

# Organizational learning culture, learning transfer climate and perceived innovation in Jordanian organizations

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*This paper examines the relationship between organizational learning culture, learning transfer climate, and organizational innovation. The objective was to test the ability of learning organization culture to account for variance in learning transfer climate and subsequent organizational innovation, and to examine the role of learning transfer climate as a mediator between learning organization culture and innovation. Results showed that organizational learning culture predicted learning transfer climate, and both these factors accounted for significant variance in organizational innovation.*

## Introduction

Technological advancements, dynamic customer demands, increasing globalization, the blurring of organizational boundaries, and increasing competition are all combining to produce organizational environments 'more turbulent and volatile than ever before' (Parry & Proctor-Thompson, 2003, p. 377). Given the uncertain nature of organizational environments, it is not surprising that increasing attention in the human resource development (HRD) and organizational development (OD) literature has been paid to learning organizations. A recurring theme in this literature is that the adoption of some or all of the features of the learning organization enables organiza-

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tions to develop more flexible and adaptable systems that improve long-term performance (Guns, 1996; Senge, 1992; Slater & Narver, 1995).

However, the literature addressing the learning organization is largely descriptive and conceptual in nature. Although many authors have described why a learning organization should work, there are few specific descriptions about the mechanics of how the learning organization as a strategy works to improve performance (Kaiser, 2000). In an effort to bridge this gap in the learning organization literature, Kaiser and Holton (1998) have identified a number of parallels between the characteristics and recommended procedures in the learning organization literature and the innovation literature. They note that the learning organization and innovation literatures both focus on the facilitating role of the same organizational variables and strategies that will enhance the adaptability and flexibility of organizations in ways that improve long-term performance. In effect, organizational learning and innovation appear to reflect closely related processes and to be influenced by many of the same variables including culture, climate, leadership, management practices, information acquisition, retrieval, and sharing, and organizational structures, systems and environment (Kaiser, 2000). The convergence on common outcomes together with the similarity in influencing variables has been interpreted as suggesting that innovation may be a close relative of organizational learning (Kiernan, 1993) and a relationship may exist between the two.

Given the interest in innovation and learning organizations – and what we know about them as separate constructs – the link between them becomes a subject of research interest. For example, it has been suggested that every organization is to some degree a learning organization but are differentiated by the degree to which they learn better, faster, or more completely (Mai, 1996). This could be revealed through outcomes like creativity and innovation and is likely to be facilitated and supported by psychological climates and human resource systems that enhance and support learning and its application. The purpose of this paper is report on an initial exploratory examination of the relationship between organizational learning culture, learning transfer climate and organizational innovation. The objective was to empirically examine the ability of learning organization culture to account for variance in learning transfer climate and subsequent organizational innovation. Our analysis also seeks to examine the role of learning transfer climate as a mediator between learning organization culture and innovation. The research model shown in Figure 1 depicts a partially mediated model that views learning organization culture as an antecedent that influences learning transfer climate which, in turn, affects organizational innovation.

## The research model

### Organizational learning culture and innovation

The outcome of interest in this study is organizational innovation. For our purposes, innovation will be equated with the adoption and application of new knowledge and practice. This conceptualization is consistent with that of other researchers (Agrell &

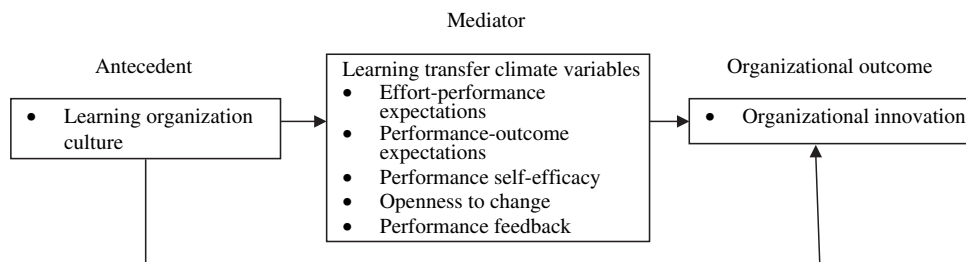


Figure 1: Research model

Gustafson, 1994; Burningham & West, 1995; West & Anderson, 1996) and emphasizes that learning and its application are principal processes in innovation. For example, both Kanter (1983) and Van de Ven (1986) see innovation as a process of generating, developing, and implementing new knowledge for the purpose of problem-solving.

