Assessing the antecedents of transfer intentions in a training context

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Running Head: ASSESSING THE ANTECEDENTS OF TRANSFER

Word count: 7,960

Abstract

This study examined the underlying structure of transfer climate and those aspects of transfer climate that were related to pre-training self-efficacy, pre-training motivation, and post-training transfer implementation intentions. Positive and negative affectivity (PA and NA) were also measured in order to better understand the relationship of these variables to trainees' perceptions of the transfer climate and the other training-related variables. Transfer climate was best represented by two underlying constructs, although these were correlated. After controlling for PA and NA, none of the transfer climate variables were significantly related to pre-training self-efficacy, while only positive reinforcement was significantly related to pre-training motivation. Pre-training self-efficacy was also a significant predictor of pre-training motivation, even after controlling for PA and NA. Negative Affectivity was the only significant predictor of post-training transfer implementation intentions. Further research needs to clarify whether PA and NA are contributors to the trainees' perceptions of the transfer climate or are a product of these perceptions.

Key words: transfer climate, self-efficacy, motivation, positive affectivity, negative affectivity, transfer implementation intentions.

Assessing the antecedents of transfer intentions in a training context

Transfer climate is a generic construct that has been used to describe those aspects of the work environment that directly influence the generalisation and maintenance of knowledge and skills learned during training (Rouiller & Goldstein, 1993). These authors proposed a model of the transfer climate based on social learning theory. The model featured two broad categories of antecedents and consequences: antecedents, or situational cues, serve to remind trainees of their training or provide them with opportunities to use their training, whereas consequences affect the likelihood that trainees will continue to use their skills. Rouiller and Goldstein found that these two major components of transfer climate accounted for significant unique variance in transfer of training. The present study set out to examine the structure of a measure designed to capture these two transfer climate constructs and to determine whether they have a direct influence on transfer motivation and transfer intentions or whether this influence is potentially mediated by other constructs such as self-efficacy and affectivity. We begin by tracing recent developments in the conceptualization of the construct of transfer climate and reviewing competing accounts of how it influences transfer intentions and behaviors.

Baldwin and Ford (1988) proposed a model of training transfer wherein the transfer climate construct included a range of characteristics of the work environment such as support from one's supervisor and peers for transfer of learning, situational constraints, and opportunity to use one's knowledge and skills on the job. In addition to environmental factors, Baldwin and Ford's (1988) model included two other kinds of training input factors, the design of training and characteristics of the trainee. All three

training input factors were viewed as directly affecting the training outputs of learning and retention, which in turn influenced the conditions of transfer.

Thayer and Teachout (1995) developed a model of the transfer process that portrayed the climate for transfer of training and the transfer-enhancing activities that occur during the training program as influencing the training and transfer outcomes (see Figure 1). The climate for transfer part of Thayer and Teachout's model was directly based on Rouiller and Goldstein's (1993) two-component model. Thayer and Teachout subsequently created the Climate for Transfer Questionnaire (CTQ) to assess the two main components of transfer climate. They incorporated many of the items from Rouiller and Goldstein's questionnaire, plus additional items they developed themselves. One category of items in Rouiller and Goldstein's model (self-control cues) was omitted from the CTQ and incorporated into a second questionnaire called the Transfer-Enhancing Activities Questionnaire (TEAQ). The current study sought to initially validate the hypothesized dual nature of transfer climate using the six subscales contained in Thayer and Teachout's CTQ (goal cues, social cues, task cues, positive reinforcement, negative reinforcement [and punishment], and extinction). We expected that the six subscales of the CTQ would all be positively correlated and that the correlations between each subset of scales (that is, between the three "antecedent" scales and the three "consequences" scales) would be greater than the correlations between scales that were in different groups. In other words, there should be two distinct, but related factors. This proposed structure has not been demonstrated by previous research.

Most researchers have assessed specific facets of the organisation's climate for transfer of training. For example, Orpen (1999) separately measured social support at

work and outside of work, training incentives (similar to the perceived value of training), and the degree to which the trainees' employers provided five types of training resources (time, money, equipment, facilities, and opportunities). Lim and Johnson (2002) identified the factors in the work environment that influenced transfer of learning and asked trainees to rate their impact. They separated the work environment into two kinds of factors: organisational-level factors (such as organizational commitment for training, and whether the goals of the department matched with new learning) and individual-level factors (such as whether discussions occurred with their supervisor to use new learning, and whether the supervisor was involved in or familiar with the training).

Tracey, Tannenbaum and Kavanagh (1995) attempted to replicate and expand on the work of Rouiller and Goldstein (1993) by evaluating transfer of training among supermarket managers using separate measures of transfer climate and continuous-learning culture. Both transfer climate and continuous-learning culture were directly related to post-training behaviours, even after accounting for pre-training performance and knowledge learned during training. Tracey et al. found that the social support components in both the climate and culture measured had the strongest relationships with the underlying constructs being measured. This indicates that the extent to which supervisors and coworkers encourage the learning and use of trained skills on the job may be the crucial elements in the transfer environment, a conclusion supported Foxon (1997) but disputed by van der Klink, Gielen and Nauta (2001).

