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THE TRANSFER OF TRAINING PROCESS

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Abstract

This study tested Marguerite Foxon's 1993 proposal of a Transfer of Training Process. The transfer of supervisor/management training was evaluated for municipal workers in two southwestern metropolitan areas. The measurement of transfer was based upon self-reporting by the training participants who completed two surveys: one at the conclusion of training and another 30 days after training. Analysis of the data included calculations of instrument reliability, tests for normality, and multicoliniarity. Path analysis of the initial and proposed models for the transfer process was based on variable correlation, stepwise regression, and mediation tests.

Regression tests of the transfer model showed general support for Foxon's proposal. However, the relationships between the stages of transfer indicated mediation that was not included in the original model. The relationship between the intention to transfer variable and the maintained transfer variable was very strong with intention to transfer mediating the effects of all of the other variables on maintained transfer. The relationship between initiation of transfer variable and partial transfer variable was also quite strong with partial transfer mediating the effects of the other variables on initiation of transfer.

Based on the results of data analysis, a new model of the transfer process is proposed. The effects of organizational support and reaction to training are included along with the stages of transfer in the new proposal. Additionally, the partial transfer variable is redefined and placed into the process in three places: partial intention to transfer, partial initiation of transfer, and extent of transfer.

Chapter 1: Introduction

Although the transfer of learning is described by many as the ultimate goal of the teaching and learning process, trainers often find difficulty in overcoming the problems involved with reaching this goal (McKeough, Lupart, & Marini, 1995). There are many benefits associated with training transfer. They range from attitudinal to financial. When members of an organization are successfully learning and applying learning to meet an organization's goals, a number of positive characteristics are likely present. Goals and expectations are likely to be clear and aligned throughout the organization. Rewards align with the goals and are valued by the recipients. Supervisors are supporting the learning activities in which their employees participate, and the supervisors are actively participating in the training process. Peers are supportive. Learners are intelligent and motivated. Employees have the opportunity to apply, practice, improve, and mature their skills either in a controlled environment or on the job. The environment into which training is transferred is consistent with the perceptions and expectations of leadership, and because of that alignment, the financial outcomes and results of the organization are improved. While abundant research exists on the overall outcome of *transfer of training* (and the factors associated with it)*,* research dealing with the transfer of training process is scarce.

Almost all organizations measure the effectiveness of training at some level. Kirkpatrick's (1998) four-level training evaluation model is the most referenced model sited in the literature and most commonly referenced by professional organizations (Garavaglia, 1993). Level 1 is the lowest level of Kirkpatrick's hierarchy, and it

comprises learners' reactions to the training they have just received. Seventy-five

percent of organizations evaluate at this level (ASTD, 2003). Level 2 evaluation is the

assessment of the course learning objectives. Forty-one percent of organizations

evaluate at this level (ASTD, 2003). Level 3 evaluation is the measure of transfer of

training. Twenty-one percent of organizations evaluate at this level (ASTD, 2003).

Level 4 evaluation is a measurement of training's effect on business results. Only 11%

of organizations evaluate at this level (ASTD, 2003). Unfortunately, the higher levels of

the hierarchy (which provide the most complete information about the effectiveness

of training) are measured least (Kirkpatrick, 1998).

Even though only 21 percent of organizations measure transfer of training,

businesses are very interested in their employees' ability to transfer to the workplace

the training they have received. In fact, training has very little value to organizations

unless it is transferred in some way to performance (Holton, Bates, Seyler, & Carvalho,

1997). The investment that companies make to train employees is growing. The

American Society for Training and Development (ASTD) stated that the average annual

expenditure for training in 2005 was $1,424 per employee. This represented an

increase of about 4% from the previous year (ASTD, 2006). Hours employees spend in

formal training are also increasing. Employees averaged 41 hours of formal learning in

2005 (ASTD, 2006). Unfortunately, employees are not transferring all of that training

to the workplace. In a study of training professionals, Saks and Belcourt (2006) found

that six months after training only 44% of trainees applied the skills they learned to the

job, and that number dropped to 34% after a year. This diminishing value of training in

spite of the increasing investment made by companies is *the* problem that dominates the current interest in the topic. The evolving practice of training for transfer emphasizes increased learner performance, increased accountability (supported by increased research data), and increased organizational return on investment.

Purpose

Because the transfer of training is "the effective and continuing application by trainees to their jobs, of the knowledge and skills gained in training…" (Broad & Newstrom, 1992, p. 6), research must be conducted well after participants have completed training and returned to their jobs when the transfer of training is more relevant. Valuable information about the whole process of preparation for learning, engaging in learning, assimilating knowledge, and the process of putting it into action following training can be generated if the experiences of learners and practitioners can be better understood. The specific purpose of this research is to evaluate a model for the transfer of training process. Specifically, the following questions are investigated:

1. What is the relationship between each stage of Foxon's Transfer of Training Process?

2. What is the relationship between a learner's reaction to training, perceived organizational support of the training, and intention to transfer the training?

3. What is the relationship between a learner's reaction to training, perceived organizational support, and each stage of Foxon's Transfer of Training Process?

Theoretical Framework

Because it is so affected by many factors before, during and after, transfer of training should not be viewed as a single outcome. "As an alternative to the transfer-as-product approach, transfer is better conceptualized as a process with various stages through which transfer can be tracked" (Foxon, 1993, p. 132). This process is proposed to consist of prerequisite stages beginning with the intention to transfer.

Figure 1. Stages of the Transfer Process
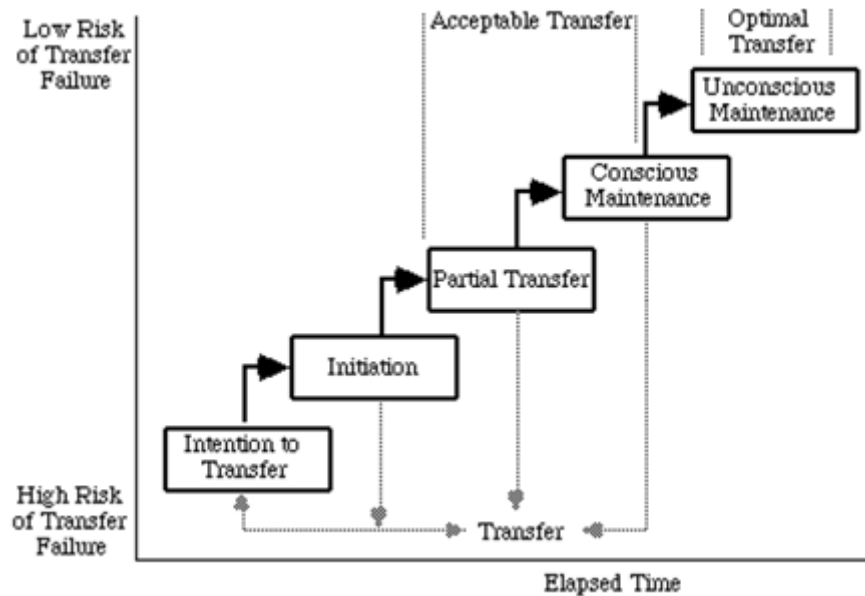
(Foxon, 1993)

Intention to transfer is defined as the end-of-training motivation of an individual to transfer what has been learned. Foxon (1993) proposed that students leaving training with relatively low levels of intention to transfer would be at a higher risk of never putting into practice what has been learned. Intention is followed by initiation. Transfer initiation is the first attempt to apply what has been learned on the job (Laker, 1990). Opportunity to initiate and success of initiation are key factors that

determine which skills might be transferred and which skills might not be. Partial

transfer is the stage that deals with the combination of skills that have been

transferred successfully and the skills that have not. Transfer failure ultimately occurs

when the student stops attempting to apply skills learned in training. Partial transfer

can be viewed as a percentage: number of skills transferred out of the number of total

skills taught. The last stages in the transfer process deal with the continued use of

what has been transferred. Conscious maintenance is the thoughtful and purposeful

continued application of skills over time. Prolonged application would lead to formed

habits: the unconscious continued application of behaviors (Foxon, 1993).

Significance

When Donald Kirkpatrick proposed his four levels of evaluation, he implied that

they were hierarchical. Theoretically, a positive reaction by a student to his/her

training would lead to higher course exam scores, and a student with a high exam

score would be likely to transfer the learning to another situation later at work.

Placing training into practice back on the job would then lead to tangible business

results such as a significant return on investment or increased cost performance.

Because the logic, chronology, and rationale of Kirkpatrick's hierarchy widely appeals

to training practitioners, it has been widely accepted. However, several researchers

have found little support for this hierarchical model (Alliger & Janak, 1989; Noe &

Schmitt, 1986; Santos & Stuart 2003). Santos and Stuart (2003) concluded that the

lack of evidence for the causal connections between Kirkpatrick's levels implied that

evaluations should be done at all of the levels because each evaluation provides a

different kind of evidence. Thus, Kirkpatrick's levels of evaluation can be best defined as a taxonomy or simple classification (Holton, 1996).

Marguerite Foxon's proposed transfer of training process also appeals to training professionals based on chronology and rationale.   For transfer of training to occur, learners must be motivated to initiate the skills they have learned. Some skills are never initiated. Other skills are initiated then fail and are discontinued while others are initiated and successfully adopted through continued concentration of the learner. As time passes, learners become so practiced that they achieve automaticity. Unlike Kirkpatrick's levels of evaluation, Foxon's transfer of training process has not been empirically supported or revised in the literature even though it is widely cited.

Methodology

This paper details a causal-comparative study to evaluate the transfer of training process experienced by the participants of a supervisor and management training program. The participants were municipal workers from the Houston and Oklahoma City metro areas. The training program examined in the study was developed and delivered by a vendor (Strategic Government Resource - SGR) who specializes in this type of training specific to municipalities. Training was conducted as a series of monthly classes – distributing the learning over the course of a year.   Data were collected using two survey instruments.   The instruments used in the study consisted of modified versions of other instruments that have been evaluated in the literature. Students were surveyed once at the end of each training session and once more 30 to 60 days afterwards.

The findings reported are intended to generalize to both wider populations and organizations. Structured supervisory skill training is conducted in many organizations across all industries. This training is commonly conducted by companies external to the organizations themselves. The vendor participating in this study and the training content delivered represents typical supervisory skill-based instruction.

Limitations

The study serves as an investigation of the effectiveness of a single training effort conducted for municipal employees participating in supervisor/manager development program. The assumption is that the participants are supervisory personnel who have similar need and opportunity to utilize this training on the job. Multiple training evaluations were used during this study in order to quantify the variables. These measures relied exclusively on self-reporting by the learners. The assumption is that the individuals who respond to the surveys are similar to those who do not. The design of the training program limits this study to investigate only the transfer of training; therefore, learning (level 2 evaluation) is not included as a variable. The assumption is that only learned skills can be transferred.

Another limitation of the study is in the exploratory factor analysis. One item failed to load onto any of the transfer of training variables. Another item was intended to measure maintained transfer but had stronger loading onto the intention to transfer variable. A pilot of the instrument was not possible prior to use in this study.

Terms and Definitions

There are a number of terms used throughout this paper. Some are used interchangeably. The following list is intended to serve as a reference and provide clarity.

- *Transfer of training* – This is prior learning that affects either performance or new learning. In this study, this term refers to a series of steps in a process.

- *Intention to transfer* – This is a stage in the transfer of training process. It characterizes the learner's motivation and expectation that transfer will occur.

- *Initiation of transfer* – This is a stage in the transfer of training process. It represents a single application of learning following a training event.

- *Maintained transfer* – This is the final stage in the transfer of training process. It is the ongoing application of learning following a training event.

- *Partial transfer* – This is a stage in the transfer of training process. Partial transfer is the term used to describe the percentage of training that is initiated and not maintained. It is often used interchangeably with *extent of transfer*. This study recommended altering the definition to describe partial intention to transfer and partial initiation of transfer.

- *Extent of transfer* – This is the author's term used to describe the percentage of training that is initiated and maintained. It is often used interchangeably with *partial transfer*.

- *Reaction to training* – This term summarizes the learner's opinion of the applicability, instructional design, and training delivery quality of the course.

- *Organizational support* – This term summarizes the learner's perception of supervisor support and peer support for the learner after training.

- *Reaction survey* – This is the first survey sent to the participants of a training class. It was emailed to the participants of a course the day the training was completed.

- *Follow-up survey* – This is the second survey sent to the participants of a training class. It was e-mailed to training participants 30 to 60 days after their course was completed.

Chapter 2: Literature Review

Defining Transfer of Training

Marini and Genereux (1995) define transfer of training as prior learning that affects either performance or new learning. Among scholars, there is very little disagreement with this definition because of its broad nature (Macaulay & Cree, 1999). However, there are concepts within this definition that are open to various interpretations. The definitions of learning (both prior and new), effects of learning, and performance have long fueled scholarly debate. A thorough definition of the topic requires a review of the historical development of transfer of training.

Transfer of training is the product of early 20th century behaviorism. Behaviorism is an objective branch of natural science that focuses entirely on the observable actions of organisms rather than internal consciousness (Watson, 1913). For a behaviorist, learning is defined as a relatively permanent change in behavior (Gagne, 1965). The vast majority of the literature on this topic starts with the work of experimental psychologists. In 1901, Thorndike and Woodworth published the Theory of Identical Elements. They theorized that if the stimuli, responses, and conditions in training matched the stimuli, responses, and conditions of the workplace, the learned behaviors would transfer. Simple and logical, this theory established the classical paradigm in which transfer of training is viewed. The Theory of Identical Elements established a training design standard by which later scholarship has been compared or contrasted.

The first major expansion beyond using identical elements for transfer of training came in 1908. Charles Judd found that teaching the general theoretical principles (or rules) associated with the skills trainees are asked to learn improves the transfer of training. For example, Judd (1908) found that teaching the properties of light and the way that light is refracted in water improved his students' skills in when attempting to shoot underwater targets. The addition of theoretical principles to a training design that was strictly a behavior-driven set of stimuli, responses, and conditions to improve transfer of training has been well supported by many other studies as well (Goldstein, 1986; Hendrichson & Schroeder, 1941; McGehee & Thayer, 1961). The addition of general principles to identical elements was the first of several valuable training design innovations.

In 1927, Thorndike added feedback as a critical component of the training design. He found that giving immediate feedback to learners as they practiced skills during training increased the likelihood that the skills would transfer (Thorndike, 1927). This study began an examination of the ways practice is incorporated into training design to maximize transfer.   The incorporation of overlearning into training practice was another significant step. Overlearning is the process of having students continue to practice skills during training beyond the acceptable level of success (McGehee & Thayer, 1961).   Studies have shown that overlearning increases student retention of the training content (Gagne & Foster, 1949; Schendel & Hagman; 1982). As research on feedback and overlearning greatly improved training design, they also signaled a shift in the focus of transfer of training related research toward the learner.

The initial studies dealing primarily with the learner in the training setting focused on the participant's abilities and aptitudes. McGehee (1948) found there was a relationship between early success in a training course and the transfer of training resulting from it. Specifically, when students demonstrated the ability to complete quickly the initial tasks of training, transfer was more likely. A student's aptitude for the course content was correlated with transfer of training by several researchers (McGehee, 1948; Taylor & Tajen, 1948). While the ability to grasp concepts quickly and put them into practice may be a predictor of training transfer, factors other than aptitude may influence students' abilities to grasp and transfer training.

Further studies focusing on the learner expanded quickly beyond aptitude and ability to incorporate motivation. Vroom's Expectancy Theory exemplifies this expansion. Vroom (1964, p. 17) stated that expectancy is "a momentary belief concerning the likelihood that a particular act will precede a particular outcome." He suggested that a worker's performance on the job primarily consisted of two personal factors: beliefs and ability (Vroom, 1964). Students leave training with different levels of motivation to transfer what they have learned. Part of that motivation is due to self perceptions of ability. For example, Ryman and Biersner (1975) found that self-confident trainees were more likely to successfully complete current and future training courses. Part of that motivation is due to their beliefs, values and expectations.

Goal-Setting Theory is another motivation theory that has strong ties to transfer of training. Edwin Locke (1968) stated there is a connection between one's

conscious intentions and goals and one's actions. He contended that a person's goals

and intentions must be included in any behavior (or task) oriented motivation theory.

Therefore, clear and well stated course goals or objectives can increase transfer of

training through not only sound instructional design practice but also because of the

increase in motivation (Locke, 1968; Locke, Shaw, Saari, & Latham, 1981; Mager,

1962).

