Factors affecting motivation to transfer training

Dian L. Seyler, Elwood F. Holton III, Reid A. Bates, Michael F. Burnett and Manuel A. Carvalho

This study examines the relationship of motivation to transfer skills and knowledge learned in a computer-based training programme with five groups of variables: individual or general attitudes, situational specific attitudes, reactions, learning, and work environment factors. Hierarchical regression analysis produced a model which explained 60.5% of the variance in motivation to transfer. Individual attitudes and environmental variables explained most of the variance in motivation. A number of mediated relationships were suggested.

Billions of dollars are spent each year on training in an effort to increase productivity so businesses can stay competitive in the face of fierce global competition and a rapidly changing environment[1]. Training is focused on trying to change behaviour or teach new behaviours to individual trainees[2]. However, little is still known about factors that impact on a trainee's decision to use training. From a cognitive perspective of motivation, individuals make behavioural choices based on a combination of factors[3]. Understanding the factors that influence individuals' choices, in particular their choice to use or not use training on the job, would be valuable in determining how to motivate trainees to make behavioural choices that benefit the organisation.

This study focuses on how individual and general attitudes, training situation specific attitudes, reaction, learning and environmental factors affect trainees' motivation to use computer-based training in an industrial setting. Computer-based training, particularly in an industrial setting, has had relatively little attention in the training and development literature. Due to its cost effectiveness and its ability to meet the time demands of shift workers, computer-based training has become a popular deliv-

□ Dian L. Seyler is a private consultant in human resource development, Westerville, Ohio; Elwood F. Holton III is an associate professor of human resource development, Louisiana State University, Baton Rouge; Reid A. Bates is an assistant professor of human resource development in the same University. Michael F. Burnett is Director of the School of Vocational Education, in the same University. Manuel A. Carvalho was Director of Quality Systems at Ciba-Geigy Corporation, St. Gabriel, LA and is now retired.

ery mechanism in a number of industries facing increased training requirements resulting from federal mandates[4].

This research has important theoretical and practical implications. From a theoretical standpoint, a test of key components, mainly outside the training design, in a more comprehensive conceptual framework of training effectiveness gives guidance to future research and theory testing efforts. From a practical standpoint, a better understanding of why some trainees are more motivated to transfer training than others can help focus and improve interventions by (a) guiding needs assessments; (b) aiding in design of new as well as improving the design of existing training programmes; and (c) providing for more thorough training evaluations. All of these factors support the potential for greater learning, transfer of training, and ultimately, improved individual and organisational performance.

The primary purpose of this study then was to empirically and systematically examine a computer-based training (CBT) programme in a field setting to determine the influence of selected variables that are believed to affect trainees' motivation to transfer training.
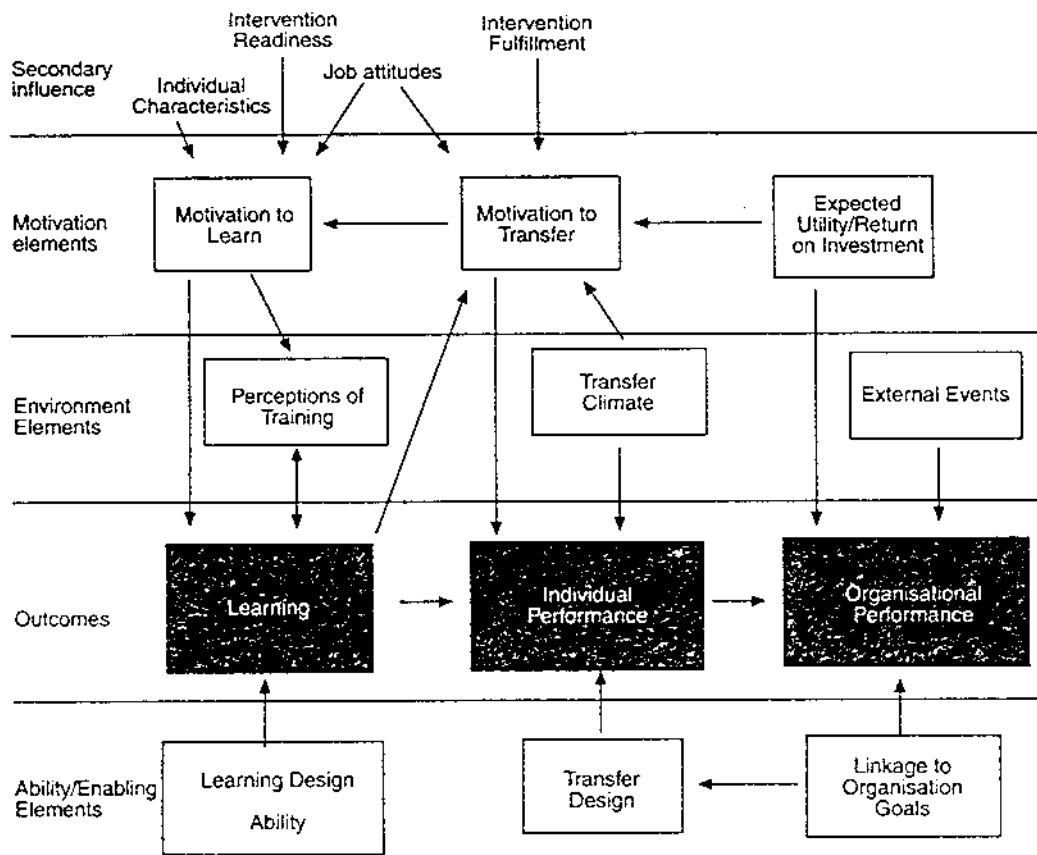
Background literature

