THE IMPACT OF SELF-MANAGEMENT LEADERSHIP ON ORGANISATIONAL CREATIVITY

John D. Politis

Higher Colleges of Technology, United Arab Emirates
john.politis@hct.ac.ae

Session H-1

Abstract

The objective of this paper was to empirically investigate through an industry survey, the impact of self-management leadership on the work environment dimensions that support creativity. The results of the study show a moderate and significant positive relationship between self-management leadership and the 'stimulant' dimensions of the work environment for creativity. The findings also indicate that the factors of the work environment that impede creativity, viz. workload pressure, and organisational impediment, are not associated with self-management leadership. These findings confirm the value of self-management leadership in innovative organisations and suggest the need for leadership strategies that encourage employees to manage their own behaviour, develop greater freedom, autonomy, and self-motivation that are most conducive to creativity.

Keywords: creativity, creative work environment, innovation, self-management leadership, United Arab Emirates.

The impact of self-management leadership on organisational creativity

John D. Politis

Higher Colleges of Technology, Dubai, United Arab Emirates
John.Politis@hct.ac.ae

Abstract

The objective of this paper was to empirically investigate through an industry survey, the impact of self-management leadership on the work environment dimensions that support creativity. The results of the study show a moderate and significant positive relationship between self-management leadership and the 'stimulant' dimensions of the work environment for creativity. The findings also indicate that the factors of the work environment that impede creativity, viz. workload pressure, and organisational impediment, are not associated with self-management leadership. These findings confirm the value of self-management leadership in innovative organisations and suggest the need for leadership strategies that encourage employees to manage their own behaviour, develop greater freedom, autonomy, and self-motivation that are most conducive to creativity.

1   Introduction

The competitiveness of an organisation depends on its ability to continuously adapt to new environments, develop new products, and create innovative ideas (Kay, 1993; Martensen and Dahlgaard, 1999). But how? Considerable evidence suggests that employees' creativity makes an important contribution to organisational innovation, effectiveness and survival (Kanter, 1983; Amabile, 1996; Ahmed, 1998). Therefore, organisations need to create a working environment (climate) that encourages employees' creative thinking and idea generation (Amabile, 1998;

Eyton, 1996; Goldsmith, 1996). In other words, for employees to be creative there must a work environment that supports the process of creativity.

Consequently, researchers have become increasingly interested in identifying the social and work conditions that influence employee creativity (Amabile, Conti, Coon, Lazenby and Herron, 1996; Oldham and Cummings, 1996). Theory and research suggest that employees will be creative when they have a shared commitment to their projects (Monge, Cozzens and Contractor, 1992; Payne, 1990), and when they are given adequate resources to conduct their work (Delbecq and Mills, 1985). Other areas of research revealed that employees would be creative when their work is intellectually challenging (Amabile and Gryskiewicz, 1987), and when they are given high level of autonomy and control over their own work (King and West, 1985). Last, but not least, ideas that are more creative are submitted to the organisation's suggestion program when supervisors are encouraging their employees to take risk (Cummings, 1966; Frese, Teng and Wijnen, 1999).

Although the review of the literature suggests that supportive supervision (Oldham and Cummings, 1996) and participative management style (Monge et al. 1992) fosters creativity, little is known on the affect of self-management leadership on the work environment dimensions that are most conducive to creativity. Current research lacks the empirical evidence supporting the relationship between the dimensions of self-management leadership and the determinants of the creative work environment. In particular, there is an interest from academics and practitioners in addressing whether self-management leadership behaviour enhances the work environment dimensions that foster creativity and innovation.

The goal of this study is to empirically examine the impact of the specific (first order factors) self-management leadership behaviours on the work environment dimensions that support creativity. The study involves a questionnaire-based survey of members of self-managing teams from a high technology organisation that is recognised for its creativity in the United Arab Emirates.

