate correlation analysis was used to examine the relationship of the dependent variable, motivation to transfer, with each of the independent variables (see Table 4). This analysis indicated:

1. Of the individual and general attitudes, love of learning and organizational commitment were significantly correlated with motivation to transfer. However, internal work motivation was not significantly correlated with motivation to transfer.

2. Both of the situation specific attitudes (training attitudes and computer confidence) were significantly correlated with motivation to transfer.

3. Of the reaction variables, both reaction to the physical environment and content validity of the training materials were significantly correlated with motivation to transfer.

4. Learning was not significantly correlated with motivation to transfer.

5. Environmental factors (supervisor support, peer support, and opportunity to use), that were predicted to have a positive correlation with motivation, had a significant positive correlation with motivation to transfer.

6. The environmental factor supervisor sanctions had a significant negative correlation with motivation, as was predicted.

Hierarchical regression analysis was used to determine how the variance in motivation to transfer was partitioned among the predictor variables (see Table 5). This analysis indicated:
1. The individual and general attitudes (love of learning, organizational commitment, and internal work motivation) explained a significant portion of the variance in motivation to transfer \( (R^2=.198) \). However, organizational commitment was the only individual significant predictor.

2. The addition of the situation specific attitudes (training attitudes and computer confidence) to the model did not significantly increase the explained variance of motivation to transfer after accounting for individual and general attitudes. Organizational commitment remained a significant predictor of motivation to transfer.

3. The addition of the reaction measures (reaction to learning environment and content validity of the training materials) to the model did not significantly increase the proportion of explained variance after accounting for the previously included variables. Reaction to the learning environment was a significant predictor of motivation to transfer, but reaction to content validity was not. Organizational commitment remained a significant predictor variable. Training attitudes, not a significant predictor variable when added to the model in step 2, became a significant predictor variable in step 3 with the addition of the reaction variables.

4. The addition of the learning measure did not significantly increase the amount of explained variance after accounting for the variance explained by the variables in the previous model. The learning measure was not a significant predictor of motivation to transfer. However, with the addition of the learning measure to the model, reaction to the content validity became a significant
predictor of motivation to transfer and reaction to the learning environment remained a significant predictor variable. Organizational commitment, which had been significant in the first three models, was not a significant predictor variable in the fourth model.

5. The addition of the environmental factors (peer support, supervisor support, supervisor sanctions, and opportunity to use) to the final model produced a significant increase in the explained variance of motivation to transfer after accounting for variance explained by variables entered in previous models. The final model accounted for 60.5% of the variance in motivation to transfer. Peer support and opportunity to use were significant positive predictors of motivation to transfer. Supervisor sanctions was a significant negative predictor of motivation to transfer. Supervisor support was a non-significant predictor. The reaction variables, which had been significant predictor variables in the fourth model, were not significant predictors in the final model. Computer confidence which was added in the second model, but had not been a significant predictor variable previously, became a significant predictor in the final model.

Conclusions and Discussion

Several findings from this study contribute to a better understanding of motivation to transfer what is learned in training to the actual work setting. The following section discusses these findings and gives possible conclusions that can be drawn from this research. The section is organized according to the conceptual model proposed for this study.
General and Individual Attitudes

The general and individual attitudes of love of learning, organizational commitment, and internal work motivation are secondary elements in the conceptual model (see Figure 2). These are attitudes the trainee brings to the training with them. They are thought to be outside the training process but may influence the training outcomes. The findings related to each of these variables will be discussed below. Model 1 was significant (p<.001) and explained almost 20% of the variance in motivation to transfer (R²=.198).

Love of Learning. Love of learning was significantly correlated with motivation to transfer (r=.327). Cohen (1977) considered the effect size in correlation analysis to be as follows: r=.10 to be small; r=.30 to be medium; and r=.50 to be large. Therefore, love of learning had a medium correlation with motivation to transfer. This finding supports the hypothesis that love of learning individually does have a positive relationship with motivation to transfer. Love of learning, however, was not a significant predictor of motivation to transfer when entered into the regression analysis with organizational commitment and internal work motivation. A possible explanation for the lack of significance in the regression analysis is the large correlation between love of learning and organizational commitment (r=.602). Although love of learning was moderately correlated with motivation to transfer, organizational commitment was more strongly correlated (r=.410). In the regression analysis the variance explained by love of learning may have been variance shared with organizational commitment. Therefore, after the variance explained by organizational
commitment was accounted for, the portion of unique variance explained by love of learning was not large enough to be a significant predictor.

**Internal Work Motivation.** Internal work motivation was not significantly correlated with motivation to transfer and was not a significant predictor variable when entered into the regression model with organizational commitment and love of learning. Although not a significant predictor in the first step of the regression analysis, internal work motivation had a negative beta coefficient, the opposite of the predicted direction. In the second model of the regression analysis, with the addition of training attitudes and computer confidence, internal work motivation had a beta coefficient of -.262 ($p=.039$ using a one-tail test for significance). However, since the coefficient was negative it was not in the predicted end of the distribution curve and therefore $p=.961$ and thus the beta coefficient is not significant.

This finding was puzzling. Based on prior research in the area of internal work motivation and job performance (Hackman & Lawler, 1971; Oldham, 1976), in which those high in internal work motivation were found to have higher job performance ratings, it seemed logical to hypothesize that those people high in internal work motivation would be more likely to be motivated to transfer training back to their job because training is an effort to improve job performance. Although this reasoning may be valid in general, one possible explanation for the negative finding in this specific situation may be the culture of this industrial setting and the participant's response to OSHA mandated
training. Federally mandated training had been viewed in the past as a requirement to be fulfilled rather than a means to improve performance. Therefore, those trainees who had high internal work motivation may have resented having to take the time away from their jobs to complete training. Additionally, they may have felt they were already doing a good job, thus they did not need the training. Hicks and Klimoski (1987) found that trainees who received a realistic preview of the training program in their study and were given a high degree of choice in what training to take were more likely to perceive the training as appropriate for them and were better able to profit from the training. Noe and Schmitt (1986) reported that trainees in their study were more likely to be satisfied with the training program content if they had been in agreement with the needs assessment than those trainees who had disagreed with the assessment of their skill needs.

The implications of the finding may be that trainees should be informed of the importance and purpose of the training before the training program begins. It is important to frame the training in a manner that conveys the benefits to the trainee and the company. Martocchio (1992) found that when microcomputer training was presented to trainees using positive labeling which framed the training as an opportunity, training outcomes were more positive than in a group where the training was framed in more neutral terms. Additionally, it may be important to stress that the training is not an indication of poor performance.

With the addition of the reaction variables in model 3, the significance level of internal work motivation decreased ($p=0.069$ using the one-tail test for...
significance). The coefficient retained the negative sign and remained non-significant throughout the remainder of the hierarchical regression analysis.

Organizational Commitment. Organizational commitment was positively and significantly correlated with motivation to transfer ($r=.410$). In the initial step of the hierarchical regression, organizational commitment was a significant predictor variable ($\beta=.412$). Organizational commitment remained a significant predictor with the addition of training attitudes and computer confidence in the second step of the regression analysis and with the addition of the reaction variables in the third model. However, the magnitude of the beta coefficient decreased with the addition of each subsequent group of variables. Organizational commitment was not a significant predictor variable after the addition of the learning variable in the fourth model, and also was not a significant predictor in the final model.

The findings clearly indicate organizational commitment had an influence on motivation to transfer. With the addition of the situation specific variables (training attitudes and computer confidence) the magnitude of its direct influence decreased ($\beta=.366$) and further decreased with the addition of the reaction variables ($\beta=.272$). It became a border-line non-significant ($p=.051$) predictor ($\beta=.247$) with the addition of the learning variable and was fully mediated with the addition of the environmental variables.

Since organizational commitment clearly became a non-significant predictor ($p=.262$) in the final model, this suggests that the influence of the
environmental variables took precedence over organizational commitment. In other words, high organizational commitment is important to increasing motivation to transfer, but its influence could possibly be offset by perceptions of the transfer environment. This notion supports the proposition by Tannenbaum and Yukl (1992) that even though the trainees may leave training with a strong intent to use skills and knowledge learned in training, the actual transfer may be limited by the posttraining environment to which the trainee returns.

From a practical point of view, these findings support a systems approach to motivating trainees to transfer what they have learned. A trainee who is committed to the organization may have a certain amount of motivation to use his/her training but this motivation may not be strong enough to overcome unfavorable perceptions of the transfer environment.

**Situation Specific Variables**

In the conceptual model, situation specific variables (training attitudes and computer confidence) are included as motivational elements. These variables are thought to have an indirect influence on motivation to transfer through learning and reaction.

**Training Attitudes.** Training attitudes was moderately and significantly correlated with motivation to transfer ($r=0.346$). In the hierarchical regression training attitudes was not a significant predictor of motivation to transfer when it was initially entered into the regression analysis in step 2, but became a significant predictor variable in step 3, with the addition of the reaction variables to the regression model. In Model 2, training attitudes was strongly correlated
with the previously entered variables, love of learning ($r=0.601$), organizational commitment ($r=0.436$), and internal work motivation ($r=0.516$). In addition, it was strongly correlated with computer confidence ($r=0.512$), which was entered along with training attitudes. Being strongly correlated with the other variables in the model may have left little unique variance, related to this group of variables, to be explained by training attitudes in Model 2. However, with the addition of the reaction variables, the combination of variables in Model 3 allowed the unique variance explained by training attitudes to increase to significance. With the addition of the learning variable in step 4, training attitudes again became a non-significant predictor variable. This suggests that the influence of training attitudes seen in Model 3, was fully mediated by the learning variable.