Organizational culture refers to the 'shared meanings and manifestations' of organizational behavior (Kopelman *et al.*, 1990, p. 284) and, as such, emphasizes the common beliefs, values and assumptions of organizational members. Organizational culture is learned by individuals and groups as they encounter, work through, and resolve problems and challenges. It is a consequence of commonly accepted assumptions and produces 'automatic patterns of perceiving, thinking, feeling, and behaving' that 'provide meaning, stability, and comfort' (Schein, 1990, p. 111). The learning organization literature emphasizes the role of organizational culture to the extent it indicates that a consensus has developed among organization members about the value of learning and use of new learning for creative purposes in the pursuit of organizational goals and objectives. In discussing organizational learning, for example, Watkins and Marsick (1993), Marquardt (1996) and others see a culture that supports the acquisition of information, the distribution and sharing of learning, and provides rewards and recognition for learning and its application as critical for successful learning organizations.

The literature on organizational innovation focuses heavily on the role of culture as a facilitator largely because of the role that organizational culture plays in learning and change (Bluedorn & Lundgren, 1993). Kotter and Heskett (1992) identified an adaptive, learning culture – or a culture that fosters and nurtures innovation – as the optimal culture for organizations pursuing long-term innovation and performance in dynamic environments. An organizational learning culture becomes important in the consideration of innovation because it enables an organization to anticipate and adapt to the dynamics of a changing environment. In fact, an organizational learning culture has been characterized as one in which all organizational members value learning and strive for high performance through the application of learning to progressive, innovative work (Tracey *et al.*, 1995; Rosow & Zager, 1988). Organizational learning culture emphasizes the open exchange of information and ideas in ways that facilitate learning and its creative application. In effect, learning organization culture can be seen as a critical facilitator of creativity and innovation because it supports inquiry, risk-taking, and experimentation. This leads to our first hypothesis, the major point of which is to recognize the role that organizational learning culture plays in organizational innovation:

**H1:** Employee perceptions of learning organization culture will explain a significant amount of variance in perceptions of organizational innovation.

### **Culture, climate, and the organizational learning culture-transfer climate connection**

As a general construct, climate can be defined as a psychologically meaningful description of the work environment (James & Jones, 1976; Jones & James, 1979) or, similarly, an individual psychological state affected by organizational conditions like culture, structure, and managerial behavior (Burke & Litwin, 1992). Thus, climate – or more appropriately psychological climate – is

a set of attributes specific to a particular organization that may be induced from the way the organization deals with its members and its environment. For the individual member within an organization, climate takes the form of a set of attitudes and expectancies which describe the organization in terms of static characteristics... and behavior-outcome and outcome-outcome contingencies (Campbell *et al.*, 1970, p. 390).

Climate is therefore not the work environment *per se* but the way in which people respond to it; it is the 'perceptual medium' (Kopelman *et al.*, 1990) through which culture and other the work environment factors influence job-related attitudes and

behaviors. Put somewhat differently, it is the 'sense of imperative' that arises from a person's perceptions of his or her work environment, one that influences how he or she responds (Schneider & Rentsch, 1988). In the context of innovation, for example, this sense of imperative could be reflected in perceptions of task-related support for creative learning and problem-solving or in the cognitive (e.g., attitudes about change and innovation) and affective states (e.g., motivation to innovate) that ensue from these perceptions.