One common feature of the research to date has been that all models discussed to this point were essentially proposing a direct effect of transfer climate on transfer of learning subsequent to training. The models to be discussed next all involve transfer

climate operating through mediated pathways. Mathieu and Martineau (1997) suggested

that environmental constraints operate to decrease transfer through two mechanisms.

Firstly, by influencing trainees' opportunities to perform their trained tasks and through

the level of support and encouragement they receive from supervisors and coworkers.

The second pathway is by indirectly influencing training and transfer outcomes via the

trainee's level of pre-training motivation. In this way, environmental constraints are

seen as exerting both a direct and an indirect influence on transfer success. Quiñones

(1997) supported the idea that transfer climate affects training outcomes and transfer

through its effect on individual variables such as trainees' motivation and self-efficacy.

Colquitt, LePine and Noe (2000) in their meta-analysis of the antecedents and outcomes

of training motivation also found support for both a direct and indirect influence of the

transfer climate on transfer of training.

　　　Tracey, Hinkin, Tannenbaum and Mathieu (2001) tested a model that linked

individual and organisational factors related to trainees' preparedness for training with

two training effectiveness measures: reactions and learning. Pre-training self-efficacy

and pre-training motivation were treated as endogenous variables that mediated the

relationship between several exogenous variables (job involvement, organisational

commitment, and work environment) and the two types of outcomes (reactions and

learning). Work environment was found to be directly linked to both pre-training self-

efficacy and pre-training motivation, while pre-training self-efficacy also mediated the

relationship between the work environment and pre-training motivation.

　　　These latter models therefore retain the construct of transfer climate but

introduce the constructs of motivation and self-efficacy as mediators of the influence of

climate on transfer intentions and transfer behaviors. In so doing, they focus attention

on the relations among the constructs that precede the actual training and the transfer

intentions that are formed at the end of the training experience. The present study

continues in that tradition. The first model to be tested concerned the relationship of the

CTQ subscales with pre-training measures of self-efficacy and motivation. It was

expected that self-efficacy would mediate the relationship between each of the transfer

climate scales and pre-training motivation. The second model focused on the

relationship between transfer climate and the trainees' implementation intentions that

they reported at the end of training.

This second model introduces another modification to the Thayer and Teachout

(1995) model by proposing that trainees develop specific implementations at the end of

training to guide their subsequent behaviour at work. Gollwitzer (1993) proposed that

there are two kinds of intentions that impact on goal achievement: goal intentions and

implementation intentions. Goal intentions were defined as specifying a desired end

state, as well as some level of commitment to achieving that end state. Implementation

intentions were defined as specifying the situational cues or conditions that trigger goal-

directed actions. That is, this kind of intention is a commitment to act in a certain way

whenever certain conditions are fulfilled. Implementation intentions were regarded as

instrumental in making salient to the individual the aspects of the environment that were

relevant to the achievement of their goals. The kinds of implementation intentions that

are relevant to the transfer of training are likely to be intentions to use the transfer

enhancement procedures such as goal setting, self management, and relapse prevention

that are effective in promoting the transfer process (Haccoun & Saks, 1998). Other

activities that might promote transfer include seeking support from supervisors and

peers, as well as practicing the skills learnt in training, and looking for opportunities to

demonstrate the skills learnt during training. Therefore, a measure of implementation intentions that included all of the above activities was included in this study as one of the important outcomes of training. It is expected that the social support subscale of the CTQ will be more strongly related to transfer implementation intentions than any of the other CTQ subscales confirming the importance of social factors in the work environment.

Controlling for the influence of positive and negative affect

Tellegen (1985) suggested that there may be a strong link between variables such as positive and negative affectivity (PA and NA respectively) and employees' sensitivity to signals of reward and punishment in the workplace. In particular, NA has been found to have a direct influence on self-reports of strain, as well as a moderating and confounding effect (Burke, Brief & George, 1993; Moyle, 1995). Spector, Zapf, Chen and Frese (2000) argued that rather than attempt to control for any biasing effect of NA by including items with a lower affective tone, or by partialing out the influence of NA, researchers should examine whether NA may have an important substantive role to play in the job stress process. For example, NA may be an outcome of negative events occurring in the workplace, and thereby become a mediator of the influence of workplace climate on individual variables such as self-efficacy, and motivation. Positive Affectivity may play a similar role, but there is less research to support this notion.