The correlation between training attitudes and motivation to transfer, along with the significant beta coefficient in Model 3, suggests that there may have been a causal relationship between these two variables. Therefore, the influence of training attitudes on motivation to transfer cannot be ignored. Prior studies have shown that training attitudes can be predictive of success in training situations (Hicks & Klimoski, 1987) and increase transfer of learning (Karl & Ungsritong, 1992).

The implications of this and other research concerning training attitudes indicate that care should be taken to ensure that trainees develop good attitudes regarding training. Gill (1989) proposed that employees often take their cues about the importance of training from management; therefore, it is
important that management show by their actions that training is important and beneficial to the organization. Management's support for training may be especially crucial in industrial settings where OSHA has mandated training because this type of training may be viewed by trainees as a means of fulfilling requirements rather than a means of performance improvement.

**Computer Confidence.** Computer confidence was moderately and significantly correlated with motivation to transfer ($r=.391$). It was entered along with training attitudes in step 2 of the hierarchical regression. It was not a significant predictor variable in Model 2, or Model 3 when the reaction variables were added, or Model 4 when the learning variable was added. However, it became a significant predictor ($\beta=.358$) in the final model when the environmental variables were added to the regression analysis.

Although the results of the correlation analysis and the hierarchical analysis suggest that computer confidence is an important predictor of motivation to transfer in this study, computer confidence did not follow the expected pattern in the regression analysis. If it had followed the expected pattern it would have been a significant predictor in step 2, but would have become a non-significant predictor after the addition of the reaction variables and the learning variable, because its effect on motivation to transfer was thought to be indirect through learning.

One possible explanation for its lack of significance in step 2 is that it is strongly correlated with each of the other variables in the model: organizational
commitment ($r=.512$), love of learning ($r=.613$), internal work motivation ($r=.477$), and training attitudes ($r=.512$). This may leave little unique variance in motivation to transfer explained by this group of variables to be attributable to computer confidence.

Observing the progression of the steps in the hierarchical regression (Table 5), it can be seen that although computer confidence is not a significant predictor in Models 2, 3, or 4, the beta coefficient decreases slightly in each successive step ($\beta=.219$, $.195$, and $.191$ respectively). However, with the addition of the environmental variables in step 5, the beta coefficient became significant ($\beta=.358$).

This finding indicates that computer confidence may have a direct effect on motivation to transfer rather than an indirect effect through learning as was proposed in the conceptual model. One possible explanation for this can be found in writings of Bandura (1977) on self-efficacy. Although computer confidence is not a direct measure of self-efficacy, as was discussed in the literature review, it does contain some elements of self-efficacy, because self-efficacy refers to one's belief in one's capability to perform a specific task (Gist, 1987). Bandura proposed that perceptions of self-efficacy are gained from several sources, including vicarious experience (watching others model the desired behavior) and verbal persuasion (being led by others into believing they can perform a task successfully). Computer confidence may be strengthened
with the addition of the peer support variable through the modeling component of self-efficacy and/or the supervisor support variable via verbal persuasion.

An alternative explanation for the direct effect of computer confidence on motivation to transfer may be found in the nature of the trainees' work rather than the learning process. Computers are used in their day-to-day jobs of carrying out the standard operating procedures, which were taught in the training program. Therefore, computer confidence may be related to trainees' belief that they can successfully perform the operating procedures using the computer, rather than their confidence in using the computer to learn the training materials.

Clearly further research is needed to determine the exact nature of the relationship between computer confidence and motivation to transfer in CBT. However, if the effect of computer confidence on motivation to transfer is the result of using a computer to deliver the training materials, the implication would be that providing opportunities for trainees to become confident in their use of computers before training begins would be beneficial. If, on the other hand, computer confidence is related to their confidence in their ability to use the computer to perform the standard operating procedures learned during training, care should be taken to design the training to ensure that trainees have an opportunity to practice their skills to gain confidence and that constraints to their using the skills taught in training are minimized. Peters et al. (1984) proposed that relevant individual differences in ability and motivation interact with situational constraints to predict performance. Therefore, if trainees feel
constrained by their ability to use the computer to perform their jobs as taught, they may be less motivated to attempt to use what they learned in training.

**Reaction Variables**

The reaction variables included reaction to the learning environment or perception of the physical learning conditions, and reaction to the content validity of the training materials. These variables are depicted as environmental elements of the conceptual model and are thought to influence motivation to transfer through learning.

**Reaction to the Learning Environment.** Reaction to the learning environment was significantly correlated with motivation to transfer \((r=.247)\) and was also a significant predictor when added to the regression model in the third step of the hierarchical regression \((\beta=.192, p<.05)\). The CBT presented the trainees with a different learning environment from the one they had previously experienced in a more traditional setting. The positive significant correlation between reaction to the learning environment in this CBT setting and the significant beta coefficient resulting from the regression analysis suggest that higher levels of positive reactions to the learning environment played a role in increasing motivation to transfer in Model 3 before the addition of the environmental variables. After the addition of the environmental variables reaction to the learning environment was no longer a significant predictor. This finding marginally supports the idea that care should be taken to make the learning environment as conducive to learning as possible (Finkel, 1990). However, care should be taken in interpreting this finding, because the influence
of the group of environmental variables appear to take precedence over the reaction variable.

With the addition of the reaction variables to the regression analysis in Model 3, training attitudes became a significant predictor (p=0.05). The increase in significance of training attitudes may suggest that reaction to the learning environment had a moderating influence on the impact of training attitudes on motivation to transfer. Reaction to training is believed to be a mediator in some training relationships and a moderator in others (Mathieu et al., 1992). Reaction has been viewed as having a moderating role between motivation to learn and learning (Holton, 1996; Mathieu et al., 1992). In the conceptual model for this study training attitudes was considered a motivating element that influenced motivation to transfer indirectly through the learning variable. Since CBT was a new method of training delivery, trainees may have been skeptical about the likelihood of their learning from the training module in the work area. However, their attitudes about the training may have been improved by a positive reaction to the learning environment.

**Reaction to Content Validity.** Reaction to content validity and motivation to transfer were significantly, though modestly, correlated (r=0.238). Reaction to content validity was not a significant predictor of motivation to transfer when initially entered into the regression model in step 3. However, with the addition of the learning variable in step 4 of the regression analysis, reaction to content validity did become a significant predictor variable (β=0.201). It became a non-
significant predictor in the final model with the addition of the environmental variables.

Reaction to the content validity was perceived in the conceptual model to affect motivation to transfer indirectly through its influence on learning. This path was not suggested from these data since the beta coefficient for reaction to content validity became significant, rather than non-significant as expected, with the addition of the learning variable. This may suggest that, in the fourth model, reaction to content validity has a direct influence on motivation to transfer that was moderated by the learning variable rather than mediated by the learning variable. If the relationship between learning and reaction to the content validity was a moderated relationship, then it would be possible for the learning variable to strengthen or lessen the effect of the reaction variable on motivation to transfer. Motivation, prior to training, has been found to be influenced by the trainees' perception of the relevance of the training on either future job performance or career advancement (Clark et al., 1993). It can be reasoned that if pre-training motivation can be influenced by perceived content validity, then motivation to use the training may be strengthened as the trainee is exposed to the materials during the learning process and has the opportunity to actually judge the training to have content validity.

Another possible explanation for the lack of any indication of the learning variable mediating the influence of the reaction variables on motivation to transfer is that the learning variable may not be a valid measure of the learning that took place in this study. This issue will be discussed further in the next
These findings indicate a relationship between the trainees' reaction or perception of the content Validity of the training material and motivation to transfer. Further research, perhaps with a stronger measure of learning, is needed to clarify the role that learning plays in the relationship between reaction to content validity and motivation to transfer learning. From a practitioner standpoint, these findings indicate the need for conducting needs assessments prior to the development of the training contents. Needs assessments conducted prior to the design of training programs provide a basis for establishing content validity through identification of the specific skills, knowledge, and abilities needed to perform the task or procedures included in the training program (Campbell, 1988).

**Learning**

The fourth element of the conceptual model is learning or a measure of the learning that took place during the training program. Learning is believed to mediate other relationships in the model and to have a direct influence on motivation to transfer.

**Learning Average.** The learning average variable was not significantly correlated with motivation to transfer. In addition, it was not a significant predictor of motivation to transfer in Model 4 or the final model, Model 5. Examination of the complete correlation table (Appendix S) revealed that of the 12 other variables in the study, learning was significantly correlated with only
one other variable, reaction to the content validity \((r=-.208)\). This correlation was not in the expected direction and was between a small and medium magnitude (Cohen, 1977).