Only a few studies have focused primarily on a motivation to transfer. Tannenbaum, Mathieu, Salas, and Cannon-Bowers conducted a study using naval recruit training[5]. They hypothesised that training fulfilment, trainee reactions, and training performance would be related to the development of post-training attitudes. Their findings suggested that trainees' who have more positive reactions to training and who learn more were more likely to have higher post-training motivation. Huczynski and Lewis concluded from their study that issues important to whether or not trainees use their training included: whether or not they attended the course on their own initiative; how helpful they believed the training would be to them on their jobs; and the motivational climate of the organisation, in particular, supervisor support[6]. Baumgartel and Jeanpierre's study of management training found that managers who perceived training as helpful in learning skills and techniques directly related to their job situation were more likely to attempt to use their training when they returned to work[7]. However, organisational climate was the single most important factor affecting efforts to apply new knowledge in the actual job setting.

Facteau, Dobbins, Russell, Ladd and Kudisch developed a training model that incorporated the effects of employees' attitudes and beliefs about training in general on pre-training motivation and perceived training transfer[8]. In a study of management training these researchers found that training attitudes (training reputation and intrinsic incentives); the individual attitude of organisational commitment; and the social support variable, supervisor support, were positively related to pre-training motivation. Their findings further suggested that pre-training motivation, along with subordinate and peer support were positively related to perceived training transfer.

According to Noe, trainees' attitudes, interests, values, and expectations can affect training effectiveness[9]. Noe hypothesised that motivation to transfer moderates the relationship between learning and behaviour change and is influenced by perceptions of work group support and task constraints. Based on this proposition, prior research, and theory, Noe proposed a model of motivational influences on training effectiveness. In Noe's model motivation to transfer moderates the relationship between learning and behaviour change.

Extending some elements of Noe's model, Holton developed the HRD Evaluation Research and Measurement Model (Figure 1)[10]. Holton's model provides a conceptualisation of the holistic approach to determining the effectiveness of training programmes. Holton's model is the first attempt to comprehensively specify antecedent relationships, both direct and indirect, leading to motivation to transfer. Noe's model only specified environmental favourability as influencing motivation to transfer. Thus, Holton's model has the potential to serve as a stronger guide to understanding what influences motivation to transfer.

Figure 1: HRD evaluation research and measurement model (from Holton, 1996)

Construct/definitions

The following section gives a brief definition and background information on the dependent variable (motivation to transfer), and the independent variables or sets of variables included in this research.

Motivation to transfer: positive transfer of training is the application of the knowledge, skills, and attitudes gained in a training context to the trainee's job[11]. In this study motivation to transfer is defined as the intended effort towards utilising the skills and knowledge learned in a training atmosphere to the real world work situation. Locke stated that behavioural choices are regulated by behavioural intentions and considerable evidence supports the hypothesis that intentions are highly correlated with behaviour[12]. Perceived usefulness or performance-utility has been viewed as influencing motivation to transfer and has been used to gauge trainees' motivation to transfer[13]. Therefore, in this study evidence of motivation to transfer is measured by intent to use and perceived performance-utility.

Individual attitudes: individual attitudes are attitudes that the trainee brings to the training programme. They are attitudes that are not directly related to the training programme, but are expected to influence both motivation to learn and motivation to transfer. Individual attitudes included in this study were desire to learn, internal work motivation, and organisational commitment.

Individuals who have a strong desire to learn new things are thought to enjoy the learning process. Both Lawler and Vroom, in their theories of motivation, hypothesised that behaviour is directed towards pleasure and away from pain[14]. Therefore, it would follow that individuals who enjoy learning new things would be more motivated to attend and participate in training and to practise what they have learned.

Although little research has examined the impact of internal work motivation on training effectiveness, internal work motivation has been found to be significantly related to supervisory ratings of job effectiveness[15]. This suggests that if internally motivated individuals are higher performers on the job, then they may view training as a means of improving their performance and, therefore, be more motivated to learn and use training.