Organizational culture differs from climate in that culture is based on beliefs that are shared organization-wide, while climate is based on what an individual senses in and about the organizational environment (Reichers & Schneider, 1990). In effect, climate emerges from aspects of the organizational context that individual employees perceive to be important and influential in their work. Because of this, climate is seen as a more salient feature of an organization to the degree that different beliefs, meanings, and symbols (i.e., culture) give rise to individual expectations, perceptions, and interpretations of the organizational environment that have a main effect on behavior (Denison, 1996; Schein, 1990). This view is consistent with considerable research into organizational climate that recognizes it as a useful multidimensional construct that can be applied to a wide variety of organizational and perceptual variables reflective of organizational-individual interactions (Glick, 1985; Schneider, 1980).

If an organizational learning culture is to lead to innovation and long-term performance improvement, then the production and sharing of knowledge must be accompanied by efforts at applying or transferring that knowledge in ways that help the organization function more effectively. This fundamental requirement highlights a crucial element linking both learning organization cultures and innovation in organizations: that is, the need for a positive, supportive psychological climate for learning application (i.e., transfer).

Culture and climate are clearly related concepts, and some believe that they are most useful in understanding organizational phenomena when used in conjunction with one another (Schneider & Rentsch, 1988). As we have noted, organizational learning cultures are those that support the acquisition of information, the distribution and sharing of learning, and that reinforce and support continuous learning and its application to organizational improvement. Such a culture is reflected by an organization-wide pattern of values and beliefs about the importance of learning, its implementation and dissemination. These values and beliefs are based on observable, salient work context factors such as norms associated with creativity and innovation, human resource practices that support ongoing employee development, and managerial practices that facilitate efforts directed at change and innovation. These values and beliefs function to shape individual psychological climates associated with the acquisition and application of new knowledge and skills and are reflected in factors such as individual expectations and self-beliefs about learning application and beliefs about the value of change and improvement through learning. These last factors represent a subset of elements that comprise what has been termed a learning transfer climate in organizations (Holton *et al.*, 1997). Thus, our second hypothesis is formulated to recognize that positive learning transfer climates – specifically, expectations and self-beliefs about one's ability to use learning transfer for performance improvement – are related to learning organization culture.

**H2:** Perceptions of learning organizational culture will explain a significant amount of variance in a block of learning transfer climate variables that includes transfer effort-performance expectations, performance-outcome expectations, performance self-efficacy beliefs, and openness to change perceptions.

### Learning transfer climate as mediator

We believe that learning transfer climate represents a potentially important mediator between organizational learning culture and organizational outcomes. This conceptualization is consistent with James and Jones (1976) model of organizational functioning

in which they argue that climate is causally tied to outcome criteria such as productivity, turnover, and so on through two mechanisms: attitudes and motivation, and job behaviors and performance. Our outcome criterion of interest is innovation which we, like James and Jones, see as an organizational outcome variable that is a direct product of individuals' attitudes, motivation, and behavior. In other words, we suspect that one element of successful organizational learning strategies is the creation of favorable learning transfer climates. This is because learning organization cultures (a) emphasize the value of learning and its creative application to solving job-related problems, and (b) typically include a strong linkage between desired organizational goals and outcomes and learning (Holton, 2005). Both of these factors provide for the development of policies, practices, and procedures consistent with climates that support the application of learning. Such climates get translated into salient organizational outcomes like innovation through their impact on individual employees' cognitive and affective states including such things as expectancies about performance improvement efforts and outcomes, efficacy beliefs about the potential for change and improvement, and values and norms about change and adaptation (i.e., innovation). The supposition of a climate-innovation is consistent with research indicating that such a link does exist (Abbey & Dickson, 1983). In short, learning organization cultures support the development of functional learning transfer climates that facilitate and enhance organizational outcomes such as innovation and productivity through their effect on individuals' motivation, attitudes and behavior. Our third hypothesis is designed to examine the role of climate as a mediator between learning organization culture and organizational innovation:

**H3:** Regression results will support the inference of a partially mediated model in which the block of transfer climate variables partially mediate the relationship between perceptions of learning organization culture and organizational innovation.