As can be seen in the conceptual model (Figure 2) and from the literature review, learning was expected to be influenced by: computer confidence (Bracey, 1988; Harrington et al., 1988; Oliver & Shapiro, 1993); training attitudes (Porter et al., 1975; Ryman & Biersner, 1975); and reaction to training (Clements, 1982; Mathieu, 1992). The lack of significant correlations between the learning measure and these variables, taken together with the lack of significant findings in the regression analysis involving learning measure, suggests there may be some measurement error included in the learning average.

In addition, as discussed in the limitations section of Chapter 1, the researchers were not involved in the construction of the test used at the end of each lesson to assess learning, and later averaged to calculate a learning average score used in these analysis. Although the learning measures were based on tests created by subject matter experts (i.e., operators within the plant who were actually involved in performing the procedures) there was no assurance that tests were comprehensive or representative measures of the learning that took place resulting from the CBT.

Another factor affecting the learning measure was a range restriction due to grades not being recorded until a passing score of 80% was achieved. Trainees were allowed to take the test as many times as needed to satisfy the
80% correct criterion for the mandated certification. As can be seen in Table 3, the learning average was 94.21 with a standard deviation of 2.31. Therefore, there was little variability in the learning score.

In summary, the lack of correlations with the other variables in the analysis, lack of assurance of the comprehensiveness and representativeness of the test, and the range restrictions suggest that there may be measurement error in the learning measure. When measurement error is involved the predictive power of the independent variable is reduced as the measurement error increases (Hair et al., 1995). Therefore, further research is needed to examine the influence of learning on motivation to transfer, as well as, the role of learning as a mediating and/or moderating variable for "earlier" entered variables in the sequence of entry in the hierarchical analysis.

**Environmental Factors**

The environmental factors include the variables: opportunity to use, peer support, supervisor sanctions, and supervisor support. The addition of this group of variables in the fifth and final step of the hierarchical regression increased the $R^2$ significantly, explaining an additional 26.4% of the variance in motivation to transfer over the previous model ($R^2=.605$, adjusted $R^2=.527$). This is consistent with research that relates environmental influences to transferring training that results in performance (Baumgartel et al., 1972; Rouiller & Goldstein, 1993; Tracy et al., 1995; Xiao, 1996).

With the addition of the environmental variables, the reaction variables, which were significant in the previous model, become non-significant predictors.
of motivation to transfer. This finding suggests that the environmental variables may fully mediate the relationship between the reaction variables and motivation to transfer. If trainees' reactions to the training are mediated by the environmental variables, it would suggest that increases or decreases in motivation to transfer influenced by the trainees' reaction to the training may be superseded by the trainees' perception of the environment to which he/she would be returning to implement the learning gained during training.

**Opportunity to use.** Opportunity to use was significantly correlated with motivation to transfer ($r=.580$). Results of the regression analysis indicated opportunity to use to be a significant predictor of motivation to transfer ($\beta=.379$). From the beta coefficients, it can be seen that opportunity to use is the strongest predictor of motivation to transfer in the final regression model.

These findings are in agreement with earlier research and theory (Peters & O'Connor, 1980; Peters et al., 1985; O'Connor et al., 1984) that constraints to using what was learned in training affects the use of what was learned in training. Although earlier research and theory has dealt with the effects of constraint on performance, it can be reasoned that if constraints affect performance, perceptions of environmental constraints may influence motivation to perform.

For the practitioner, these results indicate that care should be taken to ensure that trainees anticipate returning to an environment that will provide the necessary job-related information; tools and equipment; materials and supplies;
budgetary support; required services and help from others; and time availability
needed to perform relevant tasks as learned in the training program.

Peer Support, Supervisor Support, and Supervisor Sanctions. Peer
support, supervisor support and supervisor sanction are components of transfer
climate. Several research studies have been conducted that support the
influence of transfer climate on performance (Rouiller & Goldstein, 1993; Tracy
et al., 1995). From these studies it can be reasoned that if transfer climate
influences performance, then perceptions of the transfer climate may influence
motivation to transfer.

Peer support was positively and significantly correlated with motivation to
transfer ($r=.544$), indicating a strong relationship with motivation to transfer.
The hierarchical regression also showed peer support to be a significant
predictor of motivation to transfer ($\beta=.315$) when entered into the regression
equation with the other environmental variables. Supervisor support was also
positively and significantly correlated with motivation to transfer ($r=.397$).
However, supervisor support was not a significant predictor of motivation to
transfer in the regression analysis. Supervisor sanctions, that is, supervisor's
negative reactions to the trainees' efforts to use skills and knowledge learned in
training, was negatively and significantly correlated with motivation to transfer
($r=-.396$). Supervisor sanctions was also a significant predictor of motivation to
transfer in the regression analysis. As was expected, the sign of the beta
coefficient was negative for supervisor sanctions since the scale was a negative scale, indicating that higher supervisor sanctions lowers motivation to transfer.

These findings indicate that, in this setting, peer support was a stronger influence than supervisor support, which was not a significant predictor of motivation to transfer, on trainees motivation to use what they learned in training. More research has been done addressing the issue of supervisor support than peer support (Brinkerhoff & Mostesino, 1995; Fleshman, 1953; Huczynski & Lewis, 1980). These studies that have emphasized supervisor support have generally confirmed the proposition that supervisor support had an influence on transfer behavior. Clark et al. (1993) found supervisor training transfer climate affected perceived job utility, which in turn, affected training motivation. However, Clark et al. did not find support for group training transfer climate (peer support) to have an effect on perceived training utility. They believed that the interaction between members of the group was less in their sample than in some other work environments, which could account for the lack of effect for the group climate variable. Facteau et al. (1995) found peer support was positively related to perceived training transfer, but supervisor support was negatively related. These mixed results involving peer and supervisor support may be a function of the setting or interaction and cohesiveness of the groups under study. Therefore, in a group setting, such as the one in this study, where the peer groups have a great deal of interaction and often become close friends, the influence of peer groups may be stronger than in a work setting where the work is done more independently. In light of the
recent trend towards the use of teams in organizations, this finding may have important implications for motivating team members to use training once back on the job.

In addition, differences in findings may have resulted from the way the variables in different studies were measured. The need for a reliable instrument to measure transfer climate still exists. The instrument in this study was an effort to build upon and validate the instrument developed by Rouiller and Goldstein (1993) through the use of factor analysis (Bates, Holton, & Seyler, 1996b). Further research is needed using better measurement instruments and techniques to determine the components of transfer climate and the effect of each component on the transfer process.

Little research has been done that separates the effects of supervisor support and supervisor sanctions. Supervisor sanctions have been considered the low end of a supervisor support continuum. Fleshman (1953) found support for the proposition that supervisors can hinder trainees from using the training learned. Rouiller and Goldstein (1993) made an attempt to examine separately the negative and positive influences on training transfer by factors in the transfer climate but were unable to make such fine distinctions. However, Rouiller and Goldstein’s (1993) study gave some suggestion that negative consequences can play a role in the transfer process. Supervisor sanctions may be what Herzberg (1968) termed a "hygiene" factor. The presence of supervisor sanctions may serve to lessen motivation, as is suggested by these findings; however, the absence of supervisor sanctions are not thought to
increase motivation. The significant findings related to supervisor sanctions indicate the need to eliminate supervisory opposition to the training before the training begins so that supervisors' attitudes and actions do not discourage trainee's use of the training.

All of the transfer climate variables were significantly correlated with motivation to transfer. In addition, peer support and supervisor sanctions were significant predictors of motivation to transfer. Taken together, the implications for these findings are that both supervisors and peers need to be convinced of the importance of the training. One method of gaining support for training is by involving participants in the planning and decision making process of the training program. Clark et al. (1993) found when trainees in their study had been involved in training decisions they perceived the training to have higher levels of job utility or usefulness, which, in turn, lead to higher levels of training motivation.

One method of involving trainees and supervisors is through needs assessment. By involving them in a needs assessment a sense of control over what is being presented in the training program may be gained. Adult learning theorists believe a sense of being in control is important to adult learners (Knowles, 1984). Mathieu and Martineau (1997) proposed that a needs assessment sends the message that the training is focused and therefore more beneficial to the trainees and the organization. Argyris (1989) recommended strategic planning meetings with supervisors and their direct reports to determine problems and steps to overcome problems in learning programs.
In summary, in the final analysis, perceptions of the environmental elements as a group presented the strongest influence on motivation to transfer included in the regression analysis. Environmental variables appear to have a direct influence, and may mediate and/or moderate the influence of other variables, on motivation to transfer. The implications of these findings support the need to develop a respect and support for the training process among peers and supervisors in order to provide a supportive transfer climate that encourages the transfer of training. In addition, the support found for opportunity to use being a significant predictor indicates that care should be taken to ensure that trainees are provided with the necessary resources, information, and time to perform task as learned in training.

General Conclusions

Four key findings emerged from this study. Perhaps the most important finding was the large amount of variance in motivation to transfer that was explained by perceptions of environmental factors (opportunity to use, peer support, supervisor sanctions, and supervisor support). With the addition of this group of variables in the fifth and final step of the hierarchical regression the amount of explained variance was significantly increased by 26.4% over the previous model ($R^2=.605$, adjusted $R^2=.527$). This finding is consistent with other research that have linked environmental influences to transfer of training and subsequent changes in job performance (Baumgartel, Reynolds, & Pathan, 1984; Rouiller & Goldstein, 1993; Tracey, Tannenbaum, & Kavanagh, 1995; Xiao, 1996). The present study extends these findings by showing that
environmental variables have a broader influence affecting not only post-training behavior, but also motivation to transfer through perceptions of environmental factors.