Instructional design improvements to facilitate transfer of training were still

occurring during this time as well. The practice of using specific behavioral objectives

has long been a basic strategy used by trainers to effect change in students during

training that will transfer to other environments (Gagne, 1965). It is important,

therefore, that the objectives of the training match the performance setting to ensure

transfer. McGehee and Thayer (1961) emphasized the necessity of a training needs

analysis to insure that the objectives of training meet the knowledge, skill, and ability

deficits of trainees. When trainers have well stated behavioral goals from which to

start, various training methods can be employed to maximize training for transfer.

The methods used by trainers to incorporate practice into training became

better defined due to several research studies dealing with stimulus variability and

conditions of practice. Stimulus variability is the practice of using multiple and varying

stimuli during training (Duncan, 1958). Duncan (1958, p.70) found that "varied training

produced better transfer than constant training." Allowing students to practice

learned skills under a variety of settings produced better transfer than using one

example and engaging in overlearning types of practice (Shore & Sechrest, 1961).

Dividing practice into smaller and separate training sessions was also shown to improve transfer of training (Briggs & Naylor, 1962; Naylor & Briggs, 1963) especially for very complex tasks. The effective use of breaks can increase the prospects of long-term retention (Schmidt & Bjork, 1992). These breaks allow students to assimilate the information they have learned. If they are able to return to the workplace intermittently while taking the course, they have the opportunity to practice the skills, abilities, or knowledge they have just learned. Incorporating these practice conditions into a training design increases the connection between the setting of learning and the setting of transfer.

Transfer of training depends heavily upon the environment into which it is to be transferred (Eddy, Glad, & Wilkins, 1967). Some environments foster transfer of training more than others. Hand, Richards, and Slocum (1973) found that organizational appreciation of subordinate participation and of innovative behavior are two factors that facilitate transfer of training. Baumgartel, Reynolds, and Pathan (1984) found that organizations that value performance, innovation, open-mindedness, risk-taking, and reward programs for employees were more successful at facilitating transfer of training. The most important factor of the transfer environment, however, is probably the trainee's immediate supervisor. Management style and attitudes of supervisors have a very strong impact on whether or not the student transfers the knowledge and skill from training to the workplace (Binkerhoff & Montesino, 1995).

Classical transfer of training theory has evolved to be summarized by a great number of practices. Training for transfer should begin with a training design based upon a thorough training needs analysis that yields clear behavioral objectives. The learning environment should contain as many common elements with the transfer environment as possible. Students should be given varied practice beyond the normal level of successful demonstration of competence. Feedback should be given to students as they progress through their learning. Training for transfer should account for student characteristics. Aptitude levels, abilities, and motivation levels of students are all factors that affect transfer of training. Training for transfer should incorporate positive organizational factors. Managers should value, support, and reward the learning and practice of employees. Classical transfer of training is predominantly a behaviorist approach to learning. As transfer of training theory evolves, however, transfer has developed as a much more complex concept. The cognitive revolution signified a turning point for transfer of training theory (Lobato, 2006).

In 1986, Irwin L. Goldstein published a departure from the classical model of transfer of training. The Principles Theory of transfer focused on the underlying concepts and rules behind tasks to be transferred, not on the similarity of settings between the learning environment and the environment of transfer (Goldstein, 1986). Historically, Principles Theory is founded upon Harald Hoffding's (1892) argument in favor of psychological similarity rather than superficial similarity of setting and upon Judd's (1908) research highlighting the improved transfer of training when basic principles are added to practice. Under this theory, students are taught concepts and

principles they can use to deal with situations in the transfer environment not encountered in training (Kim & Lee, 2001).

Terminology was needed to classify the diverging theories of transfer. In 1990, Laker advocated that transfer should be classified as either near or far. The term *near transfer* reflects the classical view of training for transfer through identical elements. Near transfer occurs when there are a number of environmental similarities between the settings of learning and of transfer. The term 'far transfer' reflects the Principles Theory view of training for transfer through the understanding of principles and concepts. Far transfer occurs when the settings of training and learning are dissimilar (Laker, 1990). It occurs when a person applies previous learning to a problem they have neither previously been specifically trained to solve nor previously encountered. Because of the contrasting cognitive nature of far transfer, the near transfer training designs were not adequate to facilitate far transfer.

When far transfer of training is the goal, the training design must include features the classical design did not. Training should be designed to allow students the opportunity to discuss and apply training to situations they choose in order to facilitate transfer (Noe, 1986). The design should also encourage students to apply training to various situations different from that of the controlled classroom to facilitate transfer (Goldstein, 1986). Creative problem-solving examples and problem-based learning are also attractive for a far transfer of training design (Laker, 1990). Whether training for far or near transfer, it is clear that a thorough plan is needed.

Broad and Newstrom (1992) developed a model that would help organizations structure a transfer of training plan. This plan addressed not only trainer responsibilities and goals but also student and organizational (management) responsibilities and goals. These responsibilities and goals are divided into three time periods: before, during, and after training. Graphically, this creates a 3 X 3 matrix that can be used to organize for transfer of training. Once the matrix has been filled, it can also be used as a reference by each stakeholder to distinguish his/her responsibilities at any given time (Broad & Newstrom, 1992). However, the period of time right after a training event is the most crucial for transfer of training to occur (Tennenbaum & Yukl, 1992). Upon returning to their organizations, trainees must put into practice what they have learned or risk losing the skill or knowledge acquired from training.

Organizational climate is at least as important as the actual student learning in facilitating the transfer of training (Rouiller & Goldstein, 1993). Leadership should strive to create a transfer climate. Transfer climate is defined as "trainees' perceptions about a wide variety of characteristics of the work environment; these perceptions facilitate or inhibit use of trained skills or behavior" (Noe, 2005, p. 432). The organizational goal is to foster trainees' desire to merge the (newly) learned knowledge and/or skills into the performance of their job responsibilities (Noe & Schmitt, 1986). Rouiller and Goldstein (1993) presented the Transfer Climate Framework consisting of workplace cues to facilitate the transfer of training. Ultimately, the organizational leadership is responsible for giving the students and the trainers the resources needed for successful transfer to occur.

Holton (1996) proposed an evaluation model to measure the extent of successful training transfer. Three main factors are identified in the model as affecting a student's progression from learning to performance: transfer design, motivation to transfer, and transfer climate. Individual performance (moderated by these three factors) is the outcome of learning. Holton's model is an attempt to broadly summarize the key areas of research regarding transfer of training.

In 2005, a new model for transfer of training was presented. This model views transfer as a complex and dynamic phenomenon rather than a linear progression from learning situation to implementation (Lobato, 2006). At the foundation of this model is the following:

> …it is now time for learning theory to abandon transfer as an approach to how prior knowledge and experience contribute to learning. Transfer encourages educators and theorists to continue to view learning as a direct carrying over of procedures from one situation to another. When one looks carefully at people learning rich concepts, there is evidence that learners characteristically make adjustments in knowledge, that they attempt to reconcile conflicting interpretations, and they work with schematized understandings that stand at odds with a theory of transfer. (Carraher & Schliemann, 2002, p. 21)

Lobato and Siebert (2002) found that some learners can transfer the training that they receive only after generalizing previous knowledge and reconstructing their understanding of the relationship between the facts involved. In some cases, researchers have shown that learners will cognitively change the transfer situation

until it becomes similar enough for them to transfer what they have learned

(Bransford & Schwartz, 1999).

Marini and Genereux (1995) define transfer of training broadly as prior learning

that affects either performance or new learning. Druckman and Bjork (1994) reflect

the behaviorist definition of transfer: "the ultimate aim of training is procedural

learning, that is, for trainees to be competent in performing a job" (p. 147). Initial

competency should be the goal of any transfer of training to the work setting.

Enduring competency of the learner on the job provides greater returns for the

organization. Broad and Newstrom (1992) include this enduring competency in their

definition by defining the transfer of training as "the effective and continuing

application by trainees to their jobs, of the knowledge and skills gained in training" (p.

6). Cognitively, transfer "occurs when learning in one context or with one set of

materials impacts on performance in another context or with other related materials.

From a theoretical point of view, transfer of learning occurs whenever prior learned

knowledge and skills affect the way in which new knowledge and skills are learned and

performed" (Taylor, 2000, p.4). In this view, transfer can be "the incremental

refinement of knowledge resources that account for – rather than overlook –

contextual variation" (Wagner, 2006, p. 1). These varied definitions reflect the large

and diverse field of study regarding the way people use what they know.

Transfer of Training Theories

There are three theories used by researchers and practitioners to understand

and describe the design of training for transfer: Identical Elements Theory, Principles

Theory, and Cognitive Theory of Transfer (Noe, 2005). While a number of other theories have a strong influence upon training and its transfer to other settings (Motivation Theory, Organizational Theory, and Adult Learning Theory), these are the theories that are uniquely transfer oriented. A theory is defined as satisfying "two requirements: It must accurately describe a large class of observations on the basis of a model which contains only a few arbitrary elements, and it must make definite predictions about the results of future observations" (Hawking, 1996, p. 15). It is important to note that while these theories describe and predict phenomena, all have been challenged conceptually and empirically.

Identical Elements Theory

In 1901, Thorndike and Woodworth published the Theory of Identical Elements. They theorized that if the stimuli, responses, and conditions in training matched the stimuli, responses, and conditions of the workplace, the learned behaviors would transfer. Therefore, the success of transfer depends upon the number of similarities between the settings of training and of transfer. If the settings are perfectly identical, maximum transfer will occur. This theory reflects the classic behaviorist definition that learning results when one develops associations between stimuli and responses (Thorndike, 1913). Simple and logical, Identical Elements Theory established the classical paradigm in which transfer of training is viewed.

This theory provides a practical definition that explains the phenomenon of training transfer. Its assumptions and predictions have been extensively tested and supported by research for over 100 years (Ford & Weissbein, 1997), attesting to its

predictive power. However, Identical Elements Theory has also received a great deal of criticism.

By definition, the Identical Elements Theory fails to account for significant portions of training transfer. Transfer is movement from one place to another. For training, transfer means that learning from one setting is moved for application to another setting (Bransford, Brown, & Cocking, 2000). If all of the elements in one setting match identically with all of the elements in another setting, they are the same place. No transfer has occurred. The learning that occurs due to Identical Elements Theory can be infinitely replicated as long as the conditions under which learning is applied do not change. But, the whole idea of transfer is to take what has been learned and apply it somewhere else. When the settings and stimuli change, Identical Elements Theory is diminished in its effectiveness facilitating transfer.

Principles Theory

The Principles Theory of Transfer focuses on the underlying concepts and rules behind tasks to be transferred, not on the similarity of settings between the learning environment and the environment of transfer (Goldstein, 1986). Historically, Principles Theory is founded upon Hoffding's (1892) argument in favor of psychological similarity rather than superficial similarity of setting and upon Judd's (1908) research highlighting the improved transfer of training when basic principles are added to practice. Under this theory, students are taught concepts and principles they can use to deal with situations in the transfer environment not encountered in training (Kim &

Lee, 2001). In contrast to Identical Elements Theory, Principles Theory emphasizes the flexibility of transfer to various settings.

Practice in various settings is an important aspect of this theory. Judd (1908) found that teaching rules and principles did not immediately improve transfer. It was only after meaningful practice in varied situations that the performances of those taught general principles were elevated over those simply engaging in stimulus-response style practice.

This theory's assumptions and predictions have been extensively tested and supported through the research (Baldwin & Ford, 1988; Hendrickson & Schroeder, 1941; Judd, 1908). The Principles Theory gives trainers a much more flexible training design theory. Identical elements can be difficult to create in a classroom, whereas principles and concepts are much easier to incorporate. However, this theory has also received criticism.

Principles Theory assumes that knowledge can be separated from the context in which it was formed. It assumes that one's knowledge can be applied independent of the culture, social interactions, history, and context of the learning situation (Lobato, 2006). However, many people believe learning is a social phenomenon, and learning is constructed by students who are participants in dynamic social settings (Lave & Wenger, 1991). As a result, knowledge has been shown to be contextually based (Lave, 1988). "How tightly learning will be bound to context depends on the kind of knowledge being acquired" (Anderson, Reder, & Simon, 1996, p. 6), but there is still a connection between what is learned and the setting in which learning occurred.

By emphasizing rules instead of context and principles instead of social constructs, Principles Theory is diminished in its effectiveness facilitating transfer.

Cognitive Theory of Transfer

The Cognitive Theory of Transfer emerged out of the information process theories of learning that focus on the storage and retrieval of information (Noe, 2005). According to this theory, transfer of training is determined by the probability that one can retrieve prior learning relevant to the context of transfer (Royer, 1979). The theory assumes several things. First, it assumes memory is highly structured (analogous to a computer's memory) and can be searched in a systematic way. Second, it assumes some bits of stored memory have many interconnections with other bits (to continue with the computer analogy, these bits have many 'shortcut icons' in many other folders directing the searcher to the location of a bit) while other bits of memory have very few interconnections. Third, it assumes that comprehension of knowledge is necessary for transfer to occur (Royer, 1979).

Comprehension is necessary for transfer because of the retrieval aspect of the theory. For example, a person is faced with a problem they have neither previously been trained to solve nor previously encountered. To successfully deal with the problem, the person will have to search his/her brain in an attempt to retrieve a relevant piece of information that can be used in the current circumstance. Relevance is the key to this example. The relevance of memory to a situation can only be determined when the memory is comprehended. Memories that lack comprehension

are, likely, not going to present themselves to the searcher as a possible solution (Royer, 1979).

There are significant benefits associated with the Cognitive Theory of Transfer. It views transfer as a complex and dynamic phenomenon rather than a linear progression from learning situation to implementation (Lobato, 2006). Because all of one's comprehended knowledge can be searched and brought to bear on a problem, interconnectivity of memory is the key to transfer. Emphasis is placed on connecting new learning with as many other pieces of existing knowledge as possible. In practice, this causes the learner to engage in an incremental refinement of knowledge accounting for both the old and new contexts of learning (Wagner, 2006). Novel applications of unique combinations of knowledge retrieved by learners can then be transferred to multiple contexts (Royer, 1979). Therefore, this theory can be used to facilitate either near or far transfer (Noe, 2005).

While the Cognitive Theory of Transfer is criticized, like Principles Theory, for the assumption that knowledge can be separated from the context in which it was formed, there are other criticisms as well. The theory adds very little to near transfer that has not already been established by the Identical Principles Theory (Royer, 1979). Other criticisms are based on the theory's assumptions. The theory assumes that one's memory is an organized, discrete, and static structure. This assumption has mixed support in the literature (Merriam & Caffarella, 1999; Sylwester, 1995). The assumption that comprehension is necessary for transfer is contradicted by the

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Identical Elements Theory. Learners do not need to comprehend training in order for transfer to occur (Royer, 1979).

In conclusion, a number of theories have a strong influence upon training and its transfer to other settings. One could include any number of philosophical paradigms, learning theories, motivation theories, or organizational theories. Essentially, any theory explaining a way people think, learn, or act can influence what one transfers from one setting to another. Identical Elements Theory, Principles Theory, and Cognitive Theory of Transfer are the theories having implications specifically for training for transfer (Noe, 2005).

Factors Influencing Transfer

Current transfer of training literature focuses primarily upon three main factors that influence practice: transfer climate, learner characteristics, and training design. Training practitioners focus on these key areas when implementing training to maximize transfer (Broad & Newstrom, 1992; Holton, 1996). From the early design stages to the last stages where the student is transferring (or not) what they have learned to the workplace, each of these three factors is critical to the transfer process.

Transfer Climate

In Kirkpatrick's hierarchy, the transfer of training is the level of evaluation situated between a test or examination of the objectives of a specific training event and the big picture evaluation of the attainment of organizational goals over time. This makes organizational climate at least as important as the actual student learning in facilitating the transfer of training (Rouiller & Goldstein, 1993). Within

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organizational climate, there are a number of contributing variables. Organizational

structure, leadership styles, knowledge management and communication styles

directly affect the transfer of training. These variables can often be difficult to quantify

and rank against the direct effects of a training event.

Leadership within the organization should strive to create a transfer climate.