A recent meta-analysis of the research linking trait and state measures of PA and NA to job-related attitudes (Thoresen, Kaplan, Barsky, Warren & de Chermont, 2003) has confirmed that both PA and NA contribute unique variance to the prediction of each of the job-related variables (job satisfaction, organisational commitment, turnover

intentions, and dimensions of job burnout). One explanation offered by these authors for the role of PA and NA is that both types of affectivity influence how individuals appraise their work environment and that these appraisals influence job attitudes. If PA and NA do influence job-related attitudes through the appraisal of the work environment, there is a strong argument for including both PA and NA in studies assessing the impact of individual's perceptions of the transfer climate on their self-efficacy, motivation, and transfer implementation intentions. The present study will attempt to define the interrelationships among these variables and, in particular, the nature of the relationship between aspects of transfer climate and self-efficacy, motivation, and transfer implementation intentions after controlling for PA and NA.

Summary of research aims and hypotheses

The first research question involved assessing the dimensionality of the CTQ which assesses six aspects of the transfer climate, three "antecedents" and three "consequences" of transfer of learning. A secondary part of this issue related to the relationships of both positive and negative affect to the trainee's perceptions of the transfer climate. We will assess these relationships by examining the correlations between the affect and transfer climate measures and by factor analysing just the transfer climate scale totals, and then all of the scale totals (that is, not at the item level). This will reveal whether different transfer climate subscales load with PA than with NA. The specific hypothesis was that the six subscales of the Climate for Transfer Questionnaire (Thayer & Teachout, 1995) represented two underlying constructs as suggested by Rouiller and Goldstein (1993). The measures of goal cues, social cues, and task cues would load on the "Antecedents" construct, while the measures of positive reinforcement, negative reinforcement (and punishment), and extinction would load on

the "Consequences" construct. The measures of PA and NA were included to assess which of the CTQ scales loaded with each of these variables.

A second question involved determining the degree to which separate dimensions of the transfer climate were able to predict trainees' pre-training self-efficacy and motivation. It was expected that pre-training self-efficacy would mediate the relationship between each of the transfer climate scales and pre-training motivation. The specific hypothesis was that the six transfer climate variables would be positively related to pre-training self-efficacy and motivation. This hypothesis was based on the work of Mathieu and Martineau (1997), Quiñones (1997), and Tracey et al. (2001), which suggested that trainees' perceptions of their environment would be positively linked to their pre-training self-efficacy and pre-training motivation, and that pre-training self-efficacy would also mediate the link between transfer climate and pre-training motivation. The influence of PA and NA was controlled for by entering these variables into a hierarchical regression prior to the transfer climate subscales.

A third question related to the relationships between the transfer climate subscales and level of post-training transfer implementation intentions. It was expected that the social support subscale would be the strongest predictor of transfer intentions, even after controlling for PA and NA. The specific hypothesis was that the six transfer climate variables would be positively related to post-training transfer implementation intentions and that, in line with Tracey et al. (1995), social cues would be the strongest predictor of transfer implementation intentions. Once again, the influence of PA and NA was controlled for by entering these variables into a hierarchical regression prior to the transfer climate subscales.

While there are several other possible questions that could be addressed relating to the influence of post-training self-efficacy, learning outcomes, and in-training transfer enhancing activities on transfer implementation intentions, these have been reported separately (Machin & Fogarty, 2003).

Method

Participants

The participants in the study were members of the Queensland Police Service who were undertaking advanced (Level 3) training for a computerised information system (POLARIS). The participants were recruited from the 30 Police Districts in Queensland and were all experienced in the use of computers in police work. The trainees subsequently assumed overall responsibility for the training of POLARIS within their Police District. There were 137 trainees who attended one of nine Level 3 training courses. Eighty-nine trainees (65%) completed the Pre-training Questionnaire, while 104 trainees (76%) completed the Post-training Questionnaire, and a further 49 trainees (36%) completed the Follow-up Questionnaire. The data for this study were contained in the Pre-training Questionnaire and the Post-training Questionnaire. As explained above, only hypotheses concerning the structure and validity of the CTQ were examined in this study. Other issues relating to different aspects of Thayer and Teachout's (1995) model were examined elsewhere (Machin & Fogarty, 2003).

Demographic data were available for 85 of the trainees who completed the Pre-training Questionnaire. Most of the Level 3 trainees (82%) were sworn QPS staff. Sworn staff were from the ranks of Constable ($N = 11$), Senior Constable ($N = 32$), Sergeant ($N = 26$) and Senior Sergeant ($N = 2$), while the unsworn staff were employed as either an Administrative Services Officer Level 1 (ASO1; $N = 1$), ASO2 ($N = 8$),

ASO3 ($N = 5$) or Professional Officer Level 2 (PO2; $N = 1$). The reason for fewer

trainees completing the Pre-training Questionnaire was that it was mailed out prior to

the training commencing. The training course attendance lists were not always accurate

and substitutions occurred at the last minute with the substitutes not having had an

opportunity to complete the Pre-training Questionnaire. Other participants simply did

not complete the Pre-training Questionnaire due to it not being perceived as a high

priority.