The second important finding was the strong influence of organizational commitment early in the regression analysis. The use of hierarchical regression allowed the influence of organizational commitment to be seen in its relationship to other variables in the analysis. In other forms of regression analysis, the influence of organizational commitment on motivation to transfer could have been masked due to the mediation affect by other variables. However, this study suggests that organizational commitment can be an important influence on motivation to transfer. When the general or individual attitude variables were entered into the regression analysis, the model was significant ($p \leq .001$) and explained almost 20% of the variance in motivation to transfer ($R^2 = .198$). Of the three individual attitude variables, only organizational commitment was a significant predictor ($\beta = .412$, $p < .01$). Organizational commitment remained a significant predictor of motivation to transfer until the fourth step of the regression analysis, suggesting it had become fully mediated.

It is interesting that after the first step in the hierarchical regression, in which organizational commitment was a significant predictor, there was not a significant increase in the amount of explained variance above the previous model until the entry of the environmental variables. This suggests that, in this study, motivation to transfer is largely a function of organizational commitment.
and environmental factors. Both organizational commitment and the environmental factors are outside the actual training process. This is a significant finding due to the fact that researchers have frequently attempted to improve training by focusing on training techniques (Clark, et al., 1993). This finding points out the need to take a broader approach to improving training effectiveness. This finding lends a measure of support to Holton's (1996) comprehensive evaluation model because it shows the need to go beyond the variables that are included in the actual training process to determine why training may be effective for some trainees and not for others.

The third important finding was the pattern of changes in the significant predictor variables in the regression, which suggests the possibility of certain relationships. First, organizational commitment remained a significant predictor, though with declining influence, but then was only borderline significant after the entry of the learning variable into the model. This suggests that the reaction variables, situation specific variables, and the learning variable together mediated the relationship between organizational commitment and motivation to transfer. This is consistent with the logical ordering of the conceptual model. Trainees enter training with a certain amount of commitment to the organization, which in turn, influences their motivation to use training. This level of motivation can then be altered by specific attitudes about the training and trainee's reaction to the training after being exposed to the training. The situation specific attitude (training attitude) became significant with the addition of the reaction variables, then non-significant with the addition of the learning variable. The reaction
variables were significant in the fourth model but became non-significant with the addition of the environmental variables. These patterns indicate that training attitudes may be altered once the trainee has experienced and reacted to the training, and the influence of reaction to the training on motivation to transfer can be mediated by perceptions of the transfer environment. In other words, the influence of the trainees' reaction to the training may be dependent on how the trainee perceives the transfer environment, in particular, peer support, supervisor support, and opportunity to use.

The use of hierarchical regression allows for the partitioning of variance which in turn gives suggestions of relationships between variables. This pattern of early-entering variables, that were significant predictors but later become non-significant predictors with the addition of later entering variables, lends a measure of support for the sequencing of variables based on the conceptual model (Holton, 1996).

The fourth key finding was that computer confidence had a significant direct influence on motivation to transfer in the final model. Because computer confidence was entered in the second step of the hierarchical regression but was not a significant predictor until the addition of the environmental variables, this suggests that computer confidence was moderated by the environmental variables. This finding is rather puzzling because it does not follow the expected pattern. One possible explanation is that the influence of supervisors and peers may strengthen the trainee's perceptions of their own abilities to use the computer to access the training and, therefore, benefit from the training.
Another possible explanation is that computers were used, in varying degrees, by the trainees in their day-to-day jobs, therefore, computer confidence may be related to their beliefs in their abilities to use the computer to implement the training back on the job. In their day-to-day jobs a computerized control panel was used to perform the procedures required of their jobs. In the CBT, the trainee had to use the computer to access the lessons and complete the examinations, which necessitated signing on to the computer, accessing the appropriate lessons and exams, and using hypertext to view illustrations and other multimedia enhancements to the lessons. Therefore, these two uses, job related and CBT, of the computer appear to be quite different. Further research is needed to clarify the exact nature of the computer confidence variable's influence on motivation to transfer. However, these findings suggest it would be prudent to take measures to build trainees' computer confidence prior to undertaking CBT.

This study has made a valuable contribution to the field of human resource development because these findings taken together, although an exploratory attempt, suggest that individual attitudes and personality characteristics as well as environmental transfer factors can influence a person's motivation to transfer training, as proposed by Holton (1996) and suggested by Noe (1986). These findings lend a measure of support for the portion of Holton's (1996) comprehensive evaluation model related to motivation to transfer. The use of hierarchical regression allowed the influence of "early" entry variables (e.g., organizational commitment) to be seen and gave
indications of possible moderated and mediated relationships (see James & Brett, 1984). These findings point to the need for examining training from a holistic point of view, looking at antecedents to key variables and outcomes of the training process through comprehensive training models.

**Future Research**

This study highlighted the need for additional research in several areas related to motivation to transfer. The following sections these possible areas of further research.

1.) Limitations of this research included the suspect validity of the learning variable and the fact that pretest were not feasible in this study. One recommendation for future research would be to replicate this study with a better learning measure and administer a pretest prior to the start of training to determine how much learning could be actually attributed to the training. Further research is need to clarify the influence of learning on motivation to transfer, as well as the mediator and/or moderator roles that learning plays between other variables in the conceptual model and motivation to transfer.

2.) This study suggested that internal work motivation may not always have a positive influence on motivation to transfer as had been expected. It is speculated that in a training situation where trainees are forced to take training, such as in government mandated, those trainees who have high levels of internal work motivation may be resentful of being forced to take training. Further research is needed to examine the difference in the influence of internal
work motivation on motivation to transfer when training is mandated versus when trainees have free choice of the types of training they take.

3.) Surprisingly, peer support was a significant predictor of motivation to transfer but supervisor support was not. In the industrial work setting in this study, work groups spent a great deal of time in close proximity. It would be interesting to determine if the influence of peers and supervisors would shift if this study were replicated in different settings with different group structures (e.g., independent/group, office/plant, management/skill worker).

4.) Although this study suggests that computer confidence had an influence on motivation to transfer, it is not clear if the computer confidence was related to the use of computers as the method of training or the use of computers to perform the training back on the job. In this study, the types of computer skills needed to complete the CBT and skills needed to perform the day-to-day operations on the computerized control panel in the units appeared to be quite different. An instrument would need to be developed tailored to determine the computer confidence needed for CBT, that could distinguish between the different types of computer skills by the research participants. Information gained from this type of instrument would help researchers identify the influences of the different types of computer confidence on motivation to transfer training.

5.) James and Brett (1984) stress the need to have a well-specified causal model before attempting confirmatory analysis. This study lends a degree of support to the conceptual model based on a portion of Holton's (1996)
evaluation model, and points to the value of using comprehensive models to examine how to make training more effective. However, further exploratory research is needed, using a larger sample, to test additional variables that could influence motivation to transfer such as: trainee expectations of the training; additional personality characteristics such as self-efficacy and locus of control; degree of intervention fulfilment; and individual abilities.

6.) Although this research focused on motivation to transfer, Holton's model (1996) extends the evaluation to include individual performance and organizational results. Further research is needed to determine how motivation to transfer affects individual performance, as well as how transfer design and transfer climate influence individual performance. Additional research is also needed to determine individual performance and external events affect organizational results. Once the model has been well-specified, more sophisticated confirmatory statistical techniques, such as structural equation modeling (e.g., LISREL), could be used to evaluate all the causal relationships in the model simultaneously (Holton, 1996).
REFERENCES