Transfer climate is defined as "trainees' perceptions about a wide variety of

characteristics of the work environment; these perceptions facilitate or inhibit use of

trained skills or behavior" (Noe, 2005, p. 432). The organizational goal is to foster

trainees' desire to merge the (newly) learned knowledge and/or skills into the

performance of their job responsibilities (Noe & Schmitt, 1986). Ultimately, the

organizational leadership is responsible for giving the students and the trainers the

resources needed for transfer to occur.

Supervisor support. Supervisors have a very influential role in the transfer of

training process (Broad & Newstrom, 1992). Simple conversations about the training

an employee has received and how learned skills may apply to the job can have a

significant effect on transfer (Lim & Johnson, 2002). Active supervisor engagement in

training (such as participating in at least part of the employee's training course) has

also shown increases in employee transfer of training (McSherry & Taylor, 1994). One-

on-one coaching by the supervisor reinforcing training content helps as well (Broad &

Newstrom, 1992).

Peer support. As important as supervisor support is to facilitating transfer of

training, some have posited that the support of peers provides a more consistent boon

to transfer of training than supervisors (Facteau, Dobbins, Russell, Ladd, and Kudisch, 1995). Peers have been shown to have a significant effect on both pre-training motivation and post-training transfer. Chiaburu and Marinova (2005) found that peers have a significant effect on pre-training motivation (which has been demonstrated to increase transfer of training). Hawley and Barnard (2005) found that transfer of training improved when peer networking and support groups were employed to communicate and share ideas regarding courses attended.

Opportunity to perform. Limited opportunity to perform the skills learned in training is the biggest barrier to successful transfer (Clarke, 2002). Students must be able to use what they have learned in class, or they risk losing it. Employers can facilitate transfer of training by developing a plan that allows workers to perform tasks related to the recently completed training (Clarke, 2002). This kind of planning can be used not only to give employees the opportunity to practice but also to introduce accountability for practicing. Transfer of training increases significantly when post-training accountability mechanisms are utilized (Longnecker, 2004).

Student Characteristics

Some students learn, retain, and transfer better than others. It is important for the training practitioner to factor personal characteristics into the training strategy in order to maximize the transfer potential for each student. Fortunately, there are a number of learner characteristics that have been demonstrated in the research literature to predict higher levels of transfer.

Intelligence. A student's aptitude for the course content has long been correlated with transfer of training (McGehee, 1948; Taylor & Tajen, 1948). "One of the most common and supportable findings in educational research is that far transfer is achieved by students with higher general ability scores" (Clark & Voogel, 1985, p. 120). There are many different ways educators attempt to quantify intelligence, but perhaps the best predictor of training success is general intelligence (Ree & Earles, 1991). Unfortunately, trainers cannot set the intelligence levels of students. Trainers should, however, take into consideration important characteristics about the intended audience when attempting to provide the most effective training possible (Merriam & Caffarella, 1999).

Motivation. Several different kinds of motivation have been found to correlate with transfer of training. Student motivation to transfer training can be divided into three time periods: before, during, and after training (Broad & Newstrom, 1992). *Training motivation* is the term that has been used to describe the learner's overall intensity and persistence through these three time periods in the training process (Tannenbaum & Yukl, 1992). And, motivation can consist of both intrinsic (self-motivation) and extrinsic (external pressures) components (Knowles, 1990).

Pre-training motivation (a student's level of drive prior to training) has been found to significantly correlate with transfer of training (Facteau, Dobbins, Russell, Ladd, and Kudisch, 1995). Early motivation can be the result of a number of things. Hicks and Klimoski (1987) found that if learners perceived they were given the choice to attend or not attend training then their motivation to learn was higher (as was the

likelihood of transfer of training).   This study reflects an intrinsic motivator at work.

Other studies have confirmed that intrinsic motivation has a greater effect on pre-training motivation and subsequent transfer than extrinsic motivators (Facteau, Dobbins, Russell, Ladd, & Kudisch, 1995; Kontoghiorghes, 2001). As an example of intrinsic motivation, learner self-efficacy (a student's belief prior to training that he/she can do well) for a particular subject area has been shown to predict motivation and transfer (Chiaburu & Marinova, 2005; Machin & Fogarty, 2004). In contrast, anxiety (stress due to the content, methods, or setting of a future training event) is the type of emotion that can de-motivate students and act as a barrier to transfer which is why many practitioners have designed pre-training interventions attempting to mitigate negative motivation that will affect students during training (Broad & Newstrom, 1992).

Motivation during training is primarily a result of the learner's experience with the course materials. Early successes in training have correlated with higher motivation (Gordon & Cohen, 1973). For example, McGehee (1948) found there was a relationship between early success in a training course and the transfer of training resulting from it. Specifically, when students demonstrated the ability to complete quickly the initial tasks of training, transfer was more likely. Intervention fulfillment, "the extent to which training meets or fulfills training expectations and desires" (Yamnill & McLean, 2001, p. 200), also acts as a motivator for students as they experience a training course. Students who believe that what they are learning during

training is valuable are more likely to be motivated to both learn and to transfer the material after training (Baumgartel, Reynolds, & Pathan, 1984; Knowles, 1990).

Motivation to transfer training after a course can be a function of trainee reactions to a course, organizational commitment (Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991), and perceived rewards (Porter & Lawler, 1968). In general, trainees who like the course they have attended are more likely to transfer what they have learned (Tannenbaum et al., 1991). The extent to which trainees identify with their jobs and perceive their belongingness within an organization have also been linked with post-training motivation to transfer (Noe & Schmitt, 1986; Tannenbaum et al., 1991). Post-training motivation is also affected by perceived rewards such as career advancement and other rewards they value (Kontoghiorghes, 2002; Porter & Lawler, 1968). It is clear that the organization is a significant part of an employee's propensity to transfer training.

Design

Courses must be designed with the intention that the training will transfer. In fact, many experts think lack of an appropriate training design is a main contributor to the lack of transfer (Broad & Newstrom, 1992; Holton, 1996; Perkins & Salomon, 1988; Yamnill & McLean, 2001). Several design factors have been demonstrated in the research literature to predict higher levels of transfer.

Needs analysis. Caffarella (2002) emphasized the necessity of a process (formal or informal) to ascertain what training needs to accomplish. A training program for adult learners is best used when there is a knowledge or skill gap in performance

(Burke & Hutchins, 2007). A common mistake organizations make is implementing a

training program to address a problem that is not knowledge or skill related (Noe,

2005). For example, employees in an office setting are dressing inappropriately. Each

is aware of the dress code, and each chooses not to adhere. In this situation, there is a

performance gap between *what is* and *what should be*, but the gap is not due to a lack

of knowledge about the rules and not due to the lack of the employees' skills dressing

themselves. Designing a training program to fix this problem (that is obviously a

discipline problem) will most likely suffer a very low rate of transfer (Noe, 2005).

Identifying an appropriate training opportunity is extremely important to ensure

transfer of training. Once a training opportunity has been identified, the specific

nature and extent of the knowledge and skill gap in performance can be used to

establish training goals.

   Behavioral objectives. Once the need for training has been established,

measurable criteria are set. Learning objectives should explicitly state the desired

performance, the conditions of performance, and acceptable criteria of performance

(Mager, 1997). This strategy of developing and communicating the specific objectives

of training to the participants to improve transfer of training has been well supported

in the literature (Kontoghiorghes, 2001; Locke, Shaw, Saari, & Latham, 1981; Wexley &

Baldwin, 1986). Stating well-structured objectives not only helps instructors elicit

desired behaviors from students (Gagne, 1965), but it also establishes a performance

goal for the student. Edwin Locke (1968) stated that there is a connection between

one's goals and one's actions. Therefore, clear and well stated course goals or

objectives can increase transfer of training through not only sound instructional design

practice but also because of the increase in motivation (Locke, 1968; Locke, Shaw,

Saari, & Latham, 1981; Mager, 1962). Practitioners must ensure, however, that the

learning goals (and the training materials used to meet those goals) are closely related

to the transfer task (Bates, 2003).

Course introduction and overview. The initial learner contact with the

instructional media can have a significant effect on training outcomes. Initial contact

can take many forms: e-mail notifications, flyers, web publications, periodical

announcements, or verbal instructions (Davidson-Shivers & Rasmussen, 2006). The

introduction makes clear to the learner the method of enrollment, the initiation of the

training module, and the criteria for completion of delivery.   The initiation of the

training module should include instructions so that learners understand the structure

and organization of learning within the course. These communications should

overview the program content and set expectations of the student: prerequisite

knowledge and skills (Sims, Dobbs, & Hand, 2002).

Course technology. The advance of technology makes available to training

designers an expanding number of accessible tools for authoring and delivering

training. At the heart of the importance of the use of technology to deliver training is

the learner's interaction with it. These tools have allowed instructional designers to

build courses with interfaces between the user and instruction which are increasingly

both simple and usable as well as engaging and interactive. The user interface is the

total of the information displayed to the learner: text, graphical elements, audio and

visual media. Ideally, the interface should be built so that a "learner doesn't even notice it" (Davidson-Shivers & Rasmussen, p. 253). Instructional designers often choose instructional technology based upon their perception that students will be able to easily use it to meet the training objectives (Johnson, 2004).

Content. If training is to transfer, there must be a connection between the setting of learning and the setting of practice. For the behaviorist, this means that if the stimuli, responses, and conditions in training match the stimuli, responses, and conditions of the workplace, the learned behaviors will transfer (Thorndike & Woodworth, 1901). For the cognitivist, this means that if training can establish the rules and principles applicable to various transfer settings and students are able to retrieve knowledge applicable to their situation, learning will transfer (Goldstein, 1986; Kim & Lee, 2001). Both behaviorist and cognitivist strategies have been supported in the literature to facilitate transfer of training (Duncan & Underwood, 1953; Rodriquez & Gregory, 2005; Underwood, 1951), but the common thread through both is that learners must see the relevance of the content's applicability for transfer (Noe, 2005; Yamnill & McLean, 2005).

Practice incorporated into the course content can be used to establish the connection with the setting of transfer. Students should be provided work-related practice exercises (Howard, 2000). Clear and complete procedural examples from the workplace accompanied by the required actions of workers can increase transfer – particularly when the examples include opportunities for interaction and feedback (Kalyuga, Chandler, Touvinen, & Sweller, 2001). Feedback is information given to

students to let them know how their performance is progressing, and it has been well documented in the literature that feedback given to students during classroom practice increases transfer of training (Kalyuga, Chandler, Touvinen, & Sweller, 2001; Thorndike, 1927; Wexley & Thornton, 1972). The connection between the classroom and the transfer environment can be strengthened by the types of practice used, but other practice strategies have been demonstrated to promote transfer of training as well.

Varying the stimuli during class will also improve transfer of training. Incorporating a variety of practice examples has been found to be more effective than using one example repeatedly (Shore & Sechrest, 1961). Repetition, however, is a strategy that has been linked with transfer of training. In this context, repetition is often referred to as overlearning. Overlearning is the process of having students continue to practice skills during training beyond the acceptable level of success (McGehee & Thayer, 1961). Studies have shown that overlearning increases student retention and transfer of the training content (Fisk & Hodge, 1992).

Additional practice strategies can also be incorporated to improve transfer of training beyond what simple repetition can accomplish. Allowing students to rest between practices by spacing the sessions has been shown to increase transfer of training (Donovan & Radosevich, 1999; Reynolds & Bilodeau, 1952). While spaced training is superior to massed training, the distinction between the benefits of whole task training (teaching and practicing an entire task from start to finish) and part task training (teaching and practicing separate parts of a task while building toward the

whole) are not as differentiated (Noe, 2005). Noe (2005) has suggested that incorporating both strategies during training would be most effective.

The types of problems used during practice can also affect transfer. The traditional method of assigning a problem to a student and having them solve it has been demonstrated to be less effective than either worked or completion problems (Paas, 1992). A completion problem is a practice condition in which the student is given a problem with a partially worked solution and the student is required to complete the solution. This type of problem-solving practice has been linked with higher far transfer rates than traditional problem-solving (Paas, 1992). A worked problem is a practice condition that requires a student to evaluate an already solved problem. Because evaluation is the highest level of cognition (Borich, 1996), it is not surprising that worked problems lead to higher levels of both near and far transfer (Paas, 1992).

Resources and materials. To be effective, the content and instructional materials must have sufficient depth and be comprehensive to the tasks and behaviors being taught (Davidson-Shivers & Rasmussen, 2006; Sims, Dobbs, & Hand, 2002). The content resources and materials also have to be appropriate for the delivery method selected (Zhang, 2005). The technology utilized factors here as well. When building courseware, the technology is used in a purposeful way to organize and integrate the graphics, audio, video, external hyperlinks, job aids, and references (Davidson-Shivers & Rasmussen, 2006). To quote Moore (1973, p. 671), "…the events of teaching in independent learning and teaching situations must be especially carefully contrived.

Since they are to be communicated by non-human devices, programs must be carefully prepared, with the teachers' aims and intentions unambiguously stated, and the target population clearly defined, materials well-devised, well-illustrated, and appropriately paced."

Interaction. Interaction in training generally takes one of three forms: student-content, student-student, and student-instructor (Moore, 1973). Many studies have indicated that increased student-student interaction increases student satisfaction (Swan 2001; Jeong, 2003). However, some have found that this interaction is not required. When one of the other forms of interaction is strong or when students perceive themselves as independent or autonomous, the lack of student interaction does not affect satisfaction (Kamarae, 2003; May 1993; Swan 2001). Interaction between the learner and content can be achieved through the use of several mechanisms. Assessments, both formative and summative, serve as an opportunity for the student to interact with the content. Opportunities for practice of the content can be used to not only increase the likelihood of training transfer but also to foster interaction between the student and the material (Nelson, 2000). Utilizing the technology available to vary the mechanisms of interaction (e.g. polling, games, and simulations) can increase student engagement (Davidson-Shivers & Rasmussen, 2006).

Learner support. Adult learning theory has caused us to develop the concept of the *autonomous learner*: one who "is compelled to accept a comparatively high degree of responsibility for the conduct of his learning program" (Moore, 1973, p. 666). This additional onus on the learner requires a higher degree of initiative to find and access

more information when needed. In turn, instruction designers have a higher

responsibility to insure that the course instructions clearly provide the learner with

information regarding the institutional support available. Additional support could

take the forms of electronic performance support, help desk support, instructor

questions and answers, reference materials, or technical support (Davidson-Shivers &

Rasmussen, 2006). The importance of the concept of learner support is that the

learners perceive a connection with the instruction, peers, or institution. The degree

to which a student perceives the availability of support has been shown to be a strong

predictor of post-training learning outcomes (Shin, 2002).

Transfer of training plan. The period of time right after a training event is the

most crucial for transfer of training to occur (Tennenbaum & Yukl, 1992). Trainees

must put into practice what they have learned or risk losing the skill or knowledge

acquired from training. Planned post-training interventions can have a significant

effect on transfer of training and the maintenance of permanent behavioral change

(Wexley & Baldwin, 1986). Participants should be given resources to reference (and

opportunities to do so) when they return to the job. These can take the form of a

web-site where they could share ideas and practice drills or a CD-ROM which contains

additional practice (Boyd, 2002). Many services can be offered with the use of an

organizational intranet, for example. These services can include advisement,

counseling, materials and textbooks, test materials, exam preparation, and proctoring

(if applicable) (Gellman-Danley & Fetzmer, 1998). Not all of these support services are

applicable to all organizations or training situations, but it is important to note that there are many post-training design options for improving transfer of training.

The Relapse Prevention Model is one example of an intervention strategy that has been hypothesized to maintain behavioral change following training (Burke & Baldwin, 1999). The goal is to prevent the learner from relapsing back to a pre-training set of behaviors (Marx, 1982). To do this, the learner is taught to "understand and cope with the problem of relapse. Identifying the determinants of a treatment's failure is seen as the key to maintaining behavior. The model predicts that anticipating future failures and monitoring past and present ones will enhance long-term behavioral change" (Wexley & Baldwin, 1986, p. 505). Regardless of which strategy one uses to enhance transfer, the general idea is important: training should be designed to support the student even after the course has ended.

Assessment and measurement. A number of assessment and measurement factors have been identified as improving the effectiveness of learning outcomes (Davidson-Shivers & Rasmussen, 2006). Macdonald and Twining (2002) found that one of the most important factors is the integration between the task and the assessment instrument. Assessments which closely match the tasks and behaviors learned are crucial for providing feedback, recognizing student achievement, and focusing students to the objectives. Choosing an assessment that (a) matches the task and (b) is appropriate for one's learning format applies to both formative and summative evaluations (Macdonald & Twining, 2002; Nelson, 2000). In addition to these benefits of assessment, integrating self-check assessments through the delivery of the training

should require students to interact with the content within the context of the media

with the aims of (a) increasing interaction between the student and training and (b)

increasing the student's usage of the resources and materials reference in the training

(Davidson-Shivers & Rasmussen, 2006).