## Methodology

### Population and sample

Data for this study were collected from 450 subjects employed by 28 different organizations in Jordan. Both purposive sampling and convenience sampling were used. Approximately 38% (n = 172) of the respondents were from public sector organizations and about 62% (n = 278) were from the private sector. A little over 25% of the respondents were from public sector educational institutions with the remainder fairly evenly divided between public/governmental organizations and private sector manufacturing, high-tech, banking, insurance, retail, and service organizations. A slight majority of the sample was male (54%). Respondents were predominantly 30 or more years old (71.4%) and held a bachelor's degree or higher (89.1%). Over 60% of the respondents had four or more years of work experience in their respective organizations.

### Instrumentation

#### Innovation

A five-item scale was used to measure perceived organizational innovation. Scale items were drawn from an assessment tool entitled Assessing Strategic Leverage for the Learning Organization (ASLLO) (Gephart *et al.*, 1997). This scale was designed to measure the perceived ability of an organization to adopt or create new ideas and implement these ideas in the development of new and better products, services, and work processes and procedures (Kaiser & Holton, 1998).

#### Organizational learning culture

Items for the three scales used to measure organizational learning culture were also drawn from the ASLLO. The knowledge indeterminacy scale was a four-item scale

designed to measure the perceived belief that knowledge in organizations is not fixed and that anyone can be a source of learning and knowledge. The learning latitude scale was a four-item scale designed to measure the belief that individuals are free to be independent thinkers and are able to freely promote and try new ideas. The organizational unity scale was a five-item scale measuring the belief that all organizational members share a common goal and are all working for the benefit of the organization and its stakeholders. These three scales were summed to yield a single score for organizational learning culture.

### Learning transfer climate

The learning transfer climate measures were drawn from the Learning Transfer Systems Inventory (LTSI) developed by Holton and Bates (2002). The LTSI is a diagnostic tool used to assess a set of 16 factors that influence learning transfer and to assess transfer systems in organizations. It is an 89-item instrument with two sections: the first section contains training-specific constructs that reference a specific training program. This section includes 63 items representing 11 constructs. The second section of the LTSI contains 26 items, measuring five constructs that reference training in general in the respondent's organization.

Because we were concerned with the learning transfer climate in general (as opposed to that generated from a specific training program) the training-in-general measures were used in this study as an indicator of psychological climate attached to learning transfer. The training-in-general measures consist of five scales that reflect perceived task support elements and individual cognitive states that, taken together, comprise a psychologically meaningful 'sense of imperative' regarding learning and its application. The two scales reflecting task support elements included performance coaching (six items) and openness to change (four items). Performance coaching measures the extent to which individuals perceive they receive constructive input, assistance, and feedback from people in their work environment when applying new knowledge or trying new ideas to improve work performance. Openness to change measures an individual's perceptions about his or her work group's disposition toward change, willingness to invest energy in change, and the degree of support provided when trying to use new learning to change and improve work performance. The three measures reflecting individual cognitive states included performance self-efficacy (PSE), transfer effort-performance expectations (TEPE), and performance-outcome expectations (POE). Performance self-efficacy (four items) assessed the extent to which individuals feel confident and self-assured about applying new learning, ideas, and abilities in their jobs, and can overcome obstacles that hinder the use of new learning. Transfer effort-performance expectations (four items) assessed the extent to which individuals believe that applying new learning will improve performance. Performance-outcomes expectations (three items) measured the extent that individuals believe the application of new learning will lead to recognition or rewards they value. All scales in the study used Likert-type response options ranging from 1 = strongly disagree to 5 = strongly agree.

### Instrument translation

The scales used in this study had been developed originally in English and were translated into Arabic for use in Jordanian organizations. Because the quality of translation is the key to ensuring the functional equivalence between the English and Arabic versions of the measures, a forward-backward translation process with subjective, objective, and pilot evaluations was used. This process drew on the cross-cultural instrument development work of Sperber *et al.* (1994) and Brislin (1970). The goal of the translation and process was to produce an Arabic version of the items that were equivalent *in meaning* to the original English versions. Thus our objective was an *equivalent translation* not an identical word-by-word translation of items. Equivalent translations emphasize functional equivalence or the equivalence of meaning of the



survey items between the original and translated instruments. Functional equivalence helps to ensure that the translated measures work in the new target culture as well as they did in the original culture by ensuring that the items do not lose their core meaning in the translation process and that the language used in the translated items has appropriate form and readability. The translation process is summarized below.