APPENDIX A
REACTION INSTRUMENT
Relating to the CATS training, for each item below, please indicate how you feel at this time by marking the numbered circle that most closely agrees with your feelings. Use the scale shown below.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Circle Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The instructions were easy to follow.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>2. I was able to understand the meanings all the words used in the lessons.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>3. I enjoyed using the computer to learn the material.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>4. The style of print used was easy to read.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>5. The lines of print on the screen were too close together.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>6. The training was boring.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>7. The graphics (pictures, drawings, and videos) helped me to understand the material.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>8. The graphics (pictures, drawings, and videos) made the lessons more interesting.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>9. It is generally not too noisy in my unit to be able to work on the computer</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>10. The computer is in a well-lighted area in my unit.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>11. The setting for the training made it difficult for me to learn.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>12. I am involved in determining what training is needed in my unit.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>13. I am satisfied with the amount of choice I have in selecting the training I attend.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>14. I would like to be more involved in the design of the training programs.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>15. I am given choices of which training I take.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>16. I learned several new things during the training.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>17. The training reminded me how the steps in the SOP’s should be done.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>18. The training was a waste of my time.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>19. I feel good knowing everyone is being trained on the same standard operating procedures</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td>20. The training covered the areas that I needed training on.</td>
<td>1️⃣ 2️⃣ 3️⃣ 4️⃣ 5️⃣</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>21. I knew the standard operating procedures (SOPs) well enough that I had to spend very little time going over the computer lessons in order to pass the test.</td>
<td>1</td>
</tr>
<tr>
<td>22. I believe the training will increase my future job opportunities at Ciba-Geigy</td>
<td>1</td>
</tr>
<tr>
<td>23. The lessons have motivated me to want to learn more.</td>
<td>1</td>
</tr>
<tr>
<td>24. I believe the training will help me do my current job better.</td>
<td>1</td>
</tr>
<tr>
<td>25. Because of the training, I understand better why it is important to do certain procedures as specified in the SOP's.</td>
<td>1</td>
</tr>
<tr>
<td>26. I plan to use what I learned on the job.</td>
<td>1</td>
</tr>
<tr>
<td>27. There was enough time during my shift to use the computer.</td>
<td>1</td>
</tr>
<tr>
<td>28. The way the information was organized helped me learn.</td>
<td>1</td>
</tr>
<tr>
<td>29. It takes too much time to work through each lesson.</td>
<td>1</td>
</tr>
<tr>
<td>30. I like completing the lessons at my own pace</td>
<td>1</td>
</tr>
<tr>
<td>31. Having the standard operating procedures on the computer will make it easy to find information when I need it in the future.</td>
<td>1</td>
</tr>
<tr>
<td>32. Refresher training on the procedures should be repeated every two years instead of every 3 years as required by law.</td>
<td>1</td>
</tr>
<tr>
<td>33. Training on the computer would be a good way to learn skills I will use in the future.</td>
<td>1</td>
</tr>
<tr>
<td>34. The tests covered the most important information in each lesson.</td>
<td>1</td>
</tr>
<tr>
<td>35. The questions on the test were taken from information that was well covered in the lessons.</td>
<td>1</td>
</tr>
<tr>
<td>36. The tests were not too hard.</td>
<td>1</td>
</tr>
<tr>
<td>37. The computer training I was given before starting the certification lessons, taught me how to go through each lesson with little difficulty.</td>
<td>1</td>
</tr>
<tr>
<td>38. After being shown how to use the computer, I was able to move back and forth among the different study sections and the tests as needed.</td>
<td>1</td>
</tr>
<tr>
<td>39. I do not want to go back to the old way of conducting training.</td>
<td>1</td>
</tr>
<tr>
<td>40. I do better on the tests when I have worked through the lessons alone.</td>
<td>1</td>
</tr>
<tr>
<td>41. It would help me to learn better if I could work with a partner or colleague on the computer.</td>
<td>1</td>
</tr>
<tr>
<td>42. When I get a question wrong on a test, it would be helpful to know why my answer is incorrect.</td>
<td>1</td>
</tr>
</tbody>
</table>
## MOTIVATION TO TRANSFER SCALE

<table>
<thead>
<tr>
<th>Items</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>26. I plan to use what I learned on the job.</td>
<td>.82</td>
</tr>
<tr>
<td>25. Because of the training, I understand better why it is important</td>
<td>.80</td>
</tr>
<tr>
<td>to do certain procedures as specified in the SOP’s.</td>
<td></td>
</tr>
<tr>
<td>24. I believe the training will help me do my current job better.</td>
<td>.75</td>
</tr>
<tr>
<td>17. The training reminded me how the steps in the SOP’s should be</td>
<td>.72</td>
</tr>
<tr>
<td>done.</td>
<td></td>
</tr>
<tr>
<td>20. The training covered the areas that I needed training on.</td>
<td>.56</td>
</tr>
<tr>
<td>19. I feel good knowing everyone is being trained on the same standard</td>
<td>.54</td>
</tr>
<tr>
<td>operating procedures.</td>
<td></td>
</tr>
<tr>
<td>16. I learned several new things during the training.</td>
<td>.53</td>
</tr>
</tbody>
</table>
NAME _______________________________________________ SHIFT#___________________

Please mark the response that best describes you.

<table>
<thead>
<tr>
<th>Item</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I'm looking forward to learning as long as I'm living.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I know what I want to learn.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. When I see something that I don't understand, I stay away from it.</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>4. If there is something I want to learn, I can figure out a way to learn it.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I love to learn.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. It takes me a while to get started on new projects.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7. In a classroom situation, I expect the instructor to tell all class members exactly what to do at all times.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I believe that thinking about who you are, where you are, and where you should be going should be a major part of every person's education.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I don't work very well on my own.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. If I discover a need for information that I don't have, I know where to go to get it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I can learn things on my own better than most people.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>12. Even if I had a great idea, I can't seem to develop a plan for making it work.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. In a learning experience, I prefer to take part in deciding what will be learned and how.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Difficult study doesn't bother me if I'm interested in something.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. No one but me is truly responsible for what I learn.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>16. I can tell whether I'm learning something well or not.</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>17. There are so many things I want to learn that I wish that there were more hours in a day.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. If there is something I have decided to learn, I can find time for it, no matter how busy I am.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>19. Understanding what I read is a problem for me.</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>20. If I don't learn, it's not my fault.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. I know when I need to learn more about something.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Code</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. If I can understand something well enough to get by, it doesn't bother me if I still have questions about it.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. I think libraries are boring places.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. The people I admire most are always learning new things.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. I can think of many different ways to learn about a new topic.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. I try to relate what I am learning to my long-term goals.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. I am capable of learning for myself almost anything I need to know.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. I really enjoy tracking down the answer to a question.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. I don't like dealing with questions where there is not one right answer.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. I have a lot of curiosity about things.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. I'll be glad when I'm finished learning.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. I'm not as interested in learning as other people seem to be.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. I don't have any problem with basic study skills.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34. I like to try new things even if I'm not sure how they will turn out.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35. I don't like it when people who really know what they're doing point out mistakes that I am making</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36. I'm good at thinking of unusual ways to do things.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37. I like to think about the future.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38. I'm better than most people are at trying to find out the things I need to know.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39. I think of problems as challenges, not stop signs.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40. I can make myself do what I think I should.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41. I'm happy with the way I investigate problems.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42. I become a leader in group learning situations.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>43. I enjoy discussing ideas.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44. I don't like challenging learning situations.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45. I have a strong desire to learn new things.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46. The more I learn, the more exciting the world becomes.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47. Learning is fun.</td>
<td>1 2 3 4 5</td>
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</tr>
<tr>
<td>48.</td>
<td>It's better to stick with the learning methods that we know will work instead of always trying new ones.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>49.</td>
<td>I want to learn more so that I can keep growing as a person.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50.</td>
<td>I am responsible for my learning - no one else is.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51.</td>
<td>Learning how to learn is important to me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52.</td>
<td>I will never be too old to learn new things.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53.</td>
<td>Constant learning is a bore.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54.</td>
<td>Learning is a tool for life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55.</td>
<td>I learn several new things on my own each year.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>56.</td>
<td>Learning doesn't make any difference in my real life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>57.</td>
<td>I am an effective learner in a classroom situation and on my own.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>58.</td>
<td>Learners are leaders.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Almost never true  Usually not true (less than half the time)  Sometimes true (about half the time)  Usually true (more than half the time)  Almost always true
APPENDIX D
LOVE OF LEARNING SCALE ITEMS AND LOADINGS
### LOVE OF LEARNING SCALE

<table>
<thead>
<tr>
<th>Items</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>46. The more I learn, the more exciting the world becomes.</td>
<td>.79</td>
</tr>
<tr>
<td>47. Learning is fun.</td>
<td>.66</td>
</tr>
<tr>
<td>49. I want to learn more so that I can keep growing as a person.</td>
<td>.62</td>
</tr>
<tr>
<td>45. I have a strong desire to learn new things.</td>
<td>.61</td>
</tr>
<tr>
<td>52. I will never be too old to learn.</td>
<td>.60</td>
</tr>
<tr>
<td>53. Constant learning is a bore.</td>
<td>.60</td>
</tr>
<tr>
<td>54. Learning is a tool for life.</td>
<td>.60</td>
</tr>
<tr>
<td>51. Learning how to learn is important to me.</td>
<td>.59</td>
</tr>
<tr>
<td>01. I'm looking forward to learning as long as I'm living.</td>
<td>.59</td>
</tr>
<tr>
<td>05. I love to learn.</td>
<td>.55</td>
</tr>
<tr>
<td>31. I'll be glad when I'm finished learning.</td>
<td>.45</td>
</tr>
<tr>
<td>43. I enjoy discussing ideas.</td>
<td>.42</td>
</tr>
<tr>
<td>55. I learn several new things on my own each year.</td>
<td>.40</td>
</tr>
</tbody>
</table>
APPENDIX E
JOB ATTITUDE SURVEY INSTRUMENT
Ciba-Geigy Corp.
Job Attitude Survey