Description of the Pre-training Questionnaire

The Pre-training Questionnaire contained a number of measures that were not

part of the hypotheses being tested. Some of these variables were included to provide

feedback to the trainers, while others have been reported in a related research project

(see Machin & Fogarty, 2003). To conserve space, these variables will not be described

again. All items employed a seven-point Likert-type scale with the response options

ranging from 1 (strong disagreement) to 7 (strong agreement). The average response to

the Likert-type scale items was calculated for each of the following variables.

Positive and negative affect were measured using the 20-item Positive and

Negative Affect Schedule (PANAS: Watson, Clark & Tellegen, 1988) that contains 10

items which are markers of positive affect (PA) and 10 items which mark negative

affect (NA). Markers of PA include "I feel interested", and "I feel excited", while

markers of NA include items such as "I feel distressed" and "I feel hostile". There is

considerable debate over the stability of affectivity, with state affect referring to

momentary experiences of emotion, and trait affect (i.e., affectivity) representing the

dispositional tendency to experience prolonged levels of emotion (Thorensen, et al.,

2003). The instructions used for the current study asked respondents to indicate the

extent to which, on average, they have felt this way over the last three weeks. We regarded this time frame as most appropriate in that it allows enduring emotions to be reported without requiring that the participants report on more distant and less accessible experiences. Scores for each set of 10 items were totalled to provide an indicator of each person's level of PA and NA. Higher scores indicate a higher level of affectivity.

Pre-training self-efficacy was measured using 12 items developed for this study. Bandura (1997) has defined three dimensions to self-efficacy: magnitude (or level), strength, and generality. Bandura recommended that researchers follow a standard format for assessing self-efficacy that requires individuals to rate the strength of their belief in being able to perform a set of activities that are ordered in an increasing level of difficulty. In one format, the individual first judges whether or not they can perform a task and then, for the tasks that they judged they can do, they rate the strength of their belief. Bandura also describes a second format that simply asks individuals to rate the strength of their self-efficacy using a single-judgement format that pertains to every item in the activity domain. This latter type of format is somewhat simpler to complete but was found to be less predictive of behavioural outcomes and only weakly related to composite measures of efficacy to fulfill graded task demands (Lee & Bobko, 1994).

Maurer and Pierce (1998) have also compared a Likert-type measurement format with a traditional format for measuring self-efficacy. They found that the Likert-type format demonstrated similar levels of reliability, provided equivalent levels of predictive validity, and had a similar factor structure and discriminability. They concluded that a Likert-type scale seems to offer an acceptable alternative method to measure self-efficacy. Therefore, a Likert-type response format was adopted for this

study. An example of one item was "I am confident that I can perform satisfactorily during training".

Pre-training motivation was measured using nine items developed for this study which assessed the trainees' intensity of desire to acquire new skills (including five items covering their commitment to learning, the level of effort they were willing to expend, the importance to them of performing satisfactorily, their anticipated satisfaction, and the perceived usefulness of the course) and their intentions to acquire new skills during training (including four items measuring their aim to master the required skills and develop their expertise). For example: "I aim to master all of the required skills during training".

Climate for Transfer Questionnaire (CTQ: Thayer & Teachout, 1995). This questionnaire contained 56 items grouped into six subscales based on Rouiller and Goldstein's (1993) transfer climate factors.

1. Goal Cues containing six items such as "Supervisors meet with employees to set goals following training".

2. Social Cues with 10 items such as "Supervisors meet regularly with employees when they arrive from training to work on problems they may have in trying to use their training".

3. Task Cues containing 10 items such as "There is never enough time to do the job the way we are taught in training".

4. Positive Reinforcement containing 10 items such as "Supervisors praise employees when they use their training".

5. Negative Reinforcement and Punishment (shortened to Negative Reinforcement hereafter) containing 10 items such as "When employees fail to use their training,

they can expect to be reprimanded".

6. *Extinction* containing 10 items such as "Supervisors pay only lip service to the value and usefulness of training".

Description of the Post-Training Questionnaire

The only variable that was contained in the Post-Training Questionnaire of relevance to this study was *Transfer Implementation Intentions*. Eleven items were developed specifically for this study to assess the trainees' intention to engage in specific behaviour that would facilitate transfer of their skills. The three main areas that were targeted in the development of items as being crucial in promoting skills transfer were goal setting, self-management, and relapse prevention. However, items pertaining to seeking support from supervisors and peers, practice of the skills learned during training, and looking for opportunities to demonstrate the skills learned during training were also included. The eleven items that were developed are listed below. The response scale ranged from 1 (Strongly Disagree) to 7 (Strongly Agree).