### **Forward and backward translation**

Two translators bilingual in English and Arabic separately translated the English version of the items into Arabic (forward translation). These translators were instructed to retain the meaning of the items as close to the original as possible. The resulting items were then compared to assess the item-by-item similarity across the two translations. In the case of discrepancies or disagreements, the translators discussed and revised the items until consensus was reached. When the Arabic translation was finalized, the items were then back-translated (from Arabic to English) by two other people bilingual in English and Arabic following the same comparison and revision process.

### **Subjective evaluation**

The researchers evaluated the back-translated items to ensure that item meanings were equivalent in both the original English versions and the back-translated version. If differences in meaning were found between items, those items were put through the forward and back-translation process again until the researchers were satisfied there was substantial meaning equivalence.

### **Objective evaluation**

Following the subjective evaluation, a rating process was implemented in which a group of 19 native English speakers (HRD graduate students and other HRD professionals) compared the back-translated items with the original items and rated the functional equivalence of each pair using a seven-point Likert-type rating scale with anchors ranging from 1 (Not at all similar in meaning) to 7 (Very similar in meaning). Items with mean ratings below four would have been put through the forward, back-translation and subjective evaluation process again. However, no mean ratings fell below this threshold.

### **Pilot test**

The Arabic version of the survey was pilot tested with a group of 12 employees in Jordan to collect feedback about instrument content and usage. This feedback did not lead to any substantive changes.

### **Data collection**

The survey instrument was administered in Jordan to employees at varying time lengths following an episode of organizational training. Time varied from directly after training to six months after training. When distributed at the end of the training program, either the researchers or the administrator of the training distributed and collected the instruments. In the other cases the instruments were distributed to trainees through the human resources personnel and then returned to the researchers.

### **Data analysis**

Exploratory (common) factor analysis was used to identify the latent construct structure of the survey items and to provide some evidence of construct validity and cross-cultural equivalence. Common factor analysis is seen by some as more appropriate

than principal component analysis when the objective is identification of latent structures (Nunnally & Bernstein, 1994). Oblique rotation was employed because of its suitability for latent variable investigation when latent variables may or may not be orthogonal (Hair *et al.*, 1998). Multiple criteria were used to determine the number of factors to retain including examination of the scree plot and eigenvalues greater than or equal to one. In the analysis, (a) factor loadings reflected interpretable simple structures; (b) only items with loading 0.40 or higher were included in the scales; and (c) average item loading values were greater than 0.50 on major factors and less than 0.05 on other factors for all scales.

Bivariate correlations were calculated to examine the direction and magnitude of inter-variable associations. Hierarchical regression analysis was used to determine whether the mediated model provided a reasonable description of the relations among variables. A mediated model is one in which a variable or variables (the mediator) 'accounts for the relation between the predictor and the criterion' (Baron & Kenny, 1986, p. 1176). James and Brett (1984) describe two types of mediators, complete and partial. Complete mediation occurs when the mediating variable 'transmits all of the influence of the antecedent  $x$  to a consequence  $y$ , which implies that  $x$  and  $y$  are indirectly related' (p. 310) and that the relationship between  $x$  and  $y$  disappears when the mediator  $z$  is controlled for. Thus the independent variable significantly affects the mediator; the mediator significantly affects the dependent variable; and controlling for the mediator produces a non-significant relationship between the independent and dependent variables. Partial mediation occurs when the independent variable has a direct effect on the dependent variable as well as an indirect effect through the mediator (James & Brett, 1984). Partial mediation is suggested when controlling for the mediator does not attenuate the significant relationship between the independent and dependent variables.