2   Literature review

2.1   Determinants of the work environment for creativity

All innovations begin with creative ideas. In the context of this research, the term 'creativity' is defined as the generation of ideas and innovation is the implementation of these ideas (Amabile et al. 1996). Thus, we consider employee creativity to be the production of ideas, products, or procedures that are (a) novel or original and (b) potentially useful to the organisation (Amabile, 1996). But what are the conditions (i.e. social and work) that influence employee creativity? What are the dynamic surroundings that support creativity? Over the years researchers and practitioners have examined the concept of creativity from different perspectives.

In early research, Barron (1955) and MacKinnon (1962) for example, focused on the personality traits of outstanding creative individuals. Research suggests that individuals with creative personalities exhibit higher creativity than those with less creative personalities (Feist, 1999). Moreover, research in social psychology suggests that supportive behaviour on the part of others in the work place (i.e. co-workers and supervisors) enhances employees' creativity (Amabile et al. 1996; Oldham and Cummings, 1996; Tierney, Farmer and Graen, 1999). In addition, the supportive behaviour of others outside the organisation (Koestmer, Walker and Fichman, 1999) has an impact on employees' creativity. For example, Walberg, Rasher, and Parkerson (1980) showed that individuals who were highly creative as adults typically received, as children, support from their parents. In relation to supportive behaviour, the literature also suggests that support from both work and non-work sources shapes employee moods that, in turn, affect their creativity (George and Brief, 1992). Extending this line of research, theoretical work suggests that when employees experience positive mood, their cognitive or emotional processes are enhanced such that they exhibit high levels of creativity (Isen, 1999).

As noted earlier, other areas of research have suggested that employees will be creative when they are given adequate resources to conduct their work (Delbecq and Mills, 1985); when their work is intellectually challenging (Amabile and Gryskiewicz, 1987); and when they are given high level of autonomy and control over their own work (King and West, 1985). In addition, the literature revealed that organisational support and evaluation of new ideas is necessary to encourage employees' creativity (Kanter, 1983). Rewards and bonuses were also reported as essential ingredients in the process of creating a creative work environment (Amabile et al. 1996).

On the other hand, it has been suggested that there are factors (i.e. internal political problems, conservatism and rigid formal structures) that could impede creativity amongst individuals (Amabile and Gryskiewicz, 1987). In a recent study Handzic and Chaimungkalanont (2003) found that informal socialisation had a stronger positive effect on creativity than organised (i.e. based on rigid formal structure) socialisation.

From the above discussion, it is important to realise that the 'story of creativity has many paths with no real conclusions'. Therefore, with so many different antecedents of creativity, where should organisations begin? What are the environmental variables that might influence employees' creativity in organisations? How organisations assess the various work environment dimensions that play a role in organisational creativity? Amabile and colleagues (1996) have drawn on the literature of creativity and developed an instrument which assesses the dimensions of the work environment that have been suggested in empirical research and theory as essential for organisational creativity. This instrument is referred in the literature as KEYS.

Eight determinants (dimensions) of the work environment for creativity are measured by KEYS. Of the eight, six are referred to as 'stimulant' dimensions and have a positive (+) influence on the creative work environment, while the remaining two are referred to as 'obstacle' dimensions and have a negative (-) effect (Amabile et al. 1996). The eight dimensions are:
organisational encouragement (+); supervisory encouragement (+); work group supports (+); freedom (+); sufficient resources (+); challenging work (+); workload pressure (-); and organisational impediments (-). The main areas covered by each determinant of the creative work environment are shown in the Appendix. However, these dimensions do not emerge spontaneously or in a vacuum. They evolve out of the context, the social and work conditions of the organisation and their impact is conditioned by the subjective perceptions of creative individuals whose experience is ruled by the history of their work environment.