1. I will discuss with my supervisor ways to develop the skills which I have learned;

2. I will discuss with my co-workers ways to develop the skills which I have learned;

3. I will spend time thinking about how to use the skills which I have learned;

4. I will evaluate how successfully I can use the skills which I have learned;

5. I will look for opportunities to use the skills which I have learned;

6. I will review course materials in order to develop the skills which I have learned;

7. I will practice using the skills which I have learned;

8. I will set specific goals for maintaining the skills which I have learned;

9. I will seek expert help/advice in order to maintain the skills which I have learned;

10. I will examine my work environment for potential barriers to using the skills which

I have learned; and

11. I will monitor my success at using the skills which I have learned.

Procedure

Participants all received the Pre-training Questionnaire prior to their attendance

at the training program and were requested to bring it with them to their training. The

covering letter explained the purpose of the study as well as the steps that were taken to

ensure confidentially of the data. The trainees were also asked to sign a statement of

informed consent. The Post-training Questionnaire was handed out at the completion of

training and participants were requested to return it to the researcher.

Results

Preliminary analyses

Because some of these scales had not been used before, we began by using

principal component (PC) analysis to checking their dimensionality. For the measure of

Pre-Training Self-Efficacy, two factors were extracted accounting for 61.8% and 10.6%

of the variance respectively. For the measure of Pre-Training Motivation, one factor

was extracted accounting for 61.4% of the variance. For the measure of Transfer

Implementations Intentions, three factors were extracted accounting for 50.7%, 12.6%,

and 9.7% of the variance respectively. Hambleton, Swaminathan and Rogers (1991)

suggested that where the initial factor extracted using PC analysis accounted for a large

proportion of the variance, and where the variance accounted for by the first factor is

more than three times the variance accounted for by the second factor, the scale can be

viewed as unidimensional. In all cases, this was the pattern of the results and average

scores on all scales were used in subsequent analyses.

Table 1 presents descriptive statistics and Cronbach Alpha reliability coefficients for all scales. The intercorrelations among the variables were also calculated and are presented in Table 2. These correlations were calculated based on those respondents who had completed both questionnaires. All analyses were conducted using SPSS for Windows (Release 11.5.0).

Insert Table 1 & 2 here

From these tables we can see that the participants demonstrated variability in their responses to most variables with scores clustering around the midpoints of their Likert scales. Scores for self-efficacy and motivation were towards the upper end of the scales. The correlations ranged from close to zero to as high as .75, with all variables showing some significant relationships. The remaining analyses test whether the patterns among these correlations were as expected.

Factor analysis of transfer climate variables, PA and NA

The first hypothesis related to the underlying structure of the CTQ, where two factors corresponding to antecedents and consequences were expected to emerge. Bartlett's test of sphericity indicated that the matrix formed by these variables was suitable for factor analysis (χ^2, 15 = 260.9, $p < .01$). Principal components analysis employing root one criterion indicated that a single factor explained most of the variance in this matrix with the first eigenvalue capturing 63.5% of the variance and the second factor a mere 13.8%. Forcing a two-factor solution using oblique rotation of the axes (direct oblimin) yielded a factor that was defined by the three "antecedent" marker variables plus positive reinforcement and a second factor defined by the two "consequences" variables, negative reinforcement and extinction.

These findings indicated that while there may be two underlying factors, they did not match the hypothesized factors of Antecedents and Consequences. When a two-factor solution was forced, the CTQ variables separated into what appeared to be positive versus negative valence groupings. To test this possible underlying structure further, a second factor analysis was conducted, this time including the PA and NA variables. If positive and negative valences were the underlying dimensions, adding the affectivity variables should help these dimensions to emerge more clearly. This is in fact what happened. Principal axis factor analysis employing root one criterion with oblique rotation yielded the two factors described above. PA served as an additional marker for the positive valence factor and NA acted as a marker for the negative valence factor. The pattern matrix is shown in Table 3.

Insert Table 3 here

Regression analyses involving pre-training self-efficacy and motivation

In order to assess hypothesis two, Pre-Training Self-Efficacy and Pre-Training Motivation were regressed on PA and NA (which were entered at the first step), and the six CTQ variables (which were entered at the second step). Pre-Training Self-Efficacy was also included as a predictor of Pre-Training Motivation (and was entered at the third step). The results of these analyses are presented in Table 4.