Organisational commitment has also been studied mostly in its relationship to job performance. Several studies found correlations between organisational commitment and motivation to perform leading to the proposition that trainees with higher organisational commitment may have greater motivation to transfer than those trainees with lower organisational commitment[16].

Situational variables: situational variables influence motivation to learn under a set of specific circumstances. Computer confidence was included as a situational variable because computer-based training was the delivery method in this study. Computer confidence is related to both computer anxiety and to the concept of self-efficacy, one's beliefs about his/her capability of using the computer. Computer anxiety has been shown to adversely affect the effectiveness of CBT suggesting that such anxiety may undermine individuals' confidence in their ability to learn via computers[17]. Moreover, individuals who see themselves as efficacious in using the computer will expect positive and challenging computer experiences; however, those who view themselves as inefficacious are likely to expect negative experiences with the computer[18].

Training attitudes were also included in this study because favourable or unfavourable attitudes may have developed from past experience in similar training, management attitudes about the training, or peer group influences. Training attitudes have been found to be positively related to pre-training motivation[19]. Training attitudes were shown to be predictive of training success in a diving training course with marines[20]. In addition, research of training attitudes has shown that subjects who received optimistic information about the training programme before participating in the training had more positive outcome expectations, greater motivation to learn, positive reactions to training, greater transfer of learning (self-reported), and more positive post-training attitudes towards using skills presented in the training programme than a group whose pre-training information included some negative information[21].

Reactions to training: once trainees experience training, their attitudes may be altered. Kirkpatrick viewed reaction as an outcome, whereas, Holton viewed reaction as having a moderating role between motivation to learn and learning[22]. Mathieu, Tannenbaum, and Salas found that reaction served as a moderator of the relationship between training motivation and learning, as well as acting as a mediator of other relationships[23].

Two measures of reaction to training are included in this study: reaction to the learning environment and reaction to content validity. Because the training programme in this study was conducted via computers placed in the actual work setting rather than in a traditional classroom, it was of interest to determine if the work setting influenced learning and thus indirectly affected motivation to transfer. Adults are thought to learn best when they have the appropriate levels of light, sound, heat, and cold[24].

Reaction to content validity refers to the trainees' perception of the job relatedness of the training programme. Adult learners are believed to learn best when they can see the relevance of the materials being taught to an immediate need they have[25]. Clement found that trainees' reaction to the relevance of the training material increased learning[26]. Garavagli proposed that the two most likely reasons that learning does not transfer to the job are the work environment is not supportive of the learned behaviour and trainees think the training was irrelevant[27].

Learning: the purpose of the 'learning experience' is for the trainee to gain skills and knowledge and/or for there to be a change in attitudes and beliefs[28]. Tannenbaum et al. found that trainees who scored higher on performance tests during train-

ing had higher post-training motivation[29]. Huczynski and Lewis also reported that motivation to transfer learning was influenced by learning gained[30]. Other researchers have found that transfer behaviour was influenced by the degree of learning gained[31]. Thus, individuals who learn more can be expected to be more motivated to both try to use their learning and to succeed in doing so.

Environmental factors: environmental factors refer to the organisational climate (supervisor support, supervisor sanctions, and peer support) and situational constraints or aids (opportunity to use) of the actual job setting in which the training will be utilised. It is the trainees' perception of the environmental favourability and what he/she expects to encounter in the work setting that influences motivation to transfer. Prior knowledge of the transfer climate into which trainees would return could influence their motivation to learn as well as their motivation to use the training and thus their transfer behaviour[32].

Environmental factors in this study were supervisor support, supervisor sanctions, peer support and opportunity to use the training. Generally support has been found for the influence of supervisors and peers on motivation to transfer[33]. Opportunity to use training as conceptualised in this study includes having all the resources, tools, and information that allow the trainee to use the training as well as being allowed to use the training even if others do not. Mathieu et al. found situational constraints to have a marginally negative effect on training motivation[34]. Higher situational constraints have been associated with lower employee performance[35]. Taken together this research suggests that environmental influences can impact trainees' motivation to transfer training.

Hypotheses

The research hypotheses for this study are stated as follows:

H_1 Desire to learn, internal work motivation, organisational commitment, training attitudes, computer confidence, reaction to the physical learning environment, reaction to content validity, learning, supervisor support, peer support, supervisor sanction, and opportunity to use will each be correlated with motivation to transfer training to the job situation.

H_2 Individual/general attitudes (desire to learn, organisational commitment, and internal work motivation) will explain a significant proportion of the variance in motivation to transfer training to the job situation.

H_3 Situation specific attitudes/motivation to learn (training attitudes and computer confidence) will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by individual/general attitude variables.