NAME ________________________________________________ SHIFT#______________

For these items, please think how you feel about the organization for which you are now working and the job you are now in. Mark the response that most closely matches your opinion.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither agree nor disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Overall, I am satisfied with my current job.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I am generally satisfied with the kind of work I do in this job.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3. I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful.</td>
<td></td>
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</tr>
<tr>
<td>4. I boast about this organization to my friends as a great organization to work for.</td>
<td></td>
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</tr>
<tr>
<td>5. I would accept almost any type of job assignment in order to keep working for this organization.</td>
<td></td>
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<tr>
<td>6. I find that my values and the organization's values are very similar.</td>
<td></td>
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</tr>
<tr>
<td>7. I am proud to tell others that I am part of this organization.</td>
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<tr>
<td>8. This organization really inspires the very best in me in the way of job performance.</td>
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<tr>
<td>9. I am glad that I chose this organization to work for over others I was considering at the time I joined.</td>
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<tr>
<td>10. I really care about the fate of this organization.</td>
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</tr>
<tr>
<td>11. Given what I know about other organizations, this is the best organization for me.</td>
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</tr>
<tr>
<td>12. I feel a great sense of personal satisfaction when I do my job well.</td>
<td></td>
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</tr>
<tr>
<td>15. The major satisfaction in my life comes from my job.</td>
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<tr>
<td>16. The most important things that happen to me involve my work.</td>
<td></td>
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<td></td>
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<tr>
<td>17. I live, eat, and breathe my job.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>18. I am very much involved personally in my work.</td>
<td></td>
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<tr>
<td>19. I often think of quitting this job.</td>
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<tr>
<td>20. I expect to begin searching for another job in the next year.</td>
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<tr>
<td>21. I expect to resign from this job within the next year.</td>
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</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither agree nor disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.</td>
<td>I have not been especially proud of my performance in my job lately.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>23.</td>
<td>Generally, I feel I am achieving my most important personal work goals.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>24.</td>
<td>On the basis of my own standards, I feel I have been successful in my work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>25.</td>
<td>I get a great sense of accomplishment in my job.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>26.</td>
<td>I often feel really good about the quality of my work performance.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>27.</td>
<td>Compared to my peers, I feel quite successful in my career.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
APPENDIX F
INTERNAL WORK MOTIVATION SCALE ITEMS AND LOADINGS
### INTERNAL WORK MOTIVATION SCALE

<table>
<thead>
<tr>
<th>Items</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. I feel a great sense of personal satisfaction when I do my job well.</td>
<td>.69</td>
</tr>
<tr>
<td>13. Doing my job well increases my feeling of self-esteem.</td>
<td>.67</td>
</tr>
<tr>
<td>26. I often feel really good about the quality of my work performance.</td>
<td>.57</td>
</tr>
</tbody>
</table>
APPENDIX G
ORGANIZATIONAL COMMITMENT SCALE ITEMS AND LOADINGS
<table>
<thead>
<tr>
<th>Items</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>07. I am proud to tell others that I am part of this organization.</td>
<td>.85</td>
</tr>
<tr>
<td>10. I really care about the fate of this organization.</td>
<td>.58</td>
</tr>
<tr>
<td>04. I boast about this organization to my friends as a great</td>
<td>.57</td>
</tr>
<tr>
<td>organization to work for.</td>
<td></td>
</tr>
<tr>
<td>06. I find that my values and the organization’s values are</td>
<td>.55</td>
</tr>
<tr>
<td>very similar.</td>
<td></td>
</tr>
<tr>
<td>01. Overall, I am satisfied with my current job.</td>
<td>.55</td>
</tr>
<tr>
<td>11. Given what I know about other organizations, this is the best</td>
<td>.54</td>
</tr>
<tr>
<td>organization for me.</td>
<td></td>
</tr>
<tr>
<td>08. The organization really inspires the very best in me in the way</td>
<td>.51</td>
</tr>
<tr>
<td>of job performance.</td>
<td></td>
</tr>
<tr>
<td>02. I am generally satisfied with the kind of work I do in this job.</td>
<td>.49</td>
</tr>
<tr>
<td>03. I am willing to put in a great deal of effort beyond that</td>
<td>.45</td>
</tr>
<tr>
<td>normally expected in order to help this organization be</td>
<td></td>
</tr>
<tr>
<td>successful.</td>
<td></td>
</tr>
<tr>
<td>05. I would accept almost any type of job assignment in order to</td>
<td>.43</td>
</tr>
<tr>
<td>keep working for this organization.</td>
<td></td>
</tr>
<tr>
<td>09. I am glad that I chose this organization to work for over others</td>
<td>.39</td>
</tr>
<tr>
<td>I was considering at the time I joined.</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX H
COMPUTER ATTITUDES INSTRUMENT
<table>
<thead>
<tr>
<th>Item</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Computers do not scare me at all.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I like working with computers.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3. Working with a computer would make me very nervous.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4. I do not feel threatened when others talk about computers.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. It wouldn't bother me at all to attend a computer training program.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6. I'm not good with computers.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>7. The challenge of using computers in my work does not appeal to me.</td>
<td></td>
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</tr>
<tr>
<td>8. Computers make me feel uncomfortable.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>9. Generally I feel OK about trying to solve problems on a computer.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>10. I would feel at ease in a computer class.</td>
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</tr>
<tr>
<td>11. I think working with a computer would be enjoyable and stimulating.</td>
<td></td>
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</tr>
<tr>
<td>12. I don't think I would enjoy doing advanced computer work.</td>
<td></td>
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</tr>
<tr>
<td>13. Figuring out computer problems does not appeal to me.</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>14. I get a sinking feeling when I think of trying to use a computer.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>15. I am sure I could do work with computers.</td>
<td></td>
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<tr>
<td>16. I would feel comfortable working with a computer.</td>
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</tr>
<tr>
<td>17. When there is a problem with a computer that I can't immediately solve, I would stick with it until I have the answer.</td>
<td></td>
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<tr>
<td>18. I'm not the type to do well with computers.</td>
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<tr>
<td>19. I don't understand how some people can spend so much time working with computers and seem to enjoy it.</td>
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<tr>
<td>20. I am sure I could learn to use a computer program.</td>
<td></td>
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<tr>
<td>21. Once I start to work with a computer, I would find it hard to stop.</td>
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<tr>
<td>22. I think using a computer would be very hard for me.</td>
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<tr>
<td>23. I will do as little work with computers as possible.</td>
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<tr>
<td>24. Computers make me feel uneasy and confused.</td>
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<tr>
<td>25. If a problem is left unsolved in a computer class, I would continue to think about it afterward.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>26. I could get good grades in computer courses.</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>27. I do not enjoy talking with others about computers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. I do not think I could handle a computer course.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>29. I have a lot of self-confidence when it comes to working with computers.</td>
<td></td>
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</tr>
</tbody>
</table>

NAME ________________________
SHIFT# ______________________

For each item below, please indicate how you feel at this time by marking the numbered circle that most closely agrees with your feelings. Use the scale shown below.
APPENDIX I
COMPUTER CONFIDENCE SCALE ITEMS AND LOADINGS
<table>
<thead>
<tr>
<th>Items</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>01. Computers do not scare me at all.</td>
<td>.77</td>
</tr>
<tr>
<td>29. I have a lot of self-confidence when it comes to working with</td>
<td>.75</td>
</tr>
<tr>
<td>computers.</td>
<td></td>
</tr>
<tr>
<td>09. Generally, I feel OK about trying to solve problems on a</td>
<td>.73</td>
</tr>
<tr>
<td>computer.</td>
<td></td>
</tr>
<tr>
<td>06. I'm no good with computers.</td>
<td>.71</td>
</tr>
<tr>
<td>24. Computers make me feel uneasy and confused.</td>
<td>.69</td>
</tr>
<tr>
<td>08. Computers make me feel uncomfortable.</td>
<td>.68</td>
</tr>
<tr>
<td>04. I do not feel threatened when others talk about computers.</td>
<td>.65</td>
</tr>
<tr>
<td>14. I get a sinking feeling when I think of trying to use a</td>
<td>.57</td>
</tr>
<tr>
<td>computer.</td>
<td></td>
</tr>
<tr>
<td>22. I think using a computer would be very hard for me.</td>
<td>.49</td>
</tr>
<tr>
<td>16. I would feel comfortable working with a computer.</td>
<td>.41</td>
</tr>
</tbody>
</table>
APPENDIX J
START INSTRUMENT
<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tbody>
</table>

Page 1

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21. I go over training exercises when reviewing what I have learned in a training program.  
   Very much typical of me  
   Fairly typical of me  
   Somewhat typical of me  
   Not very typical of me  
   Not at all typical of me

22. I am able to distinguish between more important and less important information during a training presentation.  
   a b c d e

23. I find it hard to make time for working with training materials.  
   a b c d e

24. I believe training programs are important for professional development.  
   a b c d e

25. I am nervous if the instructor asks me a question during a training session.  
   a b c d e

26. After a training session, I review the material to help me understand it better.  
   a b c d e

27. It is more important to complete a training program than to really understand the material being presented.  
   a b c d e

28. As long as I get good raises or promotions, I do not care whether or not I participate in training.  
   a b c d e

29. Even when training materials are dull and uninteresting, I manage to keep working until I finish.  
   a b c d e

30. I use headings as a guide to identify important information in training materials.  
   a b c d e

31. I make good use of the time I set aside for studying training materials.  
   a b c d e

32. I test myself to make sure I really understand the information being presented in a training program.  
   a b c d e

33. I feel nervous about making mistakes during a training session.  
   a b c d e

34. When I am participating in training, I try to make everything I am learning fit together logically.  
   a b c d e

35. I would rather not participate in training.  
   a b c d e

36. I don't understand some of the information presented during training because my mind wanders.  
   a b c d e

37. When studying training materials, I try to think through a topic and decide what I am supposed to learn rather than just read it over.  
   a b c d e