Insert Table 4 here

The results of the hierarchical regression analyses show that both PA and NA significantly contributed to the prediction of Pre-Training Self-Efficacy and Pre-Training Motivation (β = .42, *p* < .001 and β =.35, p < .01 for PA, and β = -.28, *p* < .01 and β = -.28, p < .01 for NA respectively). However, none of the CTQ variables were significant predictors of Pre-Training Self-Efficacy while Positive Reinforcement (β =

.35, p < .05) was the only significant predictor of Pre-Training Motivation. The increase

in variance explained by the CTQ variables when entered as a set was not significant for

either Pre-Training Self-Efficacy, ΔF (6, 66) = 1.41, p > .05, or Pre-Training

Motivation, ΔF (6, 66) = 1.13, p > .05. Finally, Pre-Training Self-Efficacy was a

significant predictor of Pre-Training Motivation (β = .66, p < .001).

These results do not support the second hypothesis with the significant

correlations between four of the CTQ variables (Goal Cues [r = .32, p < .01], Social

Cues [r = .28, p < .05], Task Cues [r = .30, p < .01], and Positive Reinforcement [r =

.36, p < .01]) and Pre-Training Self-Efficacy, and between five of the CTQ variables

(Goal Cues [r = .28, p < .05], Social Cues [r = .32, p < .01], Positive Reinforcement [r =

.42, p < .01], Negative Reinforcement [r = .25, p < .05], and Extinction [r = .24, p <

.05]) and Pre-Training Motivation being explained by the associations between these

variables and both PA and NA. Further analyses examining whether Pre-Training Self-

Efficacy was a mediator between the CTQ variables and Pre-Training Motivation were

not undertaken given that the CTQ variables predicted neither Pre-Training Self-

Efficacy nor Pre-Training Motivation when entered as a set.

Regression analyses involving transfer implementation intentions

The third hypothesis was assessed by regressing Transfer Implementation

Intentions on PA and NA (which were entered at the first step), and the six CTQ

variables (which were entered at the second step). The results of these analyses are

presented in Table 5.

Insert Table 5 here

The results of the hierarchical regression analyses show that only NA

significantly contributed to the prediction of Transfer Implementation Intentions (β = -

.28, $p < .05$). Once again, none of the CTQ variables were significant predictors of

Transfer Implementation Intentions. The increase in variance explained by the CTQ

variables when entered as a set was not significant ΔF (6, 66) = 1.31, $p > .05$.

These results failed to support the third hypothesis. Even though Transfer

Implementation Intentions were positively correlated with Goal Cues ($r = .39, p < .01$),

Social Cues ($r = .33, p < .01$), Positive Reinforcement ($r = .29, p < .05$), Negative

Reinforcement ($r = .31, p < .01$), and Extinction ($r = .25, p < .05$), these correlations

were explained by the associations between these variables and NA. Even omitting PA

and NA from the regression analyses failed to result in any of the CTQ variables

significantly predicting Transfer Implementation Intentions.

Discussion

The current study focused on understanding the dimensionality of the transfer

climate and the relationship of different aspects of transfer climate with critical training-

related variables including trainees' pre-training self-efficacy, pre-training motivation,

and post-training transfer implementation intentions. The role of PA and NA in

influencing perceptions of transfer climate and its relationship with other training-

related variables was also clarified. The results of the factor analysis indicated that

transfer climate is underpinned by two correlated constructs. The variables that loaded

on each of these constructs suggested that first factor was not solely reflecting possible

antecedents to transfer and might be better construed as being perceptions of a "Positive

Transfer Climate". The variables that loaded on the second factor might be better

construed as perceptions of a "Negative Transfer Climate". The stronger loading of NA

compared to PA suggests that NA will exert a greater influence on perceptions of the

negative aspects of the transfer climate.

Regression analyses indicated that only one of the transfer climate variables uniquely added to the prediction of Pre-Training Motivation, while not one of the transfer climate variables predicted Pre-Training Self-Efficacy. This result failed to support previous research demonstrating that transfer climate was directly related to both trainees' pre-training levels of self-efficacy and motivation (Tracey et al., 2001). In the present study, we chose to partial out the influence of PA and NA and only examine what unique variance the CTQ variables contributed to pre-training levels of self-efficacy and motivation. Another strategy would be to enter the PA and NA variables after entering the transfer climate variables, which would be more consistent with these variables being influenced by the transfer climate. In this case, PA and NA might operate as mediators between perceptions of the transfer climate and pre-training self-efficacy and motivation.

Further regression analyses indicated that only NA was a significant predictor of Transfer Implementation Intentions. Even when PA and NA were not included, none of the CTQ variables were significant predictors of Transfer Implementation Intentions. This result does not support suggestions that transfer climate plays a role in determining post-training transfer of learning, although it is acknowledge that a stronger case could be made if a measure of post-training performance was being predicted. Transfer implementation intentions are an important outcome of training and have been shown to be influenced by post-training self-efficacy, learning outcomes, and in-training transfer enhancing activities (Machin & Fogarty, 2003).