H_4 Reaction to training (learning environment and content validity) will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by individual/general attitudes variables and situational specific variables.

H_5 Learning measures will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by individual/general attitude variables, situational specific variables, and reaction variables.

H_6 Environmental factors (peer support, supervisor support, supervisor sanctions, and opportunity to use) will explain a significant proportion of the variance in motivation to transfer after accounting for variance explained by individual/general attitude variables, situational specific variables, reaction variables, and learning.

Methodology

This study was part of a larger project to evaluate a CBT training programme developed to provide training in compliance with Occupational Safety and Health

Administration (OSHA) regulations. The larger project was conducted by an evaluation team, of which the authors were members.

Subjects
Eighty-eight trainees participating in a CBT programme from two units of a large petrochemical company completed the motivation to transfer measure. However, due to missing data the usable sample size was 74.

Measures
Two instruments (Reaction and Transfer Climate) were developed by the researchers for the larger study. Four other previously developed instruments were also used: Computer Attitudes; Self-Directed Learning Readiness Scale; Job Attitudes, which was a combination of 5 scales, and the START instrument[36]. All these instruments had a 5-point answer scale, (1) Strongly disagree to (5) Strongly agree.

Responses to all instruments were factor analysed using a common factor method with oblique rotation. Exploratory common factor analysis is more appropriate than principal components analysis when the objective of the analysis is to identify latent structures, rather than for predictive purposes[37]. Oblique rotation was used because it is also more appropriate for latent variable investigation when the latent variables are expected to have some correlations[38].

To identify instrument sub-scales, factor analyses were performed on all instruments, except the reaction instrument, using the sample from the larger evaluation study (N = 212). The reaction instrument was factor analysed using only those trainees who had actually participated in the CBT (N = 88). The factor analysis produced sub-scales for each instrument. Only those sub-scales applicable to the study were used in this data analysis. Scales used were:

Motivation to transfer—an 8-item scale ($\alpha = 0.89$) derived from a factor analysis of the Reaction Instrument[39]. Examples of the items asked are: "I believe the training will help me do my current job better," and "I plan to use what I learned on the job."

Desire to learn—a 13-item scale derived from Guglielmino's Self-Directed Learning Readiness Scale ($\alpha = 0.91$)[40]. Examples of the items are: "I have a strong desire to learn new things," and "I will never be too old to learn."

Internal work motivation—a 3-item scale ($\alpha = 0.72$), developed by Hackman and Lawler[41]. Examples of the items are: "I feel a great sense of personal satisfaction when I do my job well" and "Doing my job well increases my feelings of self-esteem."

Organisational commitment—an 11-item scale ($\alpha = 0.90$) derived from a factor analysis of the Job attitude Instrument mentioned above. The organisational commitment scale contained 9 items from the Organisational Commitment Questionnaire and 2 items from the Job Satisfaction scale[42]. Examples of the items are: "I really care about the fate of this organisation," and "I find that my values and the organisation's values are very similar."

Computer confidence—a 10-item scale ($\alpha = 0.93$) derived from a factor analysis of a Computer Attitudes instrument developed by Loyd and Gressard[43]. Examples of the items are: "Computers do not scare me at all," and "I have a lot of self-confidence when it comes to working with computer."

Training attitudes—a 7-item scale ($\alpha = 0.82$) derived from a factor analysis of the START instrument[44]. Examples of the items are: "I believe training programmes are important for professional development" and "As long as I get good raises or promotions, I do not care whether or not I participate in training (reverse coded)."

Reaction to the learning environment—a 4-item scale ($\alpha = 0.73$) derived from a factor analysis of the Reaction instrument[45]. Example of the items are: "The setting for the training made it difficult for me to learn (reverse coded)," and "It is generally too noisy in my unit to be able to work on the computer (reverse coded)."

Reaction to content validity—a 3-item scale ($\alpha = 0.74$) derived from the factor analysis of the Transfer Climate Instrument[46]. Examples of the items are: "Skills and knowledge taught in the training are the same skills and knowledge needed to do a good job," and "The standard operating procedures taught in the training are correct."

Supervisor support—a 23-item scale ($\alpha = 0.86$) derived from the factor analysis of

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the Transfer Climate Instrument[47]. Examples of items are: "My advisor meets with me to discuss ways to apply training on the job," and "My supervisor meets regularly with me to work on problems I may be having in trying to use my training."

Supervisor sanctions—a 6-item scale ($\alpha = 0.74$) derived from the factor analysis of the Transfer Climate Instrument[48]. Examples of the items are: "My advisor thinks I am being ineffective when I use the techniques taught in training," and "My adviser doesn't seem to care whether I use my training or not."

Peer support—a 7-item scale ($\alpha = 0.83$) derived from the factor analysis of the Transfer Climate Instrument[49]. Examples of the items used are: "My colleagues encourage me to use the skills I learned in training," and "My colleagues have the technical knowledge to help me use the techniques learned in training."