Evaluation

Post-training measurement of transfer can take one of three basic forms. The

easiest way to measure training transfer is to simply ask the learner. Learner self-

reporting can be problematic. Essentially, there is not a sufficiently tested, reliable

instrument that can be used across various disciplines to quantify transfer of training

(Holton, Bates, Seyler, & Carvalho, 1997). Also, there is some indication that

participant self-reports may not be accurate for the dimensions measured (Terborg,

Howard, & Maxwell, 1980). The second way to measure transfer of training is to ask

the supervisors, peers, or employees of course participants. The supervisor, in

particular, is in an excellent position to evaluate whether or not behaviors have

changed after training (Garavaglia, 1993). The final method involves evaluating work

product. This type of evaluation requires that observation criteria be set, and students

are then measured against the criteria. This method is especially effective for

repetitive tasks (Garavaglia, 1993).

Evaluating the attainment of learning objectives and getting participant

feedback at the conclusion of a course are two evaluations that can be conducted

immediately (Boyd, 2002). However, since the transfer of training is "the effective and

continuing application by trainees to their jobs, of the knowledge and skills gained in

training…" (Broad & Newstrom, 1992, p. 6), evaluation must be done over time to ensure that the training is actually transferred to the job. Measuring transfer of training can be very difficult as training practitioner control over measurement diminishes with time and variables affecting transfer increase over time as illustrated in Figure 2. Specifically, there is a continuing problem of instrumentation to measure transfer of training (Ford & Weissein, 1997). Fortunately, recent contributions to the literature have introduced a variety of ways to quantifiably operationalize the transfer of training through the use of a survey.

Figure 2. Measurement of the Transfer of Training
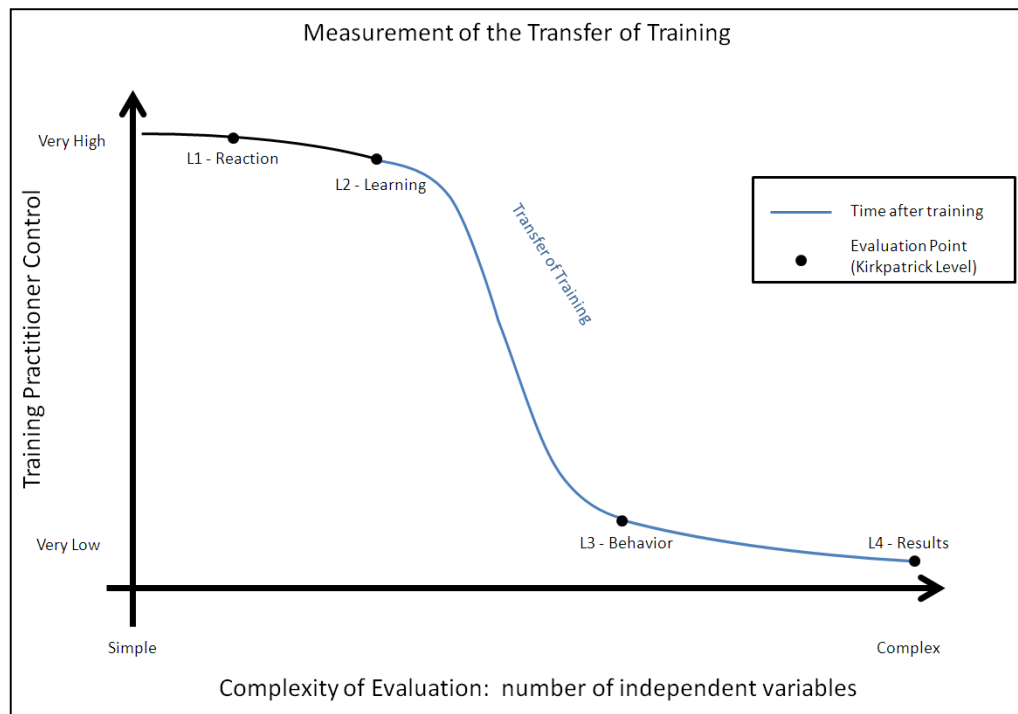
(Lim & Nowell, 2013)

Construct validity is critical when selecting a transfer of training survey instrument. Performing a factor analysis to identify the instrument's specific constructs is a critical part of the instrument validation process (Holton, Bates,

Bookter, & Yamkovenko, 2007). The researcher examined three factor analysis studies

examining the construct validity of three survey instruments used to quantify the

transfer of training. Each instrument was designed to measure slightly different

opportunities for training transfer. Warr and Bunce (1995) tested an instrument that

measured specific trainee characteristics like emotional reactions to training as well as

transfer of training.   Tracey, Tannenbaum, and Kavanagh (1995) tested instruments

that measured transfer of training climate and continuous learning culture. Both of

these instruments were developed for specific applications to those researchers' fields

of study. However, Holton (2007) developed and tested a transfer of training

instrument that can be applied across a variety of fields. It was this type of instrument

that could be most effectively used for this study.

  The Learning Transfer Systems Inventory (LTSI). In a fairly recent study, Holton,

Bates, and Ruona attempted to validate a generalized transfer of training system

inventory (LTSI).   The validation study consisted of the researchers (a) identifying

constructs to operationalize, (b) developing a measurement tool, and (c) surveying a

heterogeneous mix of 1,616 people upon the completion of a training program.

Exploratory factor analysis was performed on the instrument. The results yielded 16

factors that matched closely the researchers' hypotheses. Reliability was also high for

the factors. The factor loadings were examined, and the instrument was trimmed to

exclude the non-loading questions (Holton, Bates, & Ruona, 2000). The significance of

this study was the attempt to validate a transfer of training instrument that could be

used for either program specific or general transfer of training measurement.

The LTSI was chosen to inform the instrument used in this study for a number of reasons. It can be used to measure key constructs in this study: intention to transfer and learner support. The instrument has been adequately reliable with Cronbach's Alpha measured from .81 to .93 for the motivation and support constructs (Bates & Holton, 2004). Finally, the validity of the LTSI has been investigated extensively in multiple organizational settings and multiple cultures (Holton, Bates, Bookter, & Yamkovenko, 2007). Several of these studies have concluded significant support for the construct validity as well as convergent and divergent validity of the instrument through extensive study of the interconnection of this instrument to others used in social science research (Bates, Holton, Seyler, & Carvalho, 2000; Holton, Bates, & Ruona, 2000; Holton, Bates, Bookter, & Yamkovenko, 2007).

The Training Satisfaction Rating Scale (TSRS). In 2006, a group of researchers from the University of Seville's Training Center for Administrative and Service Personnel developed and tested a training satisfaction survey instrument in line with Kirkpatrick's level 1 evaluation (Tello, Moscoso, Garcia, & Chaves, 2006). The initial items were identified by surveying other universities' instruments to identify and group items. Through pilot studies, the researchers narrowed the number of items from seventy two (72) to twelve (12) measured on a five-point Likert-type scale. They surveyed 2,746 for the validation study in which the researchers identified three dimensions for measurement: objectives and content; method and training context; and usefulness and overall rating. It is the method and training context dimension which is of particular concern for this study.

The TSRS was also chosen to inform the instrument used in this study because of the applicable constructs measured, the reliability of the instrument, and the validation process through which it has gone. The majority of the items in this instrument measure the student's reaction to the method and context of training (which make it ideal for use in this study). In their 2006 study, Tello proposed a 12-item rating scale after evaluating 72 potential items through a content validity study which incorporated the use of exploratory factor analysis, expert judges, and confirmatory factor analysis. The reliability of their final instrument had a Cronbach's Alpha coefficient of .89.

Model Evaluation. The research questions posed for this study in Chapter 1 are expanded into multiple research hypotheses in Chapter 3. These hypotheses were made based upon the contents of the literature review in this chapter as they related to the model proposed by Marguerite Foxon. From the literature review, the model illustrated in Figure 3 summarized the basis for hypothesis development. The subsequent testing of the hypotheses either confirmed the current relationships or led to revised relational paths.

Figure 3. Theoretical Model Informing the Transfer of Training Process Hypotheses
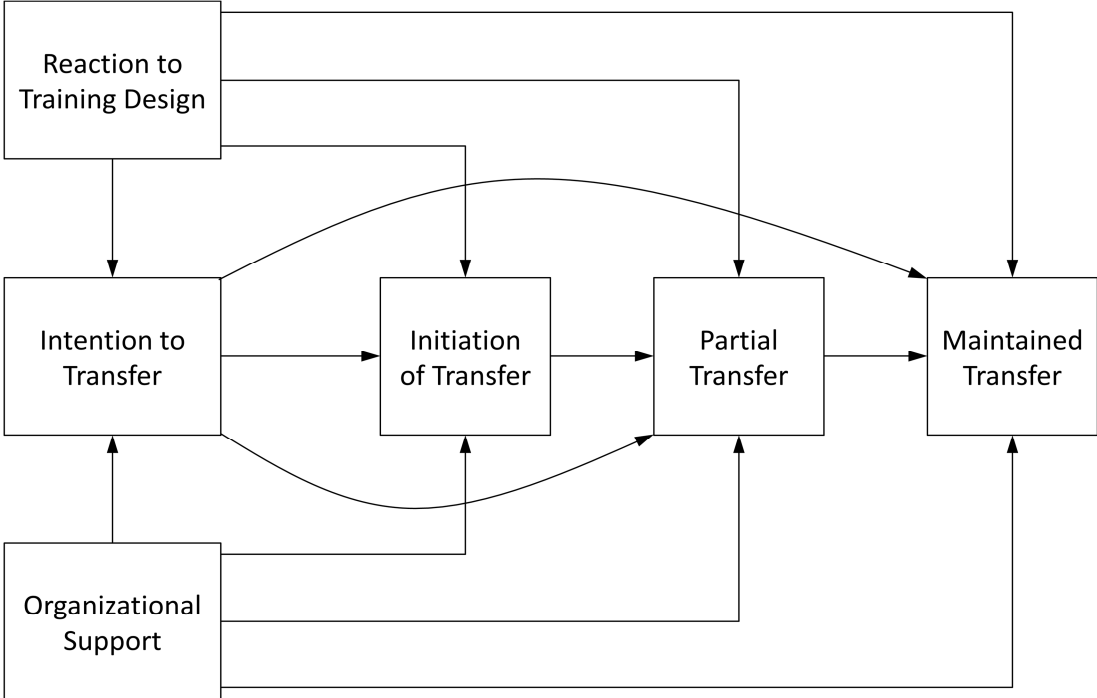
(Adapted from Baldwin & Ford, 1988; Foxon, 1993; Holton, 1996;)

Chapter 3: Methods

The primary purpose of this study was to test Foxon's model of the transfer of training process. The research for this study was conducted through the use of a causal-comparative design. A survey instrument was used to operationalize each stage of the transfer of training process as well as the common factors associated with transfer climate, learner characteristics, and training design referenced in the previous chapter. This study tested the relationships among and between these factors for learners.

This chapter details the research questions and hypotheses, study population, research design, instrumentation, and data analysis. Analysis of the data included regression analysis, stepwise regression analysis, path analyses, and mediation analysis. Descriptive statistics collected will be calculated and presented. The research hypotheses were tested with alpha set at .05.

Research Questions and Hypotheses

This research was conducted to evaluate a model for the transfer of training process. There are three primary research questions addressed in this study. Within each question, a number of individual hypotheses have been posited and tested.

Research Question 1. What is the relationship between each stage of Foxon's Transfer of Training Process?

H_1 Intention to transfer, initiation of transfer, extent of transfer, and maintenance of transfer are all correlated.

H_2 High intention to transfer will predict high initiation of transfer.

H_3 High initiation of transfer will predict extensive transfer (partial transfer

will be higher).

H_4 High extent of transfer will predict high maintenance of transfer.

H_5 Intention to transfer will mediate the relationships between the

initiation of transfer, partial transfer, and maintenance of transfer

variables.

Research Question 2. What is the relationship between a learner's reaction to

training, perceived organizational support of the training, and intention to transfer the

training?

H_6 Reaction to training will predict intention to transfer training.

H_7 Organizational support of the training will predict intention to transfer

training.

H_8 Organizational support of the training will mediate the interaction

between the learner's reaction to training and their intention to

transfer.

Research Question 3. What is the relationship between a learner's reaction to

training, experienced organizational support, and each stage of Foxon's Transfer of

Training Process?

H_9 Reaction to training will predict the initiation of training transfer.

H_{10} Reaction to training will predict the extent of training transferred.

H_{11} Reaction to training will predict the maintained transfer of training.

H_{12} Organizational Support will predict the initiation of training transfer.

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H_{13} Organizational Support will predict the extent of training transferred.

H_{14} Organizational Support will predict the maintained transfer of training.

H_{15} Reaction to Training and Organizational Support will mediate the

relationship between motivation to transfer and initiation of transfer.

H_{16} Reaction to Training and Organizational Support will mediate the

relationship between initiation of transfer and the extent of transfer.

H_{17} Reaction to Training and Organizational Support will mediate the

relationship between extent of transfer and maintained transfer.

Manager and Supervisor Training

Within the Human Resources Development (HRD) field, supervisory skill

training programs are common. Most large organizations have formal training to

prepare new and current supervisors for the challenges of having employees reporting

to them (Noe, 2005). These programs share a number of common learning objectives

in the United States due to the nature of employment laws, common competition for

talented employees, and the availability of research data indicating the typical training

needs of the supervisor or manager role. As such, typical training topics include

effective communication skills, emotional intelligence, managing a budget, diversity in

the workplace, interviewing/hiring practices, project management, managing

relationships, coaching, accountability, delegation, employee compensation, and

change management.

Supervisor Training was chosen as the topic of this transfer of training study for

three reasons: commonality of the topics taught, ubiquity of the programs, and the

instructional design and delivery consistency available. Because this training is needed

by so many people, organizations have the choice of developing internal programs or

partnering with one of many outside vendors to provide training. The choice of

internal development and delivery versus external development and delivery is most

often made by weighing three major factors: training cost, course instructional design

quality, and instructor competence (Noe, 2005).

There are many vendors offering supervisory training to organizations. The

most successful of vendors deliver training with high levels of instructional design and

instructor quality at competitive costs. The vendor delivery option also offers a

significant advantage for this study on transfer of training: varied organizational

climates. Successful vendors deliver training to a number of organizations. The

differences between those organizations added clarity to several of the variable

relationships noted in the next chapter.

Strategic Government Resources

Strategic Government Resources (SGR) was selected to participate in this study

because they offer high quality manager and supervisor training to many different

organizations. SGR specializes in developing and delivering manager and supervisor

training to local governments. It is the largest private sector provider of instructor-led

training for local government employees in the United States. In 2013, SGR had over

300 local government clients in 40 states.

Strategic Government Resources agreed to participate in this study because

they had not measured the transfer of training previously. Similar to most

organizations (ASTD, 2006), SGR has only evaluated programs at Kirkpatrick's first level. As a result of budget constraints for local governments, SGR has been proactively seeking additional data to (a) evidence the value of their current training programs to customers or (b) indicate points of improvement for internal re-development or delivery.

The company offers supervisor and manager training as a program delivered one day a month at each participating organization's location. Each session length is either a full or half day. At the conclusion of the 18 month series, the students attending all sessions get a certificate of completion.

Participants

To recruit participants, SGR approached each of their participating organizations in Oklahoma and Texas to gauge interests in the study. Five organizations agreed to participate, and the HR Directors from each of those organizations submitted signed permissions to contact individual course participants to recruit volunteers for the study. The findings of this research were reported to participating organizations at the conclusion of the study.

All of the participants in the study were attendees of SGR's training courses from one of the five participating organizations. All participants were municipal workers (e.g. librarians, building inspectors, clerks, investigators, fire fighters, police officers, maintenance and utility workers, etc.) who served as team leaders, supervisors, or managers. In some cases, attendance in the training was required by the individual employers, and in some cases, participation was voluntary. Specific

demographic information regarding title, age, education, and experience for the participants was obtained on the end-of-training evaluation and will be reported in the next chapter.