38. I am unable to concentrate well during training because of restlessness or moodiness.  
   a b c d e

39. I try to relate what I am learning in a training program to my own experiences.  
   a b c d e

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<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>40.</td>
<td>When it comes to studying training materials, a b c d e</td>
<td>procrastination is a problem for me.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41.</td>
<td>Even when I am well prepared for a training evaluation, I feel a b c d e</td>
<td>very anxious.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42.</td>
<td>Outside commitments keep me from spending enough time going a b c d e</td>
<td>over training materials.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>43.</td>
<td>I am easily distracted from studying training materials. a b c d e</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44.</td>
<td>I am tense during training. a b c d e</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45.</td>
<td>I find it easy to pay attention during training presentations. a b c d e</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46.</td>
<td>I try hard not to miss any of the sessions during a training program. a b c d e</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47.</td>
<td>I try to find relationships between what I already know and what I am learning during training. a b c d e</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48.</td>
<td>I put off completing outside work assigned during training sessions. a b c d e</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>49.</td>
<td>I worry that I will not learn the material covered during training. a b c d e</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50.</td>
<td>When training materials are difficult, I either give up or study only a b c d e</td>
<td>the easy parts.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51.</td>
<td>It is hard for me to decide what is important to underline or highlight a b c d e</td>
<td>in written training materials.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52.</td>
<td>I review my notes before each training session. a b c d e</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53.</td>
<td>I try to see how what I am learning in a training program would a b c d e</td>
<td>apply to my day-to-day job responsibilities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>54.</td>
<td>I often have difficulty identifying the training information that a b c d e</td>
<td>will most be useful to me in performing my job.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55.</td>
<td>I stop periodically while studying training materials and mentally go a b c d e</td>
<td>over or review what was presented.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>56.</td>
<td>I try to identify the important ideas when I listen to a training a b c d e</td>
<td>presentation.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You have now completed START.
APPENDIX K
TRAINING ATTITUDES SCALE ITEMS AND LOADINGS
## TRAINING ATTITUDES SCALE

<table>
<thead>
<tr>
<th>Items</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>28. As long as I get good raises or promotions, I do not care whether or not I participate in training.</td>
<td>.75</td>
</tr>
<tr>
<td>27. It is more important to complete a training program than to really understand the material being.</td>
<td>.59</td>
</tr>
<tr>
<td>35. I would rather not participate in training.</td>
<td>.57</td>
</tr>
<tr>
<td>24. I believe training programs are important for professional development.</td>
<td>.51</td>
</tr>
<tr>
<td>53. I try to see how what I am learning in a training program would apply to my day-to-day job responsibilities.</td>
<td>.46</td>
</tr>
<tr>
<td>04. In my opinion, what is taught in most training programs is not worth learning.</td>
<td>.44</td>
</tr>
<tr>
<td>46. I try hard not to miss any of the sessions during a training program.</td>
<td>.43</td>
</tr>
</tbody>
</table>
APPENDIX L
LEARNING ENVIRONMENT SCALE ITEMS AND LOADINGS
<table>
<thead>
<tr>
<th>Items</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. The computer is in a well-lighted area in my unit.</td>
<td>.76</td>
</tr>
<tr>
<td>11. The setting for the training made it difficult for me to learn. (RC)</td>
<td>.71</td>
</tr>
<tr>
<td>09. It is generally not too noisy in my unit to be able to work on the computer.</td>
<td>.55</td>
</tr>
<tr>
<td>27. There was enough time during my shift to use the computer.</td>
<td>.54</td>
</tr>
</tbody>
</table>
APPENDIX M
TRANSFER CLIMATE INSTRUMENT
Ciba-Geigy Corp.
TRANSFER CLIMATE-HPF

NAME _________________________________________________ SHIFT#______________

Thinking about CATS training, please indicate how you feel at this time by marking the numbered circle that most closely agrees with your feelings for each item. Use the scale shown below.

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

---

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

My Supervisor

1. ....discusses performance expectations (based on training) with me shortly after the training is completed.
   1 2 3 4 5

2. ....sets goals for me which encourage me to apply my training on the job.
   1 2 3 4 5

3. ....expects me to make use of my training.
   1 2 3 4 5

4. ....helps me set realistic goals for job performance based on my training.
   1 2 3 4 5

5. ....makes sure that I have opportunities to use my training immediately.
   1 2 3 4 5

6. ....provides occasional practice sessions for important but seldom used skills.
   1 2 3 4 5

7. ....is knowledgeable concerning areas in which I receive training.
   1 2 3 4 5

8. ....meets with me to discuss ways to apply training on the job.
   1 2 3 4 5

9. ....has me share my training experience and learning with colleagues on the job.
   1 2 3 4 5

10. ....gives me instructions on how to do the job, which are the same as those learned in training.
    1 2 3 4 5

11. ....involves me in work related decisions based on my training.
    1 2 3 4 5

12. ....meets regularly with me to work on problems I may be having in trying to use my training.
    1 2 3 4 5

13. ....shows interest in what I learn in training.
    1 2 3 4 5

14. ....eases the pressures of work for a short time so I have a chance to practice my new skills.
    1 2 3 4 5

15. ....lets me know I am doing a good job when I use my training.
    1 2 3 4 5

16. ....appreciates my operating the unit as taught in training.
    1 2 3 4 5

17. ....refuses to accept statements or actions from me that are different from those learned in training.
    1 2 3 4 5

18. ....opposes the use of the techniques learned in training that I bring to the unit.
    1 2 3 4 5
<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. My Supervisor</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. ...does not notice me when I use my training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20. ...is involved in determining what training is needed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>21. ...doesn't seem to care whether I use my training or not.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>22. ...pays only lip service to the value and usefulness of training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>23. ...and I discuss problems in using my training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>24. ...assigns me to work with more experienced colleagues, after training, until I become familiar with the new practices.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>25. ...phrases statements or actions in terms that I can recognize as coming from the training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>26. ...can be counted on to give me answers to questions about the use of training on the job.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>27. ...gives me praise such as telling me I have performed well when I use my training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>28. ...would use different techniques than those I would be using if I use my training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>29. ...thinks I am being ineffective when I use the techniques taught in training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>My Colleagues</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. ...have the technical knowledge to help me use the techniques learned in training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>31. ...appreciate my operating the unit as taught in training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>32. ...encourage me to use the skills I learned in training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>33. ...do not use the skills they are taught in training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>34. ...and I have a lot of interaction on the job.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>35. ...think I am being ineffective when I use the techniques taught in training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>36. ...and I discuss how to apply our training on the job.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>37. ...and I discuss problems that arise in using training techniques.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>38. ...and my advisor help each other resolve difficult problems relating to the use of training on the job.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>39. ...in this unit expect me to perform my job in a manner that is consistent with my training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
188

Thinking about on-the-job......

40. The skills I learned in training could be used in my job but I prefer to use the old methods.
   1 2 3 4 5

41. The jobs are designed in such a way as to allow me to use the skills taught in training.
   1 2 3 4 5

42. Training aids are available on the job to support what I learned in training.
   1 2 3 4 5

43. Information describing the procedures taught in training is available to me after training if I need them to complete my work.
   1 2 3 4 5

44. Equipment is available in this unit that allows me to use the skills I gained in training.
   1 2 3 4 5

45. Equipment illustrated in the training does not operate the same way as the equipment in this unit.
   1 2 3 4 5

46. There are enough human resources available in my unit to allow me to use skills learned in training.
   1 2 3 4 5

47. The financial resources are available that will allow me to use skills acquired in training.
   1 2 3 4 5

48. I am able to use the procedures taught in training even if others do not.
   1 2 3 4 5

49. The materials and supplies are available to me to allow me to use the skills and knowledge learned in training.
   1 2 3 4 5

50. I am not allowed enough time to do my job as taught in the training program.
   1 2 3 4 5

51. If I successfully use my training, I will receive a salary increase.
   1 2 3 4 5

52. The use of training on the job can help me meet some of the career development plans I have.
   1 2 3 4 5

53. If I do not use my training I am unlikely to get a raise.
   1 2 3 4 5

54. If I do not use new techniques taught in training I will be reprimanded.
   1 2 3 4 5

55. More experienced colleagues ridicule me when I use the techniques I learned in training.
   1 2 3 4 5

56. Following the procedures and policies taught in training results in my being told that I am not performing correctly.
   1 2 3 4 5