Our research model suggested a partially mediated  $x \rightarrow z \rightarrow y$  linkage in which organizational learning culture ( $x$ ) directly influences innovation ( $y$ ) and the block of transfer climate variables ( $z$ ) mediates the relationship between organizational learning culture and innovation. To infer support for partial or completely mediated models using hierarchical regression, several statistical conditions must be met (Baron & Kenny, 1986). Specifically, three regression analyses need to be run in order to make inferences about the extent to which learning transfer climate functions as a mediator. A fourth regression analysis provides information about the nature of the mediated relationship (complete or partial mediation). In the first analysis, the predictor block (organizational learning culture) is regressed on the measure of innovation ( $x \rightarrow y$ ). Second, the mediator variable (the learning transfer climate block) is regressed on innovation ( $z \rightarrow y$ ). Third, the predictor block is regressed on the mediator ( $x \rightarrow z$ ). To infer support for a mediated relationship, each of these regression equations must be significant. Finally, to obtain information about the nature of the mediation (partial or complete) a hierarchical regression analysis is performed in which learning transfer climate (the mediator) is regressed on the outcome measure ( $z \rightarrow y$ ) and organizational learning culture ( $x$ ) is added as a second step. If adding  $x$  contributes significantly to the variance explained by the regression equation and  $z \rightarrow y$  remains significant, this suggests the presence of partially mediated relationship (i.e., one in which there are both direct and mediated effects). If adding  $x$  does not yield a significant  $R^2$  increment, then there is evidence of complete mediation. Finally, to control for the variation in innovation across organizational types (high-tech, manufacturing, service) and sectors (public, private) these variables were dummy coded and entered as control variables in each regression model.

## Results

### Descriptive statistics

Analysis of regression diagnostics following a process described by Bates *et al.* (1999) did not reveal any serious violations of regression assumptions, multicollinearity, or



Table 1: Scale means, standard deviations, correlations and coefficient alphas

Variable	N	%	M	SD	1	2	3	4	5	6	7
1 Organizational innovation	443	0.79	4.75	0.77	-						
2 Organizational learning culture	439	0.84	14.06	1.99	0.52*	-					
3 Openness to change	448	0.54	2.23	0.40	-0.01	-0.04	-				
4 Performance outcome expectations	447	0.86	3.54	0.84	0.17*	0.23*	-0.10*	-			
5 Transfer effort - performance expectation	443	0.79	3.90	0.63	0.21*	0.21*	-0.15*	0.41*	-		
6 Performance self-efficacy	449	0.80	3.90	0.64	0.09	0.19*	-0.26*	0.30*	0.54*	-	
7 Performance feedback	449	0.80	3.47	0.66	0.23*	0.22*	-0.20*	0.41*	0.33*	0.33*	-

The control variables Sector (public vs. private) and Industry type (e.g., high-tech, manufacturing, and service industry sectors) were dummy coded and therefore are not included in this table.

\*  $p < 0.05$ .

the presence of influential observations. The means, standard deviations, intercorrelations, and reliability estimates for all measures are shown in Table 1. Examination of the intercorrelations suggested several noteworthy patterns. First, the one-tailed correlations among variables were generally low to moderate suggesting the measures used in this study were assessing different constructs. Second, organizational learning culture showed significant correlations with all variables except openness to change. Innovation was correlated with all variables except openness to change and performance self-efficacy. Third, all of the associations were in the expected direction except for openness to change. Openness to change was negatively correlated with performance outcome expectations, effort performance-outcome expectations, performance self-efficacy, and performance feedback. This was somewhat surprising to the extent it is reasonable to expect that learning transfer climates that reflect positive reward orientations (i.e., strong values for performance-related expectations and efficacy beliefs) and relatively strong task support for transfer (performance coaching) would also tend to reflect a positive norm toward change. This finding suggests that Jordanian employees in organizations with learning-oriented cultures and supportive transfer climates perceived relatively little openness to change (despite rating the level of innovation relatively high).