Participants were approached to participate in the study via e-mail. At the end of the training class, the participant roster (containing the participant's e-mail address) was used to generate a standard message to each participant asking him/her to complete a survey. The email included a link to a SurveyMonkey site where the information sheet disclosed the details of the study. Volunteers then completed the survey.

Institutional Review Board

The University of Oklahoma Institutional Review Board (IRB) examined this study for ethical considerations and risk to participants. The IRB determined that this study was exempt from review. This determination was based on their findings:

- Participants were not compelled by the research to participate in the training.

- The surveys were typical end-of-course questionnaires.

- Participation in the survey was optional.

- Participants completed the surveys anonymously.

- The researcher had no access to the identities of the participants.

- The training vendor had no access to the research data.

- The training vendor and training sites gave written permission for data collection.

- The participants were given a research information sheet prior to completing the survey.

The IRB response is located in Appendix 1.

Instrument

A survey instrument incorporating a Likert-type scale was used for primary data collection. The instrument was adapted slightly to be administered twice: once at the end of training and once at least thirty (30) days after the completion of training. The survey was administered through SurveyMonkey where the responses and raw data were initially collected.

The instrument was compiled/edited by the researcher. The content of this instrument was developed based on two sources. The sources are established instruments currently being used to evaluate training: the Learning Transfer Systems Inventory (LTSI) and the Training Satisfaction Rating Scale (TSRS). The instrument items used to measure intention to transfer, organizational support variables, and the overall transfer of training were inspired by the *Learning Transfer System Inventory* (LTSI) questionnaire. Actual items from that instrument could not be used because the LTSI asks general questions about organizational support and transfer of training. The items used in this study focused on an immediate training event. The items used to measure the student's attitudes toward delivery, applicability of the content, reaction to the training, and participant demographics were adapted from the *Training Satisfaction Rating Scale* (TSRS)*. The LTSI and TSRS both incorporate the use of five-point, Likert-type scales. The instrument items written to measure the extent of

training transferred were based upon Marguerite Foxon's conceptual framework of partial transfer and developed by the researcher. All items adapted for use in this study incorporate a six-point, Likert-type scale with one exception. One item used to measure partial transfer asked the participant for a percentage of training transferred.

Variables

The variables examined in this research were selected based upon Marguerite Foxon's proposal of the transfer of training process. Four of the stages of transfer are variables in this study: intention to transfer, initiation of transfer, extent of transfer, and maintenance of transfer. In addition, the four factors Foxon identified as having significant effect on transfer are variables in this study as well: organizational climate factors, individual learner characteristics, training design factors, and training delivery factors (Foxon, 1993). The survey instrument was built to quantify each of these variables.

Intention to Transfer. As stated previously, intention to transfer was defined as the end-of-training motivation of an individual to transfer what has been learned. The motivation to transfer has been incorporated into the instrument through the use of the following statements:

- I am motivated to start using what I've learned.

- I intend to apply this training to my job.

- I expect I will apply some parts of what I learned and not other parts.

- As time passes, I anticipate using varying degrees of what I learned from this training.

- This training will result in permanent change in the way I do my job.

Initiation of Transfer. This was the step at which the learner attempts to apply or does not attempt to apply what was learned in training.   The initiation of transfer has been incorporated into the instrument through the use of the following statements:

- After training, I began to apply what I learned.

- Initially, I started using the training at work.

- I did not attempt to use the training at work. (Reverse Coded)

Partial Transfer. Partial transfer was when some learning transfers and some learning does not. In this study, partial transfer and extent of transfer are used interchangeably (until the last chapter when new definitions are proposed) to indicate a percentage of learning that transfers (versus the percent of learning that fails to transfer). This variable is the least studied of the set (Foxon, 1993), and it has been incorporated into the instrument through the use of the following statements and question:

- I applied parts of what I learned and not other parts.

- As time passes, I am using less of what I learned from this training.

- What percentage of this training have you applied at work?

Maintained Transfer. This was the continued use of what has been transferred. It has been incorporated into the instrument through the use of the following statements:

- This training has resulted in permanent change in the way I do my job.

- I will maintain the practices I learned in this training for as long as I have my current job.

Organizational Climate Factors. These factors deal with the organizational environment into which the training will be transfer. The primary indicator of organizational climate is supervisor and peer support (Holton, Bates, & Ruona, 2000). These have been incorporated into the instrument through the use of the following statements:

- My supervisor met with me after the training to discuss applying what I learned to my job.

- I received feedback at work from my supervisor regarding my application of this training.

- My colleagues have encouraged me to apply what I learned in this training.

- I received feedback at work from my peers regarding my application of this training.

Individual Learner Characteristics. Foxon described this category as dealing with a learner's motivation related to his/her ability to see the relevance in the training. It also deals with a learner's ability to grasp the training the way it is delivered. This is the first of three variables that comprise a student's reaction to the training. This has been incorporated into the instrument though the use of the following statements:

- The training I received has been useful for my personal development and career growth.

- I learn better when taught by a good instructor rather than by a good computer program.

- I prefer to learn through the use of a computer rather than in a classroom with others.

Training Design Factors. This category was characterized by Foxon as referring to the course content. Specifically, the design factors deal with how well the course content resembles the on-the-job requirements for application. The primary indicator of quality design is the practicality or applicability of the content to the workplace (Broad & Newstrom, 1992). This is the second of three variables that comprise a student's reaction to the training. It has been incorporated into the instrument though the use of the following statements:

- The training I received was practical and useful for my job.

- The practical exercises were a good reflection of my actual work setting.

Training Delivery Factors. This was the primary variable dealing with the learner's reaction to the training. The category deals with the delivery methods and style. It has been incorporated into the instrument though the use of the following statements:

- The length of the course was adequate for the objectives and content.

- The issues were dealt with in as much depth as the length of the course allowed.

- The training context/method was well suited to what I needed to learn in the course.

Data Collection and Analysis

Data collection took place from September 2013 to March 2014. E-mails to

participants were sent by SGR with the link to SurveyMonkey for the participant to

click. The data was transferred from SurveyMonkey via Excel file and loaded into SPSS

for analysis.

Reliability. Instrument consistency was examined through the calculation of

Cronbach's Alpha. The calculation was performed on each set of variables. The

internal consistency results indicated an acceptable level of instrument consistency.

Correlations. A correlational analysis was performed on each of the variables

identified above. Pair-wise correlations are reported for each in Chapter 4. The

purpose of the correlation analysis was to identify the relationships between not only

the varables in Foxon's model but also to include two additional variables.

Organizational support and reaction to training were also included in the correlation

analysis.

Stepwise Regression Analysis. Regression calculations formed the basis of the

analysis of Foxon's proposed stages of transfer. Linear regression was used to test

several of the research hypotheses that examined the prediction of one variable by

another. For the research questions dealing with the model, stepwise regression was

used. In stepwise regression, every dependent variable identified in the research

hypotheses based on the model is regressed on every independent variable that has

been predicted to affect it (Ary, Jacobs, Razavieh & Sorensen, 2006).   In the process,

independent variable effects that lose significance on the dependent variables are dropped from the model.

Mediation. There were several mediation relationships hypothesized in this study. A mediator is defined as a variable that intervenes in the relationship between a predictor and outcome variable (Baron & Kenny, 1986). The variables hypothesized to be mediators are those identified in the literature as being significant predictors of multiple stages of the transfer of training model (Burke & Hutchins, 2007; Foxon, 1993). The test for mediation will consist of a three step process. For the first step, the outcome variable is regressed onto the predictor variable. To fulfill the test, statistical significance should be found. In the second step, the mediator is regressed onto the predictor variable. To fulfill the test, statistical significance should be found. The outcome variable is then regressed onto both the predictor and the mediator in the third step. To fulfill the test for mediation, the regression coefficient of the mediator variable is statistically significant. If the predictor variable is not a significant predictor of the outcome variable in this last test, the mediator variable is considered to fully mediate the relationship between the predictor variable and outcome variable (Baron & Kenny, 1986). Based on the results of the correlation analysis, regression analysis, and mediation analysis described above, a predictive model consistent with the data was proposed in the final chapter.

Chapter 4: Results

Data for the study were collected until March of 2014 and analyzed at that time. This chapter reports the characteristics of the sample, the relationships between the variables, and the results of hypothesis testing. The existing transfer of training model was examined and expanded based on the data collected.

Sample Characteristics

The two surveys were sent to 170 training participants. There were 66 total responses. The first survey had 40 responses (N=40). The follow-up survey had 26 responses (N=26). This represents a total response rate of 23% for the initial survey and 15% for the follow-up survey. This response rate was similar to other studies cited in this paper (Saks & Belcourt, 2006; Hutchins & Burke, 2007). And, the sample size was similar to that of Noe and Schmitt (1986) who analyzed 44 complete responses for their path analysis of their trainee attitude model.

Table 4-1 summarizes the demographic data from the responses. The sample consisted of 22 males and 44 females. The average ages were 39 for males and 42 for females. The education levels of the survey participants were summarized in Table 4-2. There were no significant differences between male and female education levels.

Table 4-1. Demographic Summary

Gender	Number	Percent	Minimum Age	Maximum Age	Mean Age
Female	44	67	24	60	41.9
Male	22	33	26	71	39.1

Table 4-2. Education Levels

Education Attained	Number	Percent
High School Diploma	22	34
Bachelor's Degree	17	26
Master's Degree	24	37
Doctorate Degree	2	3

Variables

The first survey measured the participants' reaction to the training (training design factors, training delivery factors, individual learner characteristics), perception of organizational support, and intention to transfer the training. Cronbach's alpha was calculated for the set of questions comprising each variable. These were summarized in Table 4-3. The reliability of each of these measures was high (Kline, 2005). The variables were computed by taking the sum of the contributing questions.

Table 4-3. Reliability of the Survey Items Comprising the First Survey's Variables

Variable	Sample Question	Survey Items	Cronbach's Alpha
Intention to Transfer	I am motivated to start using what I've learned	9, 17, 22, 23	.830
Organizational Support	My colleagues will encourage me to apply what I have learned in this training	10, 13, 20	.799
Reaction to Training	The practical exercises were a good reflection of my actual work setting	7, 11, 12, 15, 16	.797

The second survey measured the participants' experiences following the training. The variables in this survey were intention to transfer, initiation of transfer, partial transfer, maintained transfer, supervisor support, peer support, and reaction to training. Cronbach's alpha was calculated for the set of questions comprising each variable. These were summarized in Table 4-4. The variables were computed by summing the identified survey items. The reliability of these measures was also high with the exception of organizational support (acceptable) maintained transfer (poor) (Kline, 2005). The poor reliability of the maintained transfer variable was due primarily to a non-normal distribution of the responses. A statistical test for normality was conducted, but the statistic was not significant. Table 4-6 summarizes the test.

Table 4-4. Reliability of the Survey Items Comprising the Second Survey's Variables

Variable	Sample Question	Survey Items	Cronbach's Alpha
Intention to Transfer	When I finished the class, I intended to apply this training to my job.	9, 22	.946
Initiation of Transfer	Initially, I started using the training at work.	7, 15, 18	.709
Partial Transfer	What percentage of that training have you applied at work	19, 24	.805
Maintained Transfer	This training has resulted in permanent change in the way I do my job	17, 23	.521
Organizational Support	My supervisor met with me after the training to discuss applying what I learned to my job	8, 10, 13	.634
Reaction to the Training	The training I received was practical and useful for my job	11, 12, 16	.708

In addition to the variables based on Likert-type responses, question #24 from the second survey asked the respondents to think about the goals, objectives, and content of the course and select a percentage of the course they have applied at work.

The alpha reported for the partial transfer variable was based on standardizing the percentage scale with that of the Likert scale.

Overall, both instruments had very high reliability. The only potential problem was in the maintained transfer variable. Alpha for that variable was unusually poor. Responses on item 23 clustered toward the extreme (0 and 5). This was expected, however, due to the nature of maintained transfer. Transfer was either maintained, or it was not.

In addition to examining the reliability of the instruments, principle components analysis was performed on both surveys to further examine the items comprising each variable. Because the number of survey items was small, the intent was not necessarily to reduce the number of items for analysis. The purpose was to identify contributions items made within a variable and the contributions items made to other variables. The analysis was performed on each survey by separating the items originating from the satisfaction rating from the transfer of training scale.

Table 4-5 summarized the item loadings for the principal component analysis of the reaction survey satisfaction items. These items comprised the organizational support and reaction to training variables. All of the items on this scale load strongly onto the expected component with the exception of item 11. It is the only one that does not have a strong load onto its component.

Table 4-5. Principle Components of Reaction and Organizational Support Variables

Item	Reaction	Organizational Support
10	.107	.833
13	.318	.816
20	.163	.799
7	.838	-.034
11	.394	.077
12	.836	.387
15	.722	.499
16	.706	.325

Note. Principal component analysis with Varimax rotation.

There was only one transfer of training construct on the first survey. It was comprised of four items. All four items were significantly correlated with one another at the p <.05 level. The single component these transfer of training items comprised accounted for 81.7 % of the variance in the items. The eigenvalue was 3.268.

Table 4-6 summarized the item loadings for the principal component analysis of the follow up survey satisfaction items. These items comprised the organizational support and reaction to training variables. All of the items on this scale load strongly onto the expected component with the exception of item 13. It is the only one that does not have a strong load onto its component.

Table 4-6. Principle Components of Reaction and Organizational Support Variables

Item	Reaction	Organizational Support
8	.004	.857
10	-.084	.888
13	.051	.435
11	.704	-.050
12	.906	-.130
16	.751	.454

Note. Principal component analysis with Varimax rotation.

There were four transfer of training variables measured on the follow up survey. The intention to transfer, initiation of transfer, and maintained transfer variables were all measured on a six point Likert scale. The partial transfer variable was measured as a percentage from 0 to 100. Because of the difference in scale, the partial transfer variable was not included in the component analysis summarized in Table 4-7. The results of this analysis indicated that the items were largely contributing to their components as predicted.

Two items did not load as predicted. The first was item 18: I did not attempt to use the training at work. Reverse coded, it was predicted to load with the initiation of training variable. In the component analysis, it did not load onto any of the variables. The second item was number 23: I will maintain the practices I learned in this training for as long as I have my current job. While this item was significantly

correlated with item 17 (r = .352, p = .042) in a one-tailed test, the items did not load

together. Instead, item 17 loaded with the intention to transfer variables.

Table 4-7. Principle Components of the Transfer of Training Variables

Item	Intention	Initiation	Maintained
9	.721	.454	.335
22	.857	.447	.157
7	.372	.829	.164
15	.210	.913	.208
18	.292	.182	.127
17	.282	.273	.916
23	.744	.055	.175

Note. Principal component analysis with Varimax rotation.

Correlations

To begin examining the relationships among the variables, correlation

calculations were performed. The Pearson Product-Moment Correlation Coefficient

for each pair of variables was reported in Table 4-8 and Table 4-9.

Table 4-8. Correlation Coefficients for Variables in the First Survey

Variable	Organizational Support	Reaction
Intention	.715*	.782*
Org Support	-	.523*

Note. *p < .05, two-tailed.

Table 4-9. Correlation Coefficients for Variables in the Second Survey

Variable	Initiation	Partial	Maintained	Org Support	Reaction
Intention	.644*	.573*	.701*	.173	.389
Initiation	-	.729*	.480*	-.071	.497*
Partial		-	.579*	.243	.483*
Maintained			-	.233	.448*
Org Support				-	.094

Note. *p < .05, two-tailed.

The normality assumption for the data set was tested by performing the Shapiro-Wilk test on each variable. Each of the variables was tested for violations of the normality assumption. The results for these tests were summarized in Table 4-10 below. Based on the results, the normality assumption was satisfied. However, the normality of the maintained transfer variable was suspect.

Table 4-10. Shapiro-Wilk Test of Normality Results

Variable	Statistic	Significance
Org Support	.968	.606
Reaction	.944	.186
Intention	.958	.375
Initiation	.916	.127
Partial	.964	.711
Maintained	.893	.052

Because transfer of training was being examined as steps along an overall transfer of training process, multicollinearity was examined prior to hypothesis testing and path analysis of the model. The variance inflation factor (VIF) for each of the independent variables was calculated and summarized in Table 4-11. None of the VIFs approached 10. The multicollinearity assumption was satisfied (Lomax, 2001).