57. The skills taught in training do not fit the "image" of my work group.
   1 2 3 4 5

58. I am afraid colleagues will think I am weak if I use the new skills learned in training.
   1 2 3 4 5

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<table>
<thead>
<tr>
<th>Thinking about on-the-job.......</th>
</tr>
</thead>
<tbody>
<tr>
<td>59. I do not know how training contributes to my advancement in the unit.</td>
</tr>
<tr>
<td>60. The standard operating procedures taught in the training are correct.</td>
</tr>
<tr>
<td>61. Skills and knowledge taught in the training are the same skills and knowledge needed to do a good job. During CATS training.......</td>
</tr>
<tr>
<td>62. ....I am taught how to use my new skills in assigned units.</td>
</tr>
<tr>
<td>63. ....I practice using the skills taught.</td>
</tr>
<tr>
<td>64. ....I learn how to handle mistakes that I might make later on the job.</td>
</tr>
<tr>
<td>65. ....I am taught how to apply my new knowledge back on the job.</td>
</tr>
<tr>
<td>66. ....I am allowed to practice handling real and job related problems.</td>
</tr>
</tbody>
</table>
APPENDIX N
CONTENT VALIDITY SCALE ITEMS AND LOADINGS
## CONTENT VALIDITY SCALE

<table>
<thead>
<tr>
<th>Items</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>60. The standard operating procedures taught in the training are correct.</td>
<td>.59</td>
</tr>
<tr>
<td>61. Skills and knowledge taught in the training are the same skills and knowledge needed to do a good job.</td>
<td>.53</td>
</tr>
<tr>
<td>45. Equipment illustrated in the training does not operate the same way as the equipment in this unit. (RC)</td>
<td>-.46</td>
</tr>
</tbody>
</table>

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APPENDIX O
SUPervisor Support Scale Items and Loadings
SUPERVISOR SUPPORT SCALE

Items Loadings
12. My advisor meets regularly with me to work on problems I may be having in trying to use my training. .87
08. My advisor meets with me to discuss ways to apply training on the job. .79
04. My advisor helps me set realistic goals for job performance based on my training. .79
01. My advisor discusses performance expectations (based on training) with me shortly after the training is completed. .75
27. My advisor gives me praise such as telling me I have performed well when I use my training. .74
13. My advisor shows interest in what I learn in training. .72
02. My advisor sets goals for me which encourage me to apply my training on the job. .69
15. My advisor lets me know I am doing a good job when I use my training. .69
14. My advisor eases the pressures of work for a short time so I have a chance to practice my new skills. .64
11. My advisor involves me in work related decisions based on my training. .64
05. My advisor makes sure that I have opportunities to use my training immediately. .61
09. My advisor has me share my training experience and learning with colleagues on the job. .54
06. My advisor provides occasional practice sessions for important but seldom used skills. .52
10. My advisor gives me instructions on how to do the job, which are the same as those learned in training. .50
26. My advisor can be counted on to give me answers to questions about the use of training on the job. .50
23. My advisor and I discuss problems in using my training. .50
38. My colleagues and my advisor help each other resolve difficult problems related to the use of training on the job. .46
16. My advisor appreciates my operating the unit as taught in training. .44
24. My advisor assigns me to work with more experienced colleagues, after training, until I become familiar with the new practice. .44
20. My advisor is involved in determining what training is needed. .43
25. My advisor phrases statements or actions in terms that I can recognize as coming from the training. .42
03. My advisor expects me to make use of my training. .40
19. My advisor does not notice me when I use my training. -.43
APPENDIX P
SUPERVISOR SANCTIONS SCALE ITEMS AND LOADINGS
## SUPERVISOR SANCTIONS SCALE

<table>
<thead>
<tr>
<th>Items</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. My advisor opposes the use of the techniques learned in training that I bring to the unit.</td>
<td>.58</td>
</tr>
<tr>
<td>21. My advisor doesn't seem to care whether I use my training or not.</td>
<td>.56</td>
</tr>
<tr>
<td>22. My advisor pays only lip service to the value and usefulness of training.</td>
<td>.53</td>
</tr>
<tr>
<td>29. My advisor thinks I am being ineffective when I use the techniques taught in training.</td>
<td>.48</td>
</tr>
<tr>
<td>28. My advisor would use different techniques than those I would be used if I my training.</td>
<td>.41</td>
</tr>
<tr>
<td>50. I am not allowed enough time to do my job as taught in the training program.</td>
<td>.40</td>
</tr>
</tbody>
</table>
APPENDIX Q
PEER SUPPORT SCALE ITEMS AND LOADINGS
### PEER SUPPORT SCALE

<table>
<thead>
<tr>
<th>Items</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>30. My colleagues have the technical knowledge to help me use the techniques learned in training.</td>
<td>.74</td>
</tr>
<tr>
<td>32. My colleagues encourage me to use the skills I learned in training.</td>
<td>.72</td>
</tr>
<tr>
<td>31. My colleagues appreciate my operating the unit as taught in training.</td>
<td>.57</td>
</tr>
<tr>
<td>39. My colleagues in this unit expect me to perform my job in a manner that is consistent with my training.</td>
<td>.56</td>
</tr>
<tr>
<td>36. My colleagues and I discuss how to apply our training on the job.</td>
<td>.50</td>
</tr>
<tr>
<td>33. My colleagues do not use the skills they are taught in training. My colleagues think I am being ineffective when I use the techniques taught in training.</td>
<td>- .44</td>
</tr>
<tr>
<td>35.</td>
<td>- .45</td>
</tr>
</tbody>
</table>
APPENDIX R
OPPORTUNITY TO USE SCALE ITEMS AND LOADINGS
**OPPORTUNITY TO USE SCALE**

<table>
<thead>
<tr>
<th>Items</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>49. The materials and supplies are available to me to allow me to use the skills and knowledge learned in training.</td>
<td>.80</td>
</tr>
<tr>
<td>43. Information describing the procedures taught in training is available to me after training if I need them to complete my work.</td>
<td>.72</td>
</tr>
<tr>
<td>47. The financial resources are available that will allow me to use skills acquired in training.</td>
<td>.60</td>
</tr>
<tr>
<td>42. Training aids are available on the job to support what I learned in training.</td>
<td>.59</td>
</tr>
<tr>
<td>46. There are enough human resources available in my unit to allow me to use skills learned in training.</td>
<td>.53</td>
</tr>
<tr>
<td>44. Equipment is available in the unit that allows me to use the skills I gained in training.</td>
<td>.51</td>
</tr>
<tr>
<td>48. I am able to use the procedures taught in training even if others do not.</td>
<td>.46</td>
</tr>
<tr>
<td>Motivation to transfer</td>
<td>RUTIL</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Love of learning</td>
<td>LLOVE</td>
</tr>
<tr>
<td>Organizational commitment</td>
<td>JCOM</td>
</tr>
<tr>
<td>Internal work motivation</td>
<td>JMOTIV</td>
</tr>
<tr>
<td>Training attitudes</td>
<td>SATT</td>
</tr>
<tr>
<td>Computer confidence</td>
<td>CCONF</td>
</tr>
<tr>
<td>Reaction to the learning environment</td>
<td>RENV</td>
</tr>
<tr>
<td>Reaction to the content validity</td>
<td>TCONT</td>
</tr>
<tr>
<td>Learning</td>
<td>LEARN_AVG</td>
</tr>
<tr>
<td>Supervisor support</td>
<td>TSUPSUP</td>
</tr>
<tr>
<td>Supervisor sanction</td>
<td>TSUPSAN</td>
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Partial Residual Plot

Dependent Variable: RUTIL

LLOVE

RUTIL

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Partial Residual Plot

Dependent Variable: RUTIL

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Partial Residual Plot
Dependent Variable: RUTIL

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Partial Residual Plot
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Partial Residual Plot

Dependent Variable: RUTIL
Partial Residual Plot

Dependent Variable: RUTIL

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Partial Residual Plot
Dependent Variable: RUTIL

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APPENDIX T
RESIDUAL/PREDICTED VALUE PLOT
Graph
Normal P-P Plot of Regression Standardized

Dependent Variable: RUTIL
APPENDIX V
CORRELATION TABLE
### Pearson Correlation Table

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*ps.05 **ps.01 ***ps.001
Dian Lampkin Seyler is a native of Mississippi where she received a bachelor of science from Mississippi State University in Home Economics with an emphasis in Clothing and Textiles. Ms. Seyler graduated with "Highest Distinction" and was awarded the "Outstanding Student Award" from Gamma Sigma Delta. After graduation Ms. Seyler worked as a buyer for a lady's clothing store for 10 years.

In 1988, she moved with her family to Baton Rouge, Louisiana, where she began work on a master of science degree in Human Ecology at Louisiana State University. She completed her degree in 1991, with an emphasis in Family, Child, and Consumer Science. After completing her master of science degree, Ms. Seyler contracted with the Louisiana Council on Child Abuse to evaluate a child abuse prevention program and later worked on a grant for the Louisiana Cooperative Extension Service.

Ms. Seyler began work on a doctor of philosophy degree in Vocational Education in 1993 at Louisiana State University. She will graduate in May of 1997, having completed the requirements for a doctor of philosophy degree with an emphasis in Human Resource Development and a minor in Marketing.

Ms. Seyler has had papers presented at both the 1996 and 1997 annual conference of the Academy of Human Resource Development. She has also published two articles related to work and family, as well as, two articles in the field of Human Resource Development.
Candidate: Dian Lampkin Seyler

Major Field: Vocational Education

Title of Dissertation: Factors Affecting Motivation to Use Computer-Based Training

Date of Examination: March 17, 1997