Opportunity to use—a 5-item scale ($\alpha = 0.86$) derived from the factor analysis of the Transfer Climate Instrument[50]. Examples of items are: "Information describing the procedures taught in training is available to me after training if I need them to complete my work," and "The financial resources are available that will allow me to use skills acquired in training."

Learning was measured by averaging test scores recorded by the computer on tests taken by the trainee at the end of each lesson. These scores could range from 80 to 100 and consist of only those tests taken at the beginning of the CBT until May 15, 1996.

Data collection
The survey instruments were hand delivered to the trainees by the researchers. Instructions were given on how to complete the instruments and participants were assured of anonymity. The instruments were collected immediately after each trainee completed the instrument. The learning scores were obtained from computer generated reports of actual test scores recorded after the participants completed the test at an 80% correct criterion level.

Data analysis
Bivariate correlation analysis was used to test research hypothesis 1. Knowledge of the bivariate relationships between each of the independent variables and the dependent variable aided in the interpretation of the hierarchical regression results and gave a broader picture of the factors that contributed to motivation to transfer.

Hypotheses 2 to 6 were tested using hierarchical multiple regression which partitioned the variance in motivation to transfer that was accounted for by each successive set of variables over and above the influence of the preceding set(s). Thus, the unique portion of the total variance accounted for by each set of variables was estimated by examining the R^2 series and the change in variance explained from one set to another[51]. While a structural equation modeling analysis would have been a more powerful method to use, the sample size in this study was not adequate. When used as an exploratory method of examining relationships between variables, hierarchical regression can suggest the presence of mediated relationships between independent variables and the dependent variable. If the addition of specified causally 'later' variables to the regression model results in coefficients for the causally 'early' variables becoming non-significant, a mediated relationship between the 'early', 'later', and outcome variables is *suggested*[52].

The order of entry was based on the conceptual model from Holton's HRD Evaluation Research and Measurement Model and the logical sequence of these variables or sets of variables as they appear in the training situation[53]. The order of entry (see Figure 2) was as follows: (1) desire to learn, internal work motivation, and organisational commitment; (2) computer confidence and attitudes towards training; (3) reaction to learning environment and reaction to content validity; (4) learning; and (5) supervisor support, supervisor sanctions, peer support, and opportunity to use.

Results

Hypothesis 1
Bivariate correlation analysis revealed that all correlations were statistically signifi-
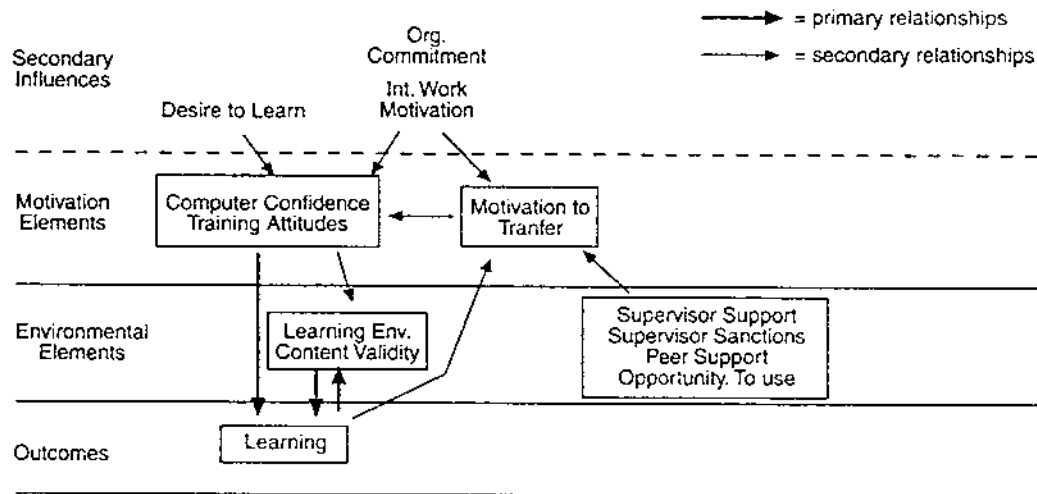
Figure 2: Conceptual model for motivation to transfer (from Holton, 1996)

cant except for internal work motivation and learning. The largest correlations with motivation to transfer were opportunity to perform (r = 0.58), peer support (r = 0.54), organisational commitment (r = 0.41), supervisor sanctions (r = −0.396), and computer confidence (r = 0.391). Table 1 gives complete information on the correlations of the independent variables with motivation to transfer.

Hypotheses 2–6
Tests for violations of regression assumptions were all negative, indicating that the data were appropriate for regression analysis. Hierarchical regression analysis results (see Table 2) yielded the following results.