Table 4-11. Variance Inflation Factors for the Independent Variables of the Model

Independent

Variables	Intention	Initiation	Partial	Org Support	Reaction
Intention	-	1.546	1.858	1.834	1.887
Initiation	2.225	-	1.899	2.605	2.638
Partial	2.534	1.775	-	2.365	2.272
Org Support	1.211	1.203	1.225	-	1.110
Reaction	1.566	1.472	1.422	1.341	-

Note. Dependent variables for each iteration of regression are listed across the top of the table as column headings.

Hypothesis Testing

The findings regarding each of the research hypotheses are reported in this section. The statistical test performed for each is briefly described. The key outputs are reported. Then, each hypothesis is stated to either supported or rejected.

H_1: *Intention to transfer, initiation of transfer, extent of transfer, and maintained transfer are all correlated.* Table 4-9 summarized the correlations between the stages of Foxon's model. Intention to transfer was significantly

correlated with all three of the other transfer of training variables at the p < .05 level.

Partial transfer was also significantly correlated with the other three at that level. All

of the correlations were positive and had large effect sizes (Lomax, 2002). The

hypothesis was supported.

Table 4-12. Summary of Individual Regression Analyses for the Stages of Training Transfer

Independent Variable	Dependent Variable	Adjusted R^2	B	SE B	β
Intention	Initiation	.389	.608	.151	.644*
Initiation	Partial	.510	8.239	1.651	.729*
Partial	Maintained	.305	.046	.014	.579*

Note. *p < .05, two-tailed.

H_2: *High intention to transfer will predict high initiation of transfer*. The

intention to transfer variable and the initiation of transfer variable were significantly

positively correlated. When initiation of transfer was regressed onto intention to

transfer, the F-test of R^2 was significant with p < .05. Approximately 39% of the

variability in initiation was explained by intention. The model predicts that for every

increase of one on intention, initiation will increase by .608. The hypothesis was

supported, and the results were summarized in Table 4-12.

H_3: *High initiation of transfer will predict extensive transfer*. The initiation of

transfer variable and the partial transfer variable were significantly positively

correlated. When partial transfer was regressed onto initiation of transfer, the F-test

of R^2 was significant with p < .05. Approximately 51% of the variability in partial

transfer was explained by initiation. The model predicts that for every increase of one

on initiation, the percentage of training transferred increased 8.2%. The hypothesis

was supported, and the results were summarized in Table 4-12.

H_4: *High extent of transfer will predict high maintenance of transfer.* The partial

transfer variable and the maintained transfer variable were significantly positively

correlated. When maintained transfer was regressed onto partial transfer, the F-test

of R^2 was significant with $p < .05$. About 31% of the variability in maintained transfer

was explained by partial transfer variable. The hypothesis was supported with the

results summarized in Table 4-12.

H_5: *Intention to transfer will mediate the relationships between the initiation of*

transfer, partial transfer, and maintenance of transfer variables. The first step for

testing mediation was performed in the H_3 test of the prediction partial transfer by

initiation of transfer. In the second step, intention to transfer was regressed onto the

initiation of transfer. The test was significant with $p < .05$ and beta of .644. When

partial transfer was regressed onto initiation and intention in the third step, intention

to transfer was no longer a significant predictor. The results were summarized in Table

4-13. The test indicates that intention does not mediate the relationship between

initiation and extent. In fact, the initiation variable seems to mediate the relationship

between intention and extent.

The first step for testing the mediation of intention between extent of transfer

and maintained transfer was performed in the H_4 test. Extent of transfer was a

significant predictor of maintained transfer. In the second step, intention to transfer

was regressed onto the extent of transfer. The test was significant with p < .05 and

beta at .573. When maintained transfer was regressed onto extent of transfer and

intention to transfer in the third step, intention was a significant predictor of

maintained transfer while partial transfer was not. Intention to transfer was mediating

the relationship between partial and maintained transfer, and the results were

summarized in Table 4-14.

The last mediation test of the intention to transfer was between the variables

initiation of transfer and maintained transfer. In the first step, maintained transfer

was regressed onto initiation of transfer. The F-test of R^2 was significant with p < .05.

Intention was then regressed onto initiation in the second step. This was also

significant with p < .05. Finally, maintained transfer was regressed onto intention and

initiation. Only intention remained as a significant predictor of maintained transfer in

the model. Therefore, intention to transfer mediates the relationship between

initiation of transfer and maintained transfer. These steps were summarized in Table

4-15. Intention to transfer mediated two of the three relationships in the transfer of

training model. The hypothesis was partially rejected and partially supported.

Table 4-13. Test for the Mediation of Intention between Initiation and Extent of Transfer

	Independent Variable(s)	Dependent Variable	Adjusted R^2	B	SE B	β
Step 1	Initiation	Partial	.510	8.239	1.651	.729*
Step 2	Initiation	Intention	.389	.682	.169	.644*
Step 3	Initiation	Partial	.504	6.991	2.196	.618*
	Intention			1.706	1.965	.169

Note. *p < .05, two-tailed.

Table 4-14. Test for the Mediation of Intention between Extent and Maintenance of Transfer

	Independent Variable(s)	Dependent Variable	Adjusted R^2	B	SE B	β
Step 1	Partial	Maintained	.305	.046	.014	.579*
Step 2	Partial	Intention	.298	.057	.017	.573*
Step 3	Partial	Maintained	.497	.021	.014	.261
	Intention			.446	.145	.553*

Note. *p < .05, two-tailed.

Table 4-15. Test for the Mediation of Intention between Initiation and Maintained Transfer

	Independent Variable(s)	Dependent Variable	Adjusted R^2	B	SE B	β
Step 1	Initiation	Maintained	.197	.407	.155	.480*
Step 2	Initiation	Intention	.389	.682	.169	.644*
Step 3	Initiation	Maintained	.447	.041	.169	.048
	Intention			.538	.159	.670*

Note. *p < .05, two-tailed.

H_6: *Reaction to training will predict intention to transfer training.* The reaction to training variable and the intention to transfer variable were significantly positively correlated. When intention to transfer was regressed onto reaction, the F-test of R^2 was significant with p < .05. Approximately 60% of the variability in intention to transfer was explained by the reaction to training. The model predicts that for every increase of one on reaction, the increase in intention to transfer will be .778. The hypothesis was supported, and the results were summarized in Table 4-16.

H_7: *Organizational support of the training will predict intention to transfer training.* The organizational support variable and the intention to transfer variable were significantly positively correlated. Approximately 50% of the variability in intention to transfer was explained by the organizational support for the training. When intention to transfer was regressed onto organizational support, the F-test of R^2 was significant with p < .05. The model predicts that for every increase of one on

organizational support, the increase in intention to transfer was .729. The hypothesis

was supported, and the results were summarized in Table 4-16.

Table 4-16. Summary of Individual Regression Analyses of Intention to Transfer onto Reaction and Organizational Support

Independent Variable	Dependent Variable	Adjusted R^2	B	SE B	β
Reaction	Intention	.601	.778	.103	.782*
Org Support	Intention	.498	.729	.119	.715*

Note. *p < .05, two-tailed.

H_8: *Organizational support of the training will mediate the interaction between the learner's reaction to training and their intention to transfer*. The first step for

testing mediation was performed in the H_6 test of the prediction of intention transfer

by reaction to the training. In the second step, organizational support was regressed

onto the reaction to training. The test was significant with p < .05 and beta of .523.

When intention to transfer was regressed onto reaction to training and organizational

support in the third step, both were significant predictors of intention to transfer

indicating partial mediation. The regression results were summarized in Table 4-17. A

Sobel test based on the unstandardized betas and standard errors indicates a

significant mediation of organizational support at the .05 level on the relationship

between reaction to the training and intention to transfer. The hypothesis was

supported.

Table 4-17. Test for the Mediation of Organizational Support between Reaction to Training and Intention to Transfer

	Independent Variable(s)	Dependent Variable	Adjusted R^2	B	SE B	β
Step 1	Reaction	Intention	.601	.778	.103	.782*
Step 2	Reaction	Org Support	.253	.489	.131	.523*
Step 3	Reaction	Intention	.722	.558	.102	.561*
	Org Support			.426	.104	.417*

Note. *p < .05, two-tailed.

H_9: *Reaction to training will predict the initiation of training transfer.* The reaction to training and the initiation of transfer variables were significantly positively correlated. When initiation of transfer was regressed onto reaction, the F-test of R^2 was significant with p < .05. Approximately 21% of the variability in initiation of transfer was explained by the reaction to training. The model predicts that for every increase of one on reaction, the increase in initiation of transfer was .435. The hypothesis was supported, and the results were summarized in Table 4-18.

H_{10}: *Reaction to training will predict the extent of training transferred.* The reaction to training and the partial transfer variables were significantly positively correlated. When partial transfer was regressed onto reaction, the F-test of R^2 was significant with p < .05. Approximately 20% of the variability in partial transfer was explained by the reaction to training. The hypothesis was supported, and the results were summarized in Table 4-18.

H_{11}: *Reaction to training will predict the maintained transfer of training*. The

reaction to training and the maintained transfer variables were significantly positively

correlated. When maintained transfer was regressed onto reaction, the F-test of R^2

was not significant with $p < .05$. Approximately 17% of the variability in maintained

transfer was explained by the reaction to training. The model predicts that for every

increase of one on reaction, the increase in initiation of transfer will be .333. The

hypothesis was supported, and the results were summarized in Table 4-18.

H_{12}: *Organizational Support will predict the initiation of training transfer*. The

organizational support and the initiation of transfer variables were not correlated with

R approaching zero. When initiation of transfer was regressed onto organizational

support, the F-test of R^2 was not significant. The hypothesis was rejected, and the

results were summarized in Table 4-18.

H_{13}: *Organizational Support will predict the extent of training transferred*. The

organizational support and the partial transfer variables were not correlated, but the

relationship between them was positive. When partial transfer was regressed onto

organizational support, the F-test of R^2 was not significant. The hypothesis was

rejected, and the results were summarized in Table 4-18.

H_{14}: *Organizational Support will predict the maintained transfer of training*.

The organizational support and the maintained transfer variables were not correlated,

but the relationship between them was positive. When partial transfer was regressed

onto organizational support, the F-test of R^2 was not significant. The hypothesis was

rejected, and the results were summarized in Table 4-18.

Table 4-18. Summary of Individual Regression Analyses of the Transfer Model onto Reaction and Organizational Support

Independent Variable(s)	Dependent Variable	Adjusted R^2	B	SE B	β
Reaction	Initiation	.215	.435	.158	.497*
Reaction	Partial	.199	4.869	1.880	.483*
Reaction	Maintained	.166	.333	.139	.448*
Org Support	Initiation	.005	-.051	.151	-.071
Org Support	Partial	.016	2.265	1.925	.243
Org Support	Maintained	.013	.144	.125	.233

Note. *p < .05, two-tailed.

H_{15}: *Reaction to Training and Organizational Support will mediate the relationship between motivation to transfer and initiation of transfer.* Because organizational support was not a significant predictor of any of the transfer of training stages, it was not further analyzed to test this hypothesis. The first step for testing the mediation of reaction was performed in the H_2 test of the prediction of initiation of transfer by intention to transfer. In the second step, reaction to training and was regressed onto the intention to transfer. The test was significant with p < .05. In the third step, initiation was regressed onto intention and reaction. In this test, the intention to transfer was the only one to remain an individually significant predictor of initiation of transfer. The hypothesis was rejected and the results were summarized in Table 4-19.

Table 4-19. Test for the Mediation of Reaction between Intention to Transfer and Initiation of Transfer

	Independent Variable(s)	Dependent Variable	Adjusted R^2	B	SE B	β
Step 1	Intention	Initiation	.389	.608	.151	.644*
Step 2	Intention	Reaction	.151	.419	.207	.398*
Step 3	Intention	Initiation	.440	.502	.157	.531*
		Reaction		.255	.145	.291

Note. *p < .05, two-tailed.

H_{16}: *Reaction to Training and Organizational Support will mediate the relationship between initiation of transfer and the extent of transfer*. Because organizational support was not a significant predictor of any of the transfer of training stages, it was not further analyzed to test this hypothesis. The first step for testing the mediation of reaction was performed in the H_3 test of the prediction of extent of transfer by initiation of transfer. In the second step, reaction to training was regressed onto the initiation of transfer. The test of reaction was significant with $p < .05$. In the third step, partial transfer was regressed onto initiation of transfer and reaction to training. In that test, initiation of transfer was the only one to remain an individually significant predictor of partial transfer. The hypothesis was rejected, and the results were summarized in Table 4-20.

Table 4-20. Test for the Mediation of Reaction between Initiation of Transfer and Extent of Transfer

	Independent Variable(s)	Dependent Variable	Adjusted R^2	B	SE B	β
Step 1	Initiation	Partial	.510	8.239	1.651	.729*
Step 2	Initiation	Reaction	.215	.568	.207	.497*
Step 3	Initiation	Partial	.526	7.221	1.795	.639*
	Reaction			2.124	1.599	.211

Note. *p < .05, two-tailed.

H_{17}: *Reaction to Training and Organizational Support will mediate the relationship between extent of transfer and maintained transfer*. Because organizational support was not a significant predictor of any of the transfer of training stages, it was not further analyzed to test this hypothesis. The first step for testing the mediation of reaction was performed in the H_4 test of the prediction of maintained transfer by partial transfer. In the second step, reaction to training was regressed onto the extent of transfer. The test of reaction was significant with p < .05. In the third step, maintained transfer was regressed onto partial transfer and reaction to training. In that test, partial transfer was the only one to remain an individually significant predictor of maintained transfer. The hypothesis was rejected, and the results were summarized in Table 4-21.

Table 4-21. Test for the Mediation of Reaction between Extent of Transfer and Maintained Transfer

|	Independent Variable(s)	Dependent Variable	Adjusted R^2	B	SE B	β
Step 1	Partial	Maintained	.305	.046	.014	.579*
Step 2	Partial	Reaction	.199	.048	.019	.483*
Step 3	Partial	Maintained	.330	.036	.016	.451*
	Reaction			.211	.156	.263

Note. *p < .05, two-tailed.

Path Analysis

The paired regression analyses summarized in the previous section indicate support for the transfer of training process and model. Each step was a significant predictor of the next step. And, two of the effect sizes were large. These were summarized in Figure 4.

Figure 4. Regression Summary for the Individual Stages of the Transfer Process

* Significant at the .05 level   (Foxon, 1993)
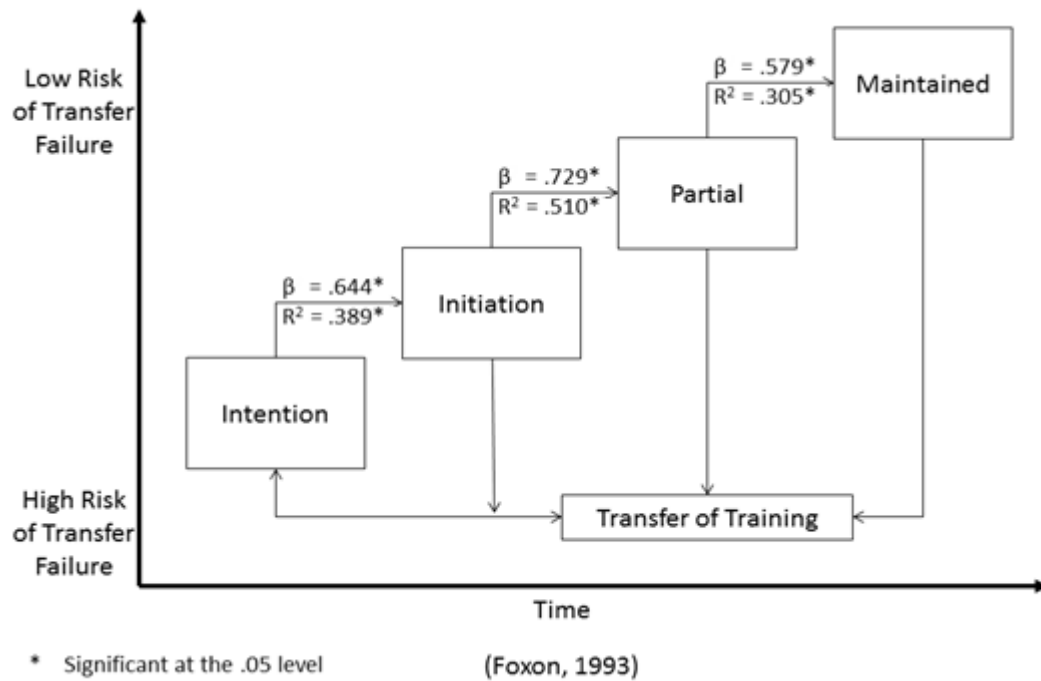
There were other statistical relationships between these variables. In testing

H_5, initiation of transfer was shown to mediate the relationship between intention to

transfer and partial transfer. This mediation supports the proposed model. However,

the finding that the intention to transfer mediated the relationship between partial

transfer and maintained transfer deviated from the model. Another test of mediation

was summarized in this section in Table 4-22. It dealt with the potential mediating

relationship of partial transfer between initiation of transfer and maintained transfer.