### Mediated model evaluation

The steps and results of the regression tests for mediation are shown in Table 2. Results from the test of Model 1 show that, after entering the control variables, organizational learning culture was a significant predictor of organizational innovation ( $R^2 = 0.28$ ,  $p < 0.05$ ). This confirms H1. Results from the test of Model 2 in which innovation is the dependent variable showed that, after accounting for the variance explained by the control variables ( $R^2 = 0.04$ ,  $p < 0.05$ ), the learning transfer climate indicators explained a significant amount of variance in perceived organizational innovation ( $R^2 = 0.09$ ,  $p < 0.05$ ). The Model 3 test (H2) involved multiple dependent variables (the learning transfer climate variables) and therefore required the use of multivariate

Table 2: Regression analyses testing for mediation

Regression models	Variables	$R^2$	$F_{\text{model}}$	df	$R^2_{\text{change}}$
Model 1	Control variables <sup>†</sup>	0.04	9.49*	2,429	–
	$x^{\dagger} \rightarrow y^{\ddagger}$	0.28	53.34*	3,428	0.24*
Model 2	Control variables <sup>†</sup>	0.04	8.32*	2,429	–
	$z^{\dagger\dagger} \rightarrow y$	0.13	8.92*	7,424	0.09*
Model 3 <sup>++</sup>	Control variables <sup>†</sup>	0.03	2.59	5,420	–
	$x \rightarrow z$	0.10	9.06*	5,420	0.07*
Model 4	Control variables <sup>†</sup>	0.04	8.54*	2,419	–
	$z \rightarrow y$	0.13	9.09*	7,414	0.09*
	$z \rightarrow y + x$	0.31	23.24*	8,413	0.18*

<sup>†</sup> Sector & Organizational Task were entered as controls in each of these regression models.

<sup>†</sup>  $x$  = Organizational learning culture as the predictor.

<sup>++</sup>  $y$  = Innovation as the dependent variable.

<sup>+++</sup>  $z$  = Learning transfer climate indicators as the mediator variables.

<sup>++</sup> Because of the multiple dependent variables (the learning transfer climate variables) in Model 3, a Manova procedure was used in which the predictor variable (organizational learning culture) was specified as a covariate.

\*  $p < 0.05$ .

analyses of variance (Manova). In this analysis, after controlling for organizational task and sector, the main effect for organizational learning culture was significant ( $F = 9.06$ ,  $p < 0.05$ ). These results support H2. In addition, the results from the analysis of these three models support the inference that learning transfer climate as measured in this study mediated the relationship between the organizational learning culture and perceived organizational innovation.

To test H3 required that we obtain additional information about the nature of the mediation. For this reason a fourth regression analysis was performed. This required the use of hierarchical regression in which the learning transfer climate variables were regressed on innovation with organizational learning culture entered as a second step. Results showed that, after entering the control variables, the block of learning transfer climate variables were a significant predictor of innovation ( $R^2 = 0.09$ ,  $p < 0.05$ ), and the addition of organizational learning culture significantly increased the variance explained ( $R^2_{\text{change}} = 0.18$ ,  $p < 0.05$ ) yielding a total  $R^2$  of 0.27 excluding the variance explained by the control variables. These findings support the inference of a partially mediated model in which organizational learning culture had a direct effect on organizational innovation and learning transfer climate, and learning transfer climate, in turn, influences organizational innovation.

## Discussion

This study took the perspective that a culture of organizational learning is all about developing and applying intellectual capital in ways that make organizations more productive, and that learning and its transfer (application) are principal processes in organizational innovation. We speculated that learning and the factors that support the transfer of learning are part of an organizational learning culture that values the creation, sharing, and application of knowledge. This main purpose of this study was to examine the relationship between organizational learning culture, learning transfer climate, and organizational innovation. Specifically, we examined the ability of learning organization culture to account for variance in learning transfer climate and subsequent organizational innovation. Our analysis also sought to examine the role of learning transfer climate as a mediator between learning organization culture and innovation. The results supported all three of the hypothesized relationships. Findings indicated that organizational learning culture can predict learning transfer climates, and that both of these factors can account for significant variance in the perceived innovative capacity of an organization.