Hypothesis 2: In step 1 of the regression analysis the individual/general attitudes (desire to learn, organisational commitment, and internal work motivation) were entered as a group. The model was significant (p ≤ 0.001) with an R^2 of 0.198, indicating that almost 20% of the variance in motivation to transfer was explained by these attitudes. Only organisational commitment was a significant predictor ($\beta = 0.412$, p. ≤ 0.01).

Table 1: Pearson correlation coefficients for bivariate relationships between motivation to transfer and independent variables

Variables	N	Motivation to Transfer r
Computer confidence	74	0.391***
Internal work motivation	74	0.179
Organisational commitment	74	0.410***
Desire to learn	74	0.327**
Training attitudes	74	0.346***
Reaction—learning environment	74	0.247*
Reaction—content validity	74	0.238*
Learning average	74	0.103
Opportunity to perform	74	0.580***
Peer support	74	0.544***
Supervisor support	74	0.397***
Supervisor sanctions	74	−0.396***

*p ≤ 0.05 (one-tailed) **p ≤ 0.01 (one-tailed) ***p ≤ 0.001 (one-tailed) level
Note: One-tail test used for significance

Table 2: Results of hierarchical regression analysis for motivation to transfer

Variable	β	R^2	Adj. R^2	F/df	ΔR^2	F/df
Model 1		0.198	0.164	5.771*** (3.70)		
Org. Commitment	0.412**					
Desire to Learn	0.196					
Internal Work Mot.	−0.194					
Model 2		0.262	0.208	4.832*** (5.68)	0.064	2.943 (2.68)
Org. Commitment	0.366**					
Desire to Learn	0.007					
Internal Work Mot.	−0.262					
Training Attitudes	0.205					
Computer Confid.	0.219					
Model 3		0.317	0.244	4.367*** (7.66)	0.054	2.627 (2.66)
Org. Commitment	0.272*					
Desire to Learn	0.005					
Internal Work Mot.	−0.213					
Training Attitudes	0.224*					
Computer Confid.	0.195					
Reaction-Lrn. Env.	0.192*					
Reaction-Cont. Val.	0.169					
Model 4		0.341	0.260	4.204*** (8.65) =	0.024	2.408 (1.65)
Org. Commitment	0.247					
Desire to Learn	0.021					
Internal Work Mot.	−0.214					
Training Attitudes	0.215					
Computer Confid.	0.191					
Reaction-Lrn. Env.	0.231*					
Reaction-Cont. Val.	0.201*					
Learning Avg.	0.164					
Model 5		0.605	0.527	7.781*** (12.61)	0.264	10.184*** (4.61)
Org. Commitment	0.079					
Desire to Learn	−0.078					
Internal Work Mot.	−0.188					
Training Attitudes	0.052					
Computer Confid.	0.358**					
Reaction-Lrn. Env.	0.118					
Reaction-Cont. Val.	0.077					
Learning Avg.	0.098					
Opportunity to Use	0.379***					
Peer Support	0.315**					
Superv. Sanctions	−0.179*					
Superv. Support	−0.115					

*$p \leq 0.05$ (one-tailed) **$p \leq 0.01$ (one-tailed) ***$p \leq 0.001$ (one-tailed) level

Hypothesis 3: Step 2 of the regression analysis added the training specific attitudes (computer confidence and training attitudes) to the model. The model was significant (p ≤ 0.01) and the R^2 increased slightly to 0.262. However, the increase was not statistically significant. Neither of the variables entered in step 2 (training attitudes nor computer confidence) were significant predictors of motivation to transfer. Organisational commitment remained a significant predictor, but its standardised beta decreased to 0.366.

Hypothesis 4: Step 3 of the regression analysis added the reaction variables to the model. The model was significant (p ≤ 0.001) with an R^2 of 0.317, which was a slight but non-significant increase over the previous model. Reaction to the learning environment was a significant predictor ($\beta = 0.192$, $p ≤ 0.05$). Organisational commitment remained a significant predictor ($p ≤ 0.05$) but its standardised beta decreased further ($\beta = 0.272$). Training attitudes became a significant predictor ($\beta = 0.224$, $p ≤ 0.05$) in step 3.

Hypothesis 5: Step 4 of the regression analysis added the learning average to the model. The model remained significant (p ≤ 0.001), with a slight but non-significant increase in R^2 ($R^2 = 0.341$). Learning was not a significant predictor of motivation to transfer. Reaction to the learning environment ($\beta = 0.231$) and reaction to content validity ($\beta = 0.201$) each were significant predictors of motivation to transfer (p ≤ 0.05). Organisational commitment became marginally nonsignificant ($p = 0.051$, $\beta = 0.247$). Training attitudes were not a significent predictor after the addition of the learning variable.