Partial transfer was not a significant individual predictor in the third step of the test.

Partial transfer did not mediate between initiation of transfer and maintained transfer.

Table 4-22. Test for the Mediation of Partial Transfer between Initiation of Transfer and Maintained Transfer

	Independent Variable(s)	Dependent Variable	Adjusted R^2	B	SE B	β
Step 1	Initiation	Maintained	.197	.407	.155	.480*
Step 2	Initiation	Partial	.510	8.239	1.651	.729*
Step 3	Initiation	Maintained	.288	.164	.231	.182
	Partial			.036	.020	.446

Note. *p < .05, two-tailed.

Stepwise Regression. All of the variables in the initial transfer of training model were significantly correlated with one another when examined pairwise. The stepwise regression analysis of the variables was intended to evaluate the most significant predictors of each step of the model. Variables were excluded from the model when they did not significantly increase R^2. When stepwise regression was performed on the model in which intention to transfer, initiation of transfer, and extent of transfer were independent variables and maintained transfer was the dependent variable, only intention to transfer was included in the model. The intention to transfer R^2 was equal to .472, and it was significant with $p < .05$. Neither of the other two variables brought about a significant change of R^2. They were excluded from the model.

Stepwise regression of the partial transfer variable onto intention and initiation yielded only one significant predictor as well. In this test, initiation was the only variable entered into the model with $R^2 = .510$ and $p < .05$. Intention to transfer did not bring about a significant change of R^2. It was excluded from the model.

In addition to the transfer variables, the reaction to training and organizational support variables were added to the stepwise regression model. When maintained transfer was regressed onto all variables, intention to transfer was the only variable significantly affecting R^2. When partial transfer was regressed onto the remaining variables, initiation of transfer was the only variable significantly affecting R^2. When initiation of transfer was regressed onto the remaining variables, intention to transfer was the only variable significantly affecting R^2. The effects of reaction and organizational support did not have significant direct effects on the stages of transfer beyond intention to transfer. The results of the stepwise regression were summarized in Table 4-23.

Table 4-23. Stepwise Regression of Included Transfer of Training Independent Variables

Independent Variable(s)	Dependent Variable	Adjusted R^2	B	SE B	β
Intention	Maintained	.472	.567	.122	.703*
Initiation	Partial	.510	8.239	1.651	.729*
Intention	Initiation	.389	.608	.151	.644*

Note. *p < .05, two-tailed.

Revised Model. While the data supported the original model of the stages of transfer, the data also indicated more complex relationships between the variables. From the hypotheses tests, a new model was drawn for the transfer of training variables. The revised model was illustrated in Figure 5. In addition to the hypothesis testing, another mediating relationship was tested. This test was for the mediation of

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partial transfer between the intention to transfer and the initiation of transfer, and the results were summarized in Table 4-24. The first step for testing mediation was performed in the H_2 test of the prediction initiation of transfer by intention to transfer. In the second step, partial transfer was regressed onto the intention to transfer. The test was significant with a beta of 5.799 and p < .05. When initiation of transfer was regressed onto intention and partial transfer in the third step, both were significant predictors. The Sobel test of the betas and standard errors yielded a statistic of 2.266 that was significant with p < .05. Therefore, the revised model shown in Figure 5 summarizes the findings of this study added to the original support for Foxon's model.

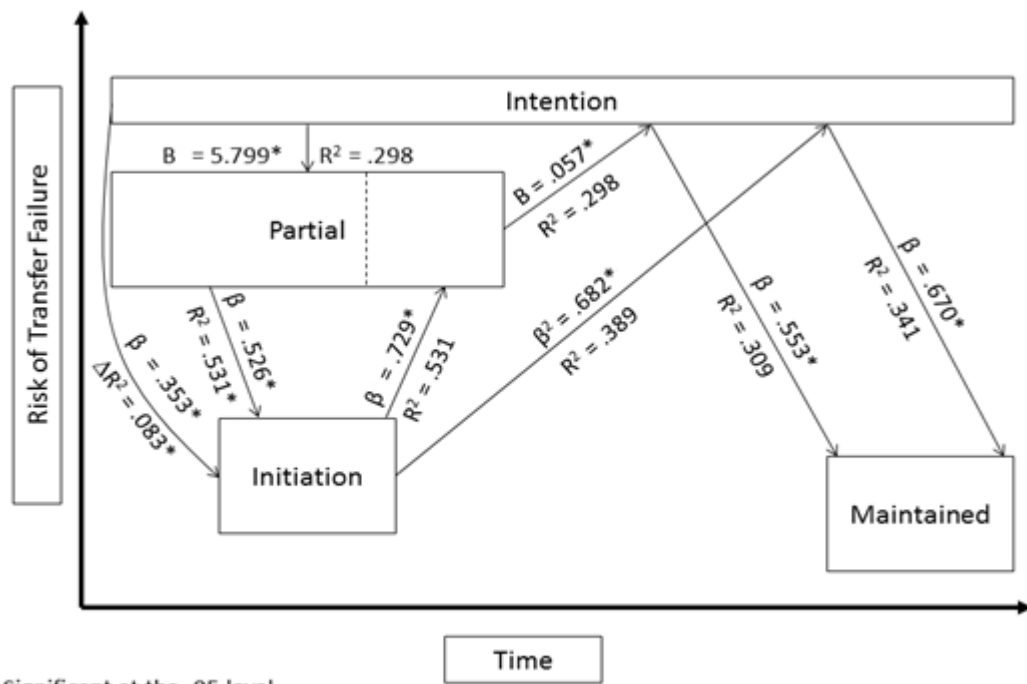- Intention to transfer fully mediated the relationship between initiation of transfer and maintained transfer.

- Intention to transfer fully mediated the relationship between partial transfer and maintained transfer.

- Initiation of transfer fully mediated the relationship between intention to transfer and partial transfer.

- Partial transfer partially mediated the relationship between intention to transfer and initiation of transfer.

Table 4-24. Test for the Mediation of Partial Transfer between Intention to Transfer and Initiation of Transfer

	Independent Variable(s)	Dependent Variable	Adjusted R^2	B	SE B	β
Step 1	Intention	Initiation	.389	.608	.151	.644*
Step 2	Intention	Partial	.298	5.799	1.767	.573*
Step 3	Intention	Initiation	.578	.315	.148	.353*
	Partial			.047	.015	.526*

Note. *p < .05, two-tailed.

Figure 5. Path Analysis of the Stages in the Transfer Process

* Significant at the .05 level

Additions to the Model. Even though organizational support and reaction to training were identified by Foxon as influencing the stages of transfer, neither were included in the original model. Reaction to training and organizational support were

both found to be significant predictors of intention to transfer in H_6 and H_7 with organizational support partially mediating the relationship between reaction and intention to transfer. Reaction to training was also a significant predictor of initiation of transfer and maintained transfer in H_9 and H_{11}. However, in the H_{15} test, intention to transfer mediated the relationship between reaction and initiation. Table 4-25 summarizes the mediation of intention between reaction and maintained transfer. Intention to transfer fully mediated the relationship between the other two variables. The additions to the model were summarized in Figure 6.

Table 4-25. Test for the Mediation of Intention to Transfer between Reaction and Maintained Transfer

	Independent Variable(s)	Dependent Variable	Adjusted R^2	B	SE B	β
Step 1	Reaction	Maintained	.166	.333	.139	.448*
Step 2	Reaction	Intention	.114	.360	.178	.389*
Step 3	Reaction	Maintained	.485	.154	.118	.207
	Intention			.498	.128	.621*

Note. *p < .05, two-tailed.

Figure 6. Proposed Transfer of Training Process Based upon the Study Variables
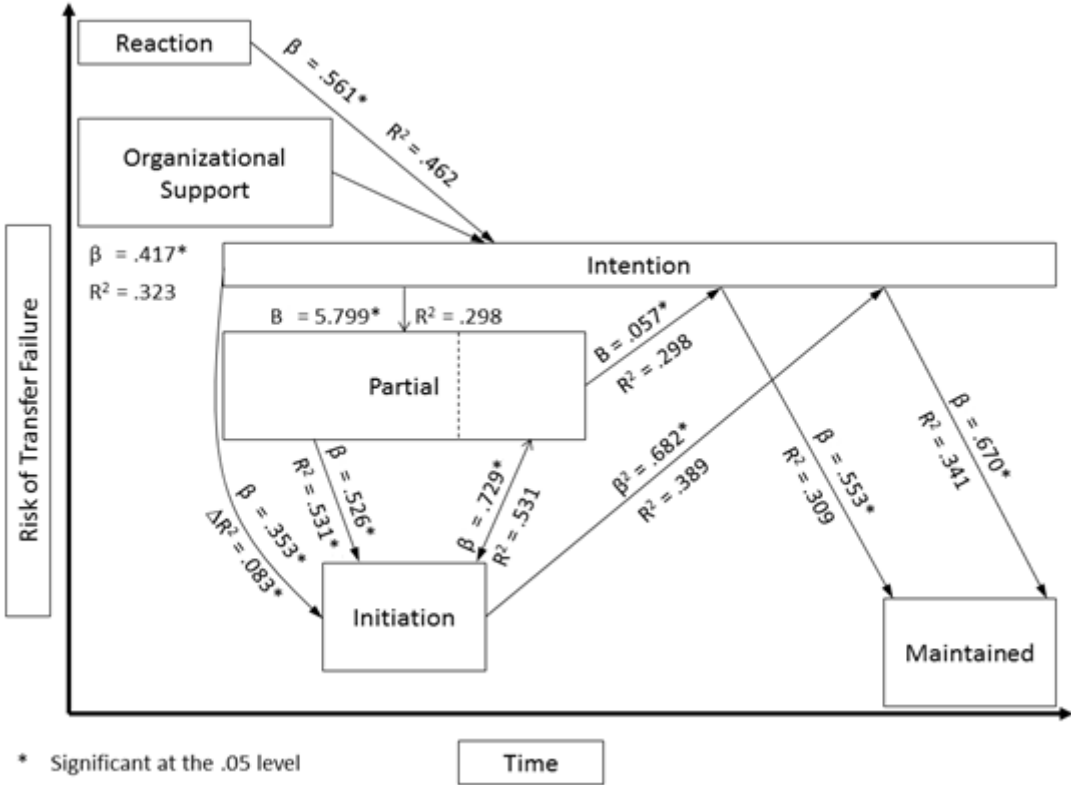
Chapter 5: Discussion

This study examined the relationships between several variables affecting the maintained transfer of training from the classroom to the workplace. The results reported in the previous chapter provide clarity regarding the relationships between these variables. The transfer of training process model was generally supported, but the findings of this study resulted in modification of the model.

In this chapter, the findings from hypothesis testing were discussed in terms of the research questions. The significance of partial transfer is discussed and the definition is expanded and differentiated from the extent of transfer. Many of the recommendations for future research that follow were based on the proposed treatment of partial transfer and a new theoretical model with an expanded emphasis on the extent of transfer.

Research Questions

The research questions at the foundation of this study were investigated through two separate surveys of training participants. The follow-up survey was the transfer of training survey. The results of this survey were used to answer the questions that dealt with Foxon's model and the effects of reaction and organizational support on it. The other question was answered through the results of the reaction survey taken immediately after the training ended.

What is the relationship between each stage of Foxon's Transfer of Training Process? The stages of transfer were highly correlated without being multicolinear. Correlation was expected because each stage is in service of an overall transfer of

training construct. Multicolinearity was a risk for the same reason. One risk inherent

in the transfer of training model was drawing distinction between steps without a

difference. The results indicated that while each stage is related to the others, those

relationships vary. As such, the transfer of training model parses the overall transfer

of training in a meaningful way.

Intention to transfer or motivation to transfer training is widely emphasized in

the literature to be critical for training to transfer successfully (Baldwin & Ford, 1988;

Burke & Hutchins, 2007; Noe, 2005). The results of this study support that. Intention

has direct effects on initiation of transfer and maintained transfer.

The intention to transfer relationship with maintained transfer is one of the

strongest in the study. The effect that intention to transfer has on maintained transfer

is so strong that it fully mediates the relationships between maintained transfer and

the other two stages in the model. In other words, intention is a better predictor of

maintained transfer than the initial application of learning back at work. This finding is

the first indication that maintained transfer is an individual choice. And, the decision

to maintain behavior is more a function of motivation than of initiating a behavior.

Initiation of transfer is directly affected by intention as well as partial transfer.

The relationship between initiation and partial transfer is the strongest in the study.

Partial transfer partially mediates the relationship between intention and initiation.

The relationship between initiation and partial is the only one that intention does not

mediate, and it is an interesting relationship because partial seems to predict and be

predicted by initiation. Partial transfer is not widely studied or reported in the

literature. The role of partial transfer will be a topic for further research later in the chapter.

What is the relationship between a learner's reaction to training, perceived organizational support of the training, and intention to transfer the training? Reaction to training has been linked with intention to transfer in the literature (Baldwin & Ford, 1988; Burke & Hutchins, 2007). Organizational support of training has also been widely acknowledged to affect intention to transfer (Holton, Bates, Seyler, & Carvalho, 1997; Noe, 2005). This study found that organizational support partially mediated the effect of reaction on intention to transfer. Consistent with the literature, both were still significant individual predictors of intention to transfer in the model. Because of the nature and variations of organizations, this affect may be specific to this sample.

This study will be another in the list of studies that ties Kirkpatrick's Level 1 evaluation with his Level 3 evaluation (Holton, 1996). Learning was not a variable in this study. The training vendor does not measure learning at the conclusion of management training. This is typical for US with 59% of companies not measuring learning. That a reaction survey could be used to predict transfer of training could help the 75% of companies that do measure reaction (ASTD, 2006).

What is the relationship between a learner's reaction to training, organizational support, and each stage of Foxon's Transfer of Training Process? While organizational support was a significant predictor of intention to transfer, this study did not find that organizational support significantly predicted the other stages of training transfer. This finding was unexpected in light of the literature (Holton, Bates, Seyler, & Carvalho,

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1997). There are two possible explanations that emerge from the data. First, the organizational support variable was comprised of items that measured both peer support and supervisor support. Second, the majority of participants simply did not talk with their supervisors about the training.

Generally, respondents indicated that they were more likely to receive information, feedback, and support regarding their training from their peers than they were from supervisors. Without combining it with supervisor support, peer support is the significant predictor of intention to transfer in the first survey. Peer support is also a significant predictor of partial transfer and maintained transfer in the second survey. Like several other relationships among the stages of transfer, the effects of peer support on partial and maintained transfer are mediated by the intention to transfer.

The reaction survey question, "I will receive feedback at work from my supervisor regarding my application of this training" resulted in a mean of 1.72 on the Likert scale from 0 meaning none to 5 meaning definitely. Most did not expect to talk with their supervisors. Remarkably, the number fell on the second survey. For the question, "I received feedback at work from my supervisor regarding my application of this training", the mean dropped to 1.06. The organizational support in this study was the result of peer support rather than supervisor support.

Reaction to training was a significant predictor of intention to transfer. The reaction variable was comprised of three factors: instructional design, training delivery, and learner characteristics. In pairwise regression, each was a significant predictor of intention to transfer. In the stepwise regression, the instructional design

factor is the only significant predictor of intention to transfer. The other two variables

did not add significantly to the model. The primary component of the instructional

design factor was applicability of the content to the workplace and the similarity of the

classroom exercises and examples to the settings in which learning would be applied.

The finding that applicability of content has more of an effect on intention to transfer

than either training delivery factors or individual learner characteristics is consistent

with Adult Learning Theory and the Identical Elements Theory of Transfer (Knowles,

1990; Thorndike, 1913).