This draws attention, among other things (i.e. support from work and non-work sources, employee moods, individuals' personal characteristics), to the roles played by leadership in developing and linking these perceptions for creativity. The creative problem-solving literature suggests that the creative performance of teams is enhanced by leadership interventions. The literature has indicated that a leadership role of a facilitative kind fosters the generation of new (creative) outputs (Ekvall, 1991; Osborn, 1963; Parners, 1992). Thus, there must be a dynamic interaction between leadership and creativity in a way of supporting, encouraging and

energising the perceptions and behaviours of employees that influence the creative work environment.

2.2   Self-management leadership

Leadership is defined broadly as influence processes affecting the choice of objectives of the group or organisation and the perceptions of followers (i.e. creative individuals) (Yukl, 1981). Various theories of leadership have emerged over the past fifty years. The most noticeable are: the classical Ohio Studies of initiating structure and consideration (Stogdill, 1974; Stogdill and Coons, 1957); the task-orientation and relationship-orientation leadership (Blake and Mouton, 1964); the participative leadership (Vroom and Yetton, 1973); and the transformational and transactional leadership (Bass, 1985). At approximately the same time as the transformational and transactional theory, a separate leadership approach, which focuses on 'self-management', has emerged (Manz and Sims, 1987). A review of the literature suggests that neither the classic Ohio two-factor leadership model, nor the Ekvall (1991) relationship-orientation and change-orientation leadership, can easily accommodate the facilitator kind of leadership that is needed for creativity. Although it is argued that creative leadership style seems to have much in common with Bass's (1985) transformational leadership (Rickards and Moger, 2000), there is no empirical research in support of this argument.

On the other hand, it is reported that participative leadership style fosters creativity (Monge et al. 1992), and employees are more creative when they are given high levels of autonomy (King and West 1985). Thus, it is reasonable to expect that the leadership style that focuses on specific techniques that encourage employees to develop greater autonomy, shared commitment, and self-motivation (Manz and Sims, 1987, 1989; 1993), is essential to influence the behaviour of employees in creating a creative work environment. The leadership style focusing on such specific techniques is known as 'self-management' leadership. For the purpose of this research then, the dimensions of self-management leadership were employed to predict the determinants of the creative work environment.

Self-management leadership dimensions were derived from Manz and Sims' (1986, 1987) theory and research. Their purpose is to measure those specific leadership dimensions that help and encourage employees to develop behaviours for greater autonomy, self-motivation and self-leadership. Manz and Sims (1987) developed the Self-Management Leadership

Questionnaire (SMLQ) as a measure of such leader dimensions. The six dimensions tapped by the SMLQ are:

- ***Encourage self-observation*** so that the members of a team can gather the information and the knowledge required in monitoring their performance.
- ***Encourage self-goal setting*** so that the members of a team set performance goals.
- ***Encourage self-reinforcement*** so that the members of a team recognise and reinforce their performance.
- ***Encourage self-expectation*** so that the members of a team have high expectations for performance.
- ***Encourage rehearsal*** so that the members of the team practice a task before performing it, and
- ***Encourage self-criticism*** so that the members of a team are self-critical and discourage poor performance.

In self-management leadership, leaders are facilitators, not heroes, and they "take inordinate steps to scout for the right mix of talents and coach each team member… they encourage team members to improve their inherent, and necessarily distinctive, talents" (Jassawalla and Sashittal, 2000: 39), i.e. 'creative talents'. Moreover, the rationale of creative leadership is to promote a positive climate akin to consideration and transformational leadership (Rickards and Moger, 2000). However, Manz and Sims's (1987) scales contain certain themes, such as motivation, trust and respect for people's ideas and feelings common to those measured by, Stogdill's (1963) consideration leadership dimensions and Bass's (1985) transformation leadership dimensions. Further, Jones (1996 indicated that a leader with hierarchical attitudes (i.e. diametrically opposite to creative leader) will create a rigid formal structure which blocks dialogue and hence creativity. It is thus reasonable to hypothesise that the factors representing the 'stimulant' components of the creative work environment will be more strongly, and more