Hypothesis 6: Step 5 of the regression analysis added the environmental variables (opportunity to use, peer support, supervisor sanctions, supervisor support). The final model was significant (p ≤ 0.001). With the addition of the environmental variables, R^2 increased to 0.605, which was a significant increase (p ≤ 0.001) over the previous model. The significant predictor variables in the final model were computer confidence ($\beta = 0.358$, $p ≤ 0.01$), opportunity to use ($\beta = 0.379$, $p ≤ 0.01$), peer support ($\beta = 0.315$, $p ≤ 0.01$) and supervisor sanctions ($\beta = -0.179$, $p ≤ 0.05$). Supervisor support was not a significant predictor of motivation to transfer.

Discussion

The most important finding to emerge in this study was that environmental factors (opportunity to use, peer support, supervisor sanctions, and supervisor support) explained a large amount of variance in motivation to transfer. The addition of this group of variables in the fifth and final step of the hierarchical regression increased the R^2 significantly, explaining an additional 26.4% of the variance in motivation to transfer over the previous model ($R^2 = 0.605$, adjusted $R^2 = 0.527$). This finding is consistent with research linking environmental influences to transfer of training and subsequent changes in performance[54]. The present study extends these findings by showing that environmental variables have a broader influence affecting not only post-training behaviour, but motivation to transfer as well.

The standardised betas in the final model indicated that opportunity to use ($\beta = 0.379$) had the strongest influence on motivation followed by computer confidence ($\beta = 0.358$), peer support ($\beta = 0.315$), and supervisory sanctions ($\beta = -0.179$). In the final model, the only environmental variable that failed to emerge as a significant predictor of motivation to transfer was supervisor support. Supervisor support was significantly correlated with motivation to transfer (r = 0.397) although not as strongly as opportunity to use and peer support (r = 0.580 and 0.544 respectively). In addition, supervisor support was significantly correlated with the other 3 environmental variables entered simultaneously with it in the regression analysis. It is possible that little unique variance was left to be explained by supervisor support after accounting for the influence of the other environmental variables. The fact that peer support had a significant influence and supervisor support did not may also be a function of the cohesiveness of the work group in this industrial setting. In a less

cohesive setting, supervisor support might exert a stronger influence than peer support; however, further research is needed to determine if this would be true.

It is interesting to note that none of the predictor sets entered in the regression model after organisational commitment (step 1) explained significant increments in variance until the environmental variables entered. Thus, neither situation specific attitudes (computer confidence and training attitudes), learning, or reactions to training (reaction to the learning environment and reaction to content validity) explained significant increments in motivation to transfer variance. This suggests that motivation to transfer is largely a function of organisational commitment and transfer environment.

However, the pattern of changes in significant predictor variables in the regression models suggests the possibility of certain other relationships. First, organisational commitment remained a significant predictor, though with declining influence, until the reaction variables entered the model. This suggests that the reaction variables and situational variables (eg. training attitudes) together fully mediate the relationship between organisational commitment and motivation to transfer. This follows logically because trainees enter training with some level of commitment based on their basic attitude towards the organisation, which is then altered based on their specific attitude towards the training and their reaction to the training itself. However, with the addition of environmental variables, the situational attitudes and reaction to training became non-significant predictors, suggesting that environmental variables fully mediate these training specific variables.

These results point to the possibility that motivation to transfer is a product of basic commitment to the organisation, mediated by attitudes toward and reactions to the specific training, which is further mediated by the transfer environment, specifically opportunity to use, peer support and supervisor sanctions (see Figure 3).
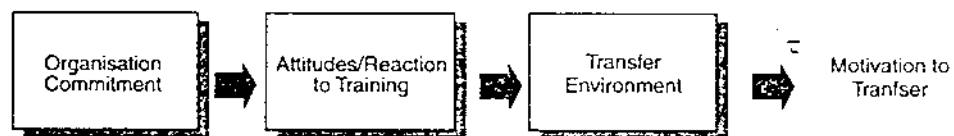

Figure 3: Suggested mediated relationships

Learning was not significantly correlated with motivation to transfer and it was not a significant predictor variable in the regression analysis. The lack of findings related to learning may be a function of the way learning was measured. The researchers were not given the opportunity to develop or audit the tests to assure content validity. In addition the learning measure was range restricted. Thus, although the learning measure was based on tests created by subject matter experts, there was no assurance that tests were comprehensive or representative measures of the learning that took place during the training. Also, trainees were allowed to take the test as many times as needed to satisfy the 80% correct criterion for the mandated certification. Therefore, there was little variability in the learning score (mean = 94.21, SD = 2.30). Due to the learning measurement problems, the findings regarding the role of learning on motivation to transfer are suspect.