One of the major finding emerging from this study is that Pre-Training Motivation is strongly influenced by Pre-Training Self-Efficacy, even after controlling for the affectivity and transfer climate variables. What the findings suggest is that

variables that help to explain variance in Pre-Training Self-Efficacy may have an important indirect role to play in increasing motivation. The measures of NA and PA contributed significantly to the prediction of both Pre-Training Self-Efficacy and Pre-Training Motivation. Therefore, future models should incorporate both NA and PA as potential predictors of pre-training measures of self-efficacy and motivation. What is unclear is whether the trainees' levels of affectivity are contributing to their perceptions of the transfer climate or are a product of the transfer climate.

Kozlowski and Salas (1997) and Kozlowski, Brown, Weissbein, Cannon-Bowers and Salas (2000) also commented that the impact of the work environment on transfer of training needs to include a multi-level framework that recognises that transfer of training at the individual level is dependent on organisational factors that operate at a higher level of analysis. Transfer at the team level is dependent on organisational factors that operate at the departmental or organisational level. Therefore, if the transfer environment has only been examined at the individual level, as was done in this study, it is possible that important environmental influences that only occur at higher levels may have been ignored. For example, Haccoun and Saks (1998) argued that training which is not supported by organisational change efforts is likely to be ineffective. Training managers will have to consider all of the environmental constraints within which training operates and focus on providing the kinds of training that are aligned with their organisation's strategic directions.

Limitations of the study

This study relied on self-report measures for all of the data which introduces an unknown amount of common method variance. Podsakoff, MacKenzie, Lee and Podsakoff (2003) reported estimates of the degree to which method variance typically

contributed to the measurement of a construct and the relationships between measures of constructs. Approximately one quarter of the variance in any measure may be a result of systematic measurement error, while approximately 35% of the variance shared by measures of different constructs may be common method variance. Given these estimates, any of the significant results from this study should be interpreted with a great deal of caution.

Another factor that may contribute to less precision in the estimates of the factor loadings and regression weights is the small sample size. This is reflected in the shrinkage of the multiple correlation coefficient, which is greater when the sample size is small leading to an overestimation of the strength of association between the variables. Maxwell, Camp and Arvey (1981) suggested that the adjusted R^2 value is the preferred measure of the strength of association when it is used as an inferential statistic.

We also acknowledge that research into transfer of learning should include multiple measures of training performance and post-training behaviour in order to differentiate between the different learning outcomes possible (Kraiger, Ford & Salas, 1993; Kraiger & Jung, 1997). In particular, measures of adaptive expertise need to be developed, longer periods of time allowed before transfer outcomes are assessed, and multiple levels of analysis included (Ford & Weissbein, 1997).

Conclusions

The current study attempted to overcome some of the deficits of the previous research, especially in the measurement of different aspects of the transfer climate, and the inclusion of PA and NA in the analyses. The results indicate that the two measures of affectivity are related differently to the two main categories of climate for transfer,

that is, positive and negative transfer climate. The affectivity variables were also predictors of pre-training self-efficacy and motivation, while only NA was able to predict transfer implementation intentions. Our results confirmed that pre-training self-efficacy plays a key role in predicting trainees' pre-training motivation. However, after controlling for PA and NA, the CTQ variables did not contribute to the prediction of pre-training self-efficacy or transfer implementation intentions, and only one subscale was a predictor of pre-training motivation. This suggests that transfer climate plays a relatively small role in influencing the pre-training levels of readiness of the trainees to undertake training, or the post-training precursors to transfer of one's training. In comparison to other pre-training variables, transfer climate may not warrant the emphasis that it has received. Transfer climate may be a stronger determinant of post-training behaviour and transfer of learning.

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Acknowledgements

Table 1

Descriptive statistics and reliabilities for all scales

Variables	No. of items	Alpha	*N*	*M*	*SD*
1. Positive Affectivity	10	.89	76	5.52	.73
2. Negative Affectivity	10	.92	76	2.57	1.34
3. Goal Cues	6	.81	78	4.74	.85
4. Social Cues	10	.84	78	4.69	.82
5. Task Cues	9	.84	78	4.51	.94
6. Positive Reinforcement	10	.79	78	4.70	.70
7. Negative Reinforcement	8	.66	78	4.83	.77
8. Extinction	10	.83	78	4.62	.95
9. Pre-Training Self-Efficacy	11	.94	77	6.51	.47
10. Pre-Training Motivation	9	.92	77	6.72	.40
11. Transfer Implementation Intentions	11	.90	101	5.97	.82