The results of this study are important for several reasons. First, the study extends what is known about organizational learning culture and its link to organizational outcomes. Although proponents of learning organizations have suggested that learning-oriented cultures can substantially influence organizational effectiveness, very little research has addressed this issue. As Kaiser (2000) has noted, the organizational learning literature is 'startling unclear' about how learning organization cultures improve critical organizational outcomes. The results of this study are particularly interesting because they suggest, first, that the values and beliefs associated with learning organization culture can indeed influence organizational innovation. Second, the results suggest that learning organizational culture can influence specific manifestations of psychological climate in the form of individual efficacy beliefs, attitudes about change, and effort-outcome and performance-outcome expectancies. Evidence emerged indicating that supportive learning transfer climates are consistent with organizational cultures that believe in and value learning as an adaptive strategy. Finally, this study demonstrated the value of using both culture and climate in conjunction in trying to understand organizational innovation. Examination of both of these organizational elements (learning culture and transfer climate) provided insight into what may be needed to foster the kind of inquiry, dialogue, risk taking and experimentation that is essential for organizational innovation and adaptation. For example, we know that a learning organization culture embodies a shared pattern of values and beliefs about the importance of learning, its dissemination and

application, and that these values and beliefs function to shape individual perceptions and behaviors associated with the acquisition and application of new knowledge and skills. Our results suggest these can be reflected in psychological climate factors such as individual expectations and self-beliefs about learning application and beliefs about the value of change and improvement through learning. On the basis of our findings, we conclude that innovation requires not only an organizational culture that allows learning and the generation of creative ideas to take place, but also a psychological climate that fosters an individual's ability to share and apply that learning.

### Implications for practice

There is considerable consensus today that a key competitive advantage for organizations lies in their ability to learn, be responsive, and to innovate. Because today's organizations are increasingly challenged by global forces that are powerful, dynamic, and often ambiguous, the ability to learn, change, and innovate are of considerable practical and theoretical significance. One method for coping with this challenge is to understand the factors that influence innovation and to develop strategies for managing it effectively. The results of this study indicated that the work environment in the form of organizational culture and a psychological climate conducive to the application of learning are both important for organizational innovation. It is therefore essential that organizations seeking to maximize creativity and innovation analyze their culture and climate to determine what changes may be needed to facilitate learning and its application to creative problem solving. Diagnostic work using validated survey instruments such as the Learning Transfer Systems Inventory (Holton & Bates, 2002) or using data collected through focus groups or interviews could provide insight into the cues, contingencies, and other organizational attributes influencing employee attitudes, beliefs, and behaviors relevant to learning and its creative application. This information could then be used to design interventions to reduce barriers and enhance catalysts for creativity and innovation.

### Limitations

There are several limitations in this study that deserve mention. First, this study relied on self-report and survey data. Although the correlation matrix indicated a relatively wide range of correlations, most generally consistent with expectations, common method variance could have inflated the correlations or affected the observed relationships in other unknown ways. On the other hand, some researchers have suggested that method bias may not be as serious a problem as has been assumed (Spector, 1987) and that the seriousness of the bias depends on the research question. For instance, when perceptions are the object of empirical interest, method bias may not be a serious issue (Clark *et al.*, 1993). Although we do not suspect that method bias significantly affected the pattern of results in this study, the use of additional data collection strategies or outcome measures would have strengthened the validity of our findings.

Second, the cross-sectional nature of the data as well as the analytical technique employed means that the causal relationships between variables in this study can only be inferred. Cultivating more valid insights about the causal antecedents and effects of learning transfer climate, organizational learning culture, and innovation would benefit from future research employing more rigorous research designs (e.g., longitudinal designs) and analytic techniques more suited to testing causal hypotheses (e.g., structural equation modeling). For example, because learning and its application to performance improvement or innovation is not a one-shot kind of experience (it typically requires some trial-and-error and adaptation), it is possible that the learning transfer climate variables would show a stronger relationship with innovation when assessed from a longer-term perspective.

## Conclusion

These findings suggest that organizational learning cultures may, through human resource and other practices, create learning transfer climates that can enhance and facilitate innovation and adaptation in organizations. It is one of the first studies to show a linkage between organizational learning cultures and innovation, and to underscore the role that a psychological climate for transfer can play in this linkage.

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