Reaction was also a significant predictor of initiation of transfer and maintained

transfer even though intention to transfer mediated those relationships. Again, the

instructional design component of the reaction variable is contributing the majority of

the effect on the other variables. When maintained transfer is regressed onto

intention to transfer and the instructional design factor of reaction, both are

significant predictors. In this relationship, intention to transfer only partially mediates

between instructional design and maintained transfer. The same is true for initiation

of transfer. When it is regressed onto intention to transfer and the instructional

design factor of reaction, intention to transfer only partially mediates the relationship

between instructional design and initiation of transfer.

The relationship between the instructional design factor and partial transfer

was particularly strong. Instructional design seems to mediate the relationship

between intention to transfer and partial transfer. The overall reaction variable did

not have this significant effect as evidenced in the last chapter. The instructional

design factor of learner reaction to training clearly has the greatest effect on the transfer of training process.

Partial Transfer

In addition to finding support for Foxon's model of training transfer, the most significant finding in this study is the role of partial transfer in the overall process. Partial transfer seems to act on the model in three separate places with each having a different role. First, partial transfer holds a position between initiation of transfer and maintained transfer. Secondly, it holds a position between intention and initiation. Finally, partial transfer seems to have a role in the interaction between reaction to training, organizational support, and intention to transfer.

Extent of transfer. Partial transfer as proposed in Foxon's model is a percentage of training that was initiated and maintained. In this definition, partial transfer describes behaviors that were attempted, considered for conscious maintenance, but discontinued. The behaviors that persist then continue to be maintained consciously. Over time, behavior becomes automatic and does not require a conscious choice to maintain.

In the literature, this period after initiation of transfer has been studied in the context of relapse prevention. The relapse prevention initiative to increase training transfer emphasized interventions intended to keep learners applying acquired skills to the workplace (Hutchins &Burke, 2006). The goal of these interventions was to increase the extent of training transfer (not to help learners choose which training to

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continue to use). So in terms of relapse prevention, the label of this partial transfer

variable is more appropriately labeled *extent* of transfer that is maintained.

In this study, the extent of transfer was measured as a percentage of the

training the learners continued to transfer after 30 days. That the extent of training

was so closely related to the initiation of training supports this definition. That

intention mediated the relationship between both extent of transfer and initiation of

transfer with maintained transfer also fits the definition that extent is a conscious

choice to maintain behaviors as a result of intention or motivation.

Partial Transfer. One of the widely reported problems in the area of training

transfer is the initial application of learning to the workplace (Kirkpatrick, 1998). This

area of transfer failure is not a question of the extent of training maintained but a

matter of training not applied at all. Part of the training is initially applied at work, and

part of it is not. There are a number of causes for training not being applied: learning

not taking place, content not applicable to the setting of transfer, opportunity for

transfer not available, or motivation to transfer not sufficient (Baldwin & Ford, 1988;

Broad & Newstrom, 1992; Burke & Hutchins, 2007; Noe, 2005). Some of these factors

are within the learner's control, and some are not.

As stated above, the strongest relationship in this study was the one between

partial transfer and the initiation of transfer. The interaction between these two

variables is in some ways circular. Partial transfer mediates the relationship between

intention and initiation. Initiation mediates the relationship between intention and

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partial.   The partial transfer variable is not acting as the gateway to maintained

transfer. Partial transfer is acting as the gateway to initiation of transfer.

The identification of partial transfer as separate from extent of transfer is an

important distinction. It can mean that the relapse prevention methods that are best

directed at extent of transfer are actually misplaced when directed at partial transfer.

This could be the one of the underlying causes of the mixed support for relapse

prevention interventions affecting transfer of training in the literature (Hutchins &

Burke, 2006).   This distinction between partial transfer and extent of transfer also

increases the relevance of transfer of training plans incorporated into the instructional

design of training as advocated by Broad and Newstrom. As an example, techniques

that include students forming action plans in class of how they will initiate learned

behavior back at work would be classified as a method of affecting partial transfer.

Partial Intentions. The findings reported previously in this paper deal with

partial transfer as a phenomenon occurring after learners are back on the job after

training and measured 30 to 60 days after training. A relationship between partial

transfer and intention to transfer as students finished a training class was not

hypothesized as part of the study. Because similar instruments were used, there are

questions on the reaction survey that could indicate partial intentions to transfer:

- I expect that I will apply some parts of what I learned and not other parts.

- As time passes, I anticipate using varying degrees of what I learned from this
  training.

These two items were significantly correlated with one another. Cronbach's alpha for

the set was .550. When these two were combined to form a partial transfer variable

on the reaction survey, they were added to the regression of intention of transfer onto

organizational support and reaction. The results are summarized in Table 5-1. All

three predictors are significant. Even though it had the highest standard error, the

new partial variable also had the highest beta values and t-score in the model.

Table 5-26. Intention to Transfer Regressed onto Partial Transfer, Reaction to Training, and Organizational Support

Independent

Variable	ΔR^2	B	SE B	β
Reaction	.612	.373	.101	.375*
Org Support	.125	.460	.090	.451*
Partial	.074	.791	.217	.321*

Note. Dependent Variable: Intention to Transfer. The beta values reported were

calculated as part of the third model of a stepwise regression.

*p < .05, two-tailed.

The data indicate that there are portions of the training students do not intend

to transfer. These partial intentions are highly correlated with the learner reactions to

the training (driven by applicability) but not organizational support. Because of the

strength of the relationship between reaction and partial, it can be hypothesized for

future study that that learner intention to transfer only applies to parts of training.

Figure 7 illustrates the proposed theoretical model based on the findings of this

research. It includes the separation of the original partial transfer variable into extent

of transfer, partial transfer, and partial intentions. The proposed model informed the

recommendations for training practices, organizational practices, and research in the

next section.

Figure 7. Proposed Theoretical Model
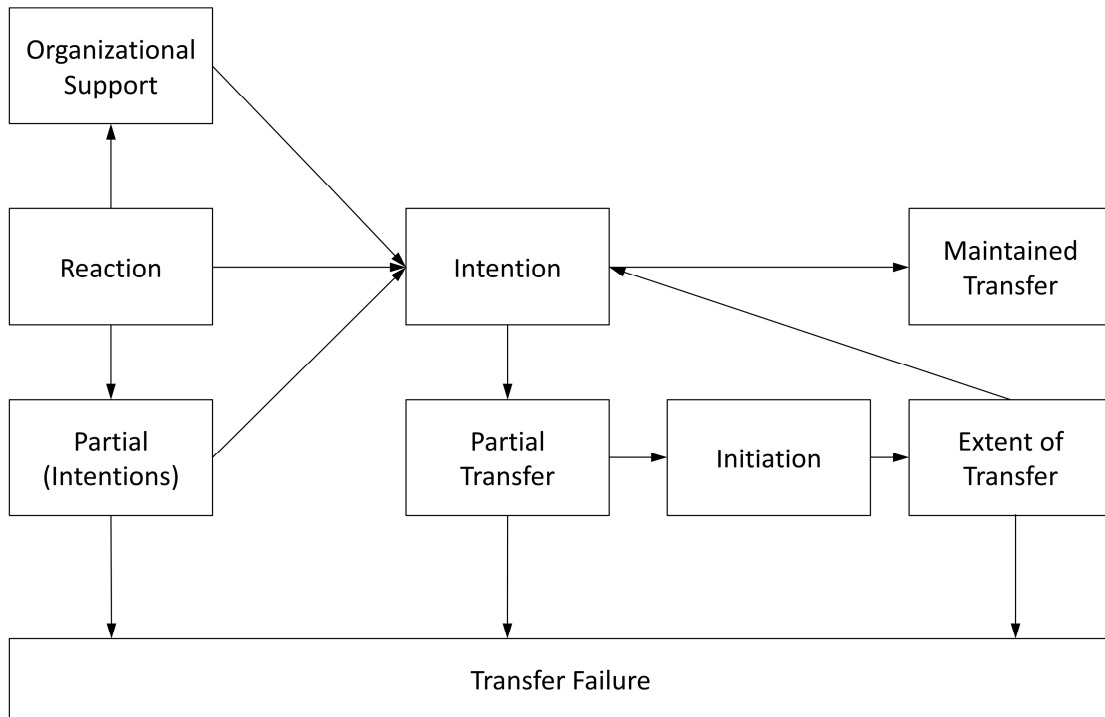
<center>**Recommendations**</center>

The recommendations made as a result of this study are summarized into three

categories. The first is the impact of this study on training practices. The second is the

impact on organizations. Finally, recommendations for additional research are

proposed.

Training Practices.   The results of this study emphasize the importance of

instructional design on the transfer of training. Training is strongly recommended to

be designed for direct applicability to the workplace. Once designed for application,

the learners need to be able to draw the connection between the classroom and their workplace.

Partial transfer is a choice. The choice is made at three separate times in the transfer process. Training practitioners should target these decision points with interventions to increase the likelihood and extent of transfer. Partial intentions can be increased through incorporating into the training design motivational techniques inherent in Adult Learning Theory. Partial transfer can be increased by incorporating post-training performance support, initial application opportunities, and required application on the job to complete the training. Extent of training can be increased through the application of relapse prevention techniques and continued reinforcement of learned behaviors.

Organizational Practices. The results of this study indicate significant areas of improvement for organizations. Organizational support was a significant predictor of transfer even though the supervisors of the organizations in this study did not show evidence of support for the training outside of sending their employees to participate. A pre-training and post-training conversation between supervisor and learner should improve transfer a great deal.

Peer support for the training examined in this study was high. Organizations need to insure that it remains high. Communities of practice, follow-up workshops, and discussion forums related to the training topic can be leveraged to maintain and increase peer support specifically and organizational support in general for transferring training.

Future Research. Transfer of training as a process is a relatively new paradigm.

Processes are characterized by inputs, decision points, and outputs. Continuing to

view transfer as a process could open the transfer of training to process engineering

and improvement methodologies like DMAIC and SIPOC. Research into the application

of these tools to the process of transfer for a given skill would generate large amounts

of data and significantly increase understanding of the transfer process.

This study was limited to the instructor-led training of management and

supervisory skills. There are many other training methodologies: remote instructor-led

training, virtual training, computer-led training, on-the-job training, and self-directed

training (to name several). Because reaction to the training is such a significant

predictor of intention to transfer, learners experiencing training via other modes of

delivery may move through this process differently. There may also be other transfer

of training processes through which learners progress.

The last and most specific recommendation for future research is on the partial

transfer variables. These were proposed as a result of this study. The study was not

intended to quantify three variations of the partial variable. Future research should

include (a) development of measures of these variables, (b) the search for additional

instances of partial transfer, (c) further definition of each instance of partial transfer,

and (d) further definition of partial transfer in terms of the transfer process.

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Appendix A. IRB Exemption

The UNIVERSITY of OKLAHOMA

Institutional Review Board for the Protection of Human Subjects

Approval of Initial Submission – Exempt from IRB Review – AP01

Date: May 28, 2013   **IRB#:** 3179

Principal   Approval Date: 05/24/2013
Investigator: Brent Allen Nowell

Exempt Category: 1

Study Title: The Transfer of Training Process

On behalf of the Institutional Review Board (IRB), I have reviewed the above-referenced research study and determined that it meets the criteria for exemption from IRB review. To view the documents approved for this submission, open this study from the *My Studies* option, go to *Submission History*, go to *Completed Submissions* tab and then click the *Details* icon.

As principal investigator of this research study, you are responsible to:
- Conduct the research study in a manner consistent with the requirements of the IRB and federal regulations 45 CFR 46.
- Request approval from the IRB prior to implementing any/all modifications as changes could affect the exempt status determination.
- Maintain accurate and complete study records for evaluation by the HRPP Quality Improvement Program and, if applicable, inspection by regulatory agencies and/or the study sponsor.
- Notify the IRB at the completion of the project.

If you have questions about this notification or using iRIS, contact the IRB @ 405-325-8110 or irb@ou.edu.

Cordially,

Aimee Franklin, Ph.D.
Chair, Institutional Review Board

Appendix B. Reaction Instrument

Training Assessment

Read each statement. Please select the most appropriate answer.

1. Please enter the name of the course being evaluated:

   _____

2. Please select the delivery method of the training above:

   Instructor-led (Classroom) ☐

   Computer-led (LMS) ☐

3. Final Course Grade (Marks):

   _____

4. What is your highest level of education you have completed?

   High School Diploma ☐

   Associate's Degree ☐

   Bachelor's Degree ☐

   Master's Degree ☐

   Doctorate Degree ☐

5. What is your age?

   _____

6. Gender:

   Male ☐

   Female ☐

Training Assessment

As you respond to the following statements, think of the recent training that you completed. On a scale from zero to five with *0 meaning none at all* and *5 meaning exactly and perfectly*, rate how strongly each statement describes your opinion.

7. The issues were dealt with in as much depth as the length of the course allowed   0   1   2   3   4   5

8. I prefer to learn through the use of a computer rather than in a classroom with others   0   1   2   3   4   5

9. I am motivated to start using what I've learned   0   1   2   3   4   5

10. I will receive feedback at work from my supervisor regarding my application of this training   0   1   2   3   4   5

11. The length of the course was adequate for the objectives and content   0   1   2   3   4   5

12. The training I received was practical and useful for my job   0   1   2   3   4   5

13. I will receive feed back at work from my peers regarding my application of this training   0   1   2   3   4   5

14. I expect that I will apply some parts of what I learned and not other parts   0   1   2   3   4   5

15. The training context/method was well suited to what I needed to learn in this course   0   1   2   3   4   5

16. The practical exercises were a good reflection of my actual work setting   0   1   2   3   4   5

17. This training will result in permanent change in the way I do my job   0   1   2   3   4   5

18. I learn better when taught by a good instructor rather than by a good computer program   0   1   2   3   4   5

19. As time passes, I anticipate using varying degrees of what I learned from this training   0   1   2   3   4   5

20. My colleagues will encourage me to apply what I have learned in this training   0   1   2   3   4   5

21. The training received will be useful for my personal development and career growth   0   1   2   3   4   5

22. I intend to apply this training to my job   0   1   2   3   4   5

23. I will maintain the practices I learned in this training for as long as I have my current job   0   1   2   3   4   5

24. Comments: 0   1   2   3   4   5

_____

_____

Appendix C. Follow-up Instrument

Training Assessment

Read each statement. Please select the most appropriate answer.

1. Please enter the name of the course being evaluated: _____

2. Please select the delivery method of the training above:

    Instructor-led (Classroom) ☐

    Computer-led (LMS) ☐

3. Final Course Grade (Marks): _____

4. What is your highest level of education you have completed?

    High School Diploma ☐

    Associate's Degree ☐

    Bachelor's Degree ☐

    Master's Degree ☐

    Doctorate Degree ☐

5. What is your age? _____

6. Gender:

    Male ☐

    Female ☐

Training Assessment

As you respond to the following statements, think of the recent training that you completed. On a scale from zero to five with *0 meaning none at all* and *5 meaning exactly and perfectly*, rate how strongly each statement describes your opinion.

7. After the training, I began to apply what I learned	0	1	2	3	4	5
8. My supervisor met with me after the training to discuss applying it to my job	0	1	2	3	4	5
9. After the class, I was motivated to start using what I've learned	0	1	2	3	4	5
10. I received feedback at work from my supervisor regarding my application of this training	0	1	2	3	4	5
11. The length of the course was adequate for the objectives and content	0	1	2	3	4	5
12. The training I received was practical and useful for my job	0	1	2	3	4	5
13. I received feed back at work from my peers regarding my application of this training	0	1	2	3	4	5
14. I applied some parts of what I learned and not other parts	0	1	2	3	4	5
15. Initially, I started using the training at work	0	1	2	3	4	5
16. The practical exercises were a good reflection of my actual work setting	0	1	2	3	4	5
17. This training resulted in permanent change in the way I do my job	0	1	2	3	4	5
18. I did not attempt to use the training at work	0	1	2	3	4	5
19. As time passes, I am using less of what I learned from this training	0	1	2	3	4	5
20. My colleagues encouraged me to apply what I learned in this training	0	1	2	3	4	5
21. The training I received has been useful for my personal development and career growth	0	1	2	3	4	5
22. When I finished the class, I intended to apply this training to my job	0	1	2	3	4	5
23. I will maintain the practices I learned in this training for as long as I have my current job	0	1	2	3	4	5

24. Think about the goals and objectives as well as the content of the course you completed. What percentage of that training have you applied at work?

   0%   10%   20%   30%   40%   50%   60%   70%   80%   90%   100%

25. Comments: _____