Table 2

Intercorrelations for all variables

Variable	1	2	3	4	5	6	7	8	9	10
1. Positive Affectivity	1.00									
2. Negative Affectivity	-.15	1.00								
3. Goal Cues	.33**	-.15	1.00							
4. Social Cues	.33**	-.26*	.75**	1.00						
5. Task Cues	.15	-.05	.50**	.46**	1.00					
6. Positive Reinforcement	.37**	-.13	.71**	.66**	.43**	1.00				
7. Negative Reinforcement	.07	-.47**	.47**	.55**	.33**	.39**	1.00			
8. Extinction	.08	-.42**	.40**	.58**	.29*	.43**	.64**	1.00		
9. Pre-Training Self-Efficacy	.46**	-.33**	.32**	.28*	.30**	.36**	.16	.18	1.00	
10. Pre-Training Motivation	.40**	-.33**	.28*	.32**	.18	.42**	.25*	.24*	.72**	1.00
11. Transfer Implementation Intentions	.19	-.29*	.39**	.33**	.17	.29*	.31**	.25*	.24*	.39**

Note. $N = 74$ (based on listwise deletion). * $p < .05$ (two-tailed), ** $p < .01$ (two-tailed).

Table 3

Significant factor loadings for each of the variables, and percents of variance explained

for Principal Axis FA of the CTQ variables, PA and NA after oblique rotation

Variables	F_1	F_2
1. Positive Affectivity	**.38**	.05
2. Negative Affectivity	.10	**.63**
3. Goal Cues	**.89**	-.01
4. Social Cues	**.73**	-.26
5. Task Cues	**.56**	-.04
6. Positive Reinforcement	**.84**	-.02
7. Negative Reinforcement	.14	**-.76**
8. Extinction	.20	**-.69**
Percent of variance explained	31.9%	19.0%

Note: Factor loadings above .35 in magnitude were used in interpreting the meaning of

the factors and are highlighted in bold face type.

Table 4

Regression of Pre-Training Self-Efficacy (and then Motivation) on PA, NA, the six CTQ variables (and then Pre-Training Self-Efficacy).

Predictors	Pre-Train Self-Efficacy			Pre-Train Motivation		
	β	t	sr	β	t	sr
1. PA	.42	4.22***	.42	.35	3.40**	.35
2. NA	-.28	-2.76**	-.27	-.28	-2.70**	-.28
After Step 1:	$R^2 = .29$ (Adj. $R^2 = .27$)			$R^2 = .24$ (Adj. $R^2 = .22$)		
	$F (2, 72) = 14.86, p < .001$			$F (2, 72) = 11.11, p < .001$		
3. Goal Cues	.09	.52	.05	-.10	-.55	-.06
4. Social Cues	-.14	-.76	-.07	-.01	-.06	-.01
5. Task Cues	.22	1.86	.18	.02	.14	.01
6. Pos. Reinf.	.17	1.04	.10	.35	2.08*	.21
7. Neg. Reinf.	-.11	-.79	-.08	.04	.26	.03
8. Extinct.	-.01	-.09	-.01	-.03	-.17	-.02
After Step 2:	$R^2 = .37$ (Adj. $R^2 = .30$)			$R^2 = .31$ (Adj. $R^2 = .22$)		
	$\Delta F (6, 66) = 1.41, p > .05$			$\Delta F (6, 66) = 1.13, p > .05$		
9. Pre-Train Self-Efficacy				.66	6.51***	.52
After Step 3:				$R^2 = .58$ (Adj. $R^2 = .52$)		
				$\Delta F (1, 65) = 42.37, p > .001$		

Note. N = 75 (based on listwise deletion). *sr* is the semipartial correlation. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 5

Regression of Transfer Implementation Intentions on PA, NA, and the six CTQ

variables.

	Dependent Variable		
Predictors	Transfer Implementation Intentions		
	β	t	sr
1. PA	.17	1.48	.16
2. NA	-.28	-2.48*	-.27
After Step 1:	$R^2 = .12$ (Adj. $R^2 = .10$)		
	$F (2, 72) = 4.95, p < .05$		
3. Goal Cues	.29	1.53	.17
4. Social Cues	.01	.03	.00
5. Task Cues	-.03	-.21	-.02
6. Pos. Reinf.	.01	.07	.01
7. Neg. Reinf.	.07	.42	.05
8. Extinct.	.00	.00	.00
After Step 2:	$R^2 = .21$ (Adj. $R^2 = .12$)		
	$\Delta F (6, 66) = 1.31, p > .05$		

Note. N = 75 (based on listwise deletion). *sr* is the semipartial correlation. *p < .05. **p

< .01. ***p < .001.

Figure Caption

Figure 1. Transfer Training Model from Thayer and Teachout (1995).

Reaction to previous training

Previous K & S (Education)

Self-efficacy (Pre-training)

Ability

Locus of Control

Job Involvement

Career/Job Attitudes

Reaction to Training

Self-efficacy (Post-training)

Climate for Transfer
- Cues (Antecedents): Goal Cues, Social Cues, Task Cues
- Consequences: Positive Reinforcement, Negative Reinforcement and Punishment, Extinction

Learning

Transfer

Results

In-training Transfer Enhancing Activities (includes Goal Setting, Relapse Prevention)