Computer confidence did not follow the expected path of influence. Instead of being a significant predictor in the model when first entered and then becoming a non-significant predictor after the learning variable was entered (due to the expected mediating influence of the learning variable), computer confidence did not become a significant predictor of motivation to transfer until the final model with the entry of the environmental variables. This suggests that computer confidence was not mediated by learning. However, computer confidence may have been moderated by the environmental variables or an unspecified variable that shared variance with both computer confidence and the environmental variables. In the field setting for this study, trainees used computers as a method of training delivery, as well as for their day-to-day jobs. Thus, computer confidence may have been related to their confi-

dence in their ability to use the training back on the jobs. Also, the computer confidence instrument used in this study is a general measure of computer confidence and did not contain items specific enough to be able to distinguish between confidence in using computers to access and utilise the training programmes and computer confidence in using computers to perform their day-to-day jobs. Further research is needed, using a measure that specifically assesses computer confidence related to training delivered by computer, to clarify the role of computer confidence in influencing motivation to transfer training.

Taken together these findings lend a measure of support to Holton's comprehensive model of training evaluation. The findings suggest that individual attitudes and personality characteristics can influence a person's motivation to transfer training, as proposed by Holton and suggested by Noe[55]. Support was also found for a direct influence of transfer climate on motivation to transfer. The use of hierarchical regression allowed the influence of 'early' entry variables (eg., organisational commitment) to be seen and gave indications of possible moderated and mediated relationships[56]. These findings deviated somewhat from the conceptual model in that the environmental variables not only had a direct influence on motivation to transfer, but, also served as mediator variables between other variables and motivation to transfer. This suggests that even though motivation to transfer may be influenced earlier in the training process by such variables as organisational commitment, training attitudes, and reaction to the training, the trainees' perceptions of the environment in which they will actually be using the training can strengthen or weaken the influence of these variables on motivation to transfer. This study points to the need for examining training from a process point of view, looking at antecedents to key variables and outcomes of the training process through comprehensive training models.

Limitations

This research has several limiting factors. The independent variables and the dependent variable were collected from the same source. However, examination of the correlation matrix indicated a wide range of correlations among the independent variables and the dependent variable ($r = 0.179$ for internal work motivation and $r = 0.580$ for opportunity to use). The data for this study were collected from a purposive sample of two work units at one plant site so the findings should be generalised with caution. Tests to determine learning scores were created by the design team at the plant site and were not available a priori for content validation, therefore, content validity of test cannot be assured. Although respondents were assured of confidentiality, they were required to put their name on each of the survey instruments in order for the researcher to link data from each of the instruments and learning scores together for data analysis. Fear of having their responses seen by their employer/supervisor may have caused some respondents to answer in a manner that would be more acceptable to their employer/supervisor. Due to logistic considerations of conducting research in a field setting, pre-tests were not performed so learning cannot be directly attributed to the training. Due to the nature of the field study, access to a control group was not possible, therefore; no comparisons can be made regarding computer based training and traditional training programmes. None of these limitations were believed to have seriously compromised the quality of the study.

Implications for practice

This study has a number of important implications for practice:

1. Perceptions of environmental factors were found to have strong influences on motivation to transfer and possibly to mediate the effect of the reaction variables. Supervisor sanctions had a negative influence and peer support had a positive

influence on motivation to transfer, thus care should be taken to gain support for training both from trainees, peers, and supervisors prior to training. Reliable measures of transfer climate need to be developed to assess the favourability of the transfer climate within organisations prior to conducting the training. Care should also be taken to provide the necessary information, tools, and resources, as well as to minimise constraints to the use of performing on the job as taught in training.

2. Training attitudes about subsequent training may be influenced by prior situations in which the use of training was constrained by supervisor's and peer's lack of support for the training or by the lack of the necessary information tools and resources to perform as taught in the training programme. Thus, the general reputation and credibility of the training system is an important factor to consider.

3. The findings related to the influence of computer confidence on motivation to transfer, suggest providing trainees with an opportunity to build confidence in their computer skills may increase motivation to transfer when computers are used as the delivery method. This finding points to the need for further research to determine if user confidence needs to be established when other new methods of delivery are introduced.

4. Although not significant predictors in the final model, organisational commitment, training attitudes, reaction to the learning environment and reaction to the content validity were significant predictors in earlier models and were each significantly correlated with motivation to transfer. This suggests that attention should be given to these areas. While the learning environment and content validity of training materials are part of the training design, this study points to the need to consider, not only the training design, but also the influence of attitudes and perceptions that the trainee brings with them to the training programme.

5. Before training design begins needs assessments should be conducted that incorporate measures of variables that may influence motivation to learn and motivation to transfer training, such as organisational commitment, training attitudes, computer confidence, and perceptions of the transfer environment. By knowing prior to the training design where weaknesses in the process are, actions can be taken improve the effectiveness of the training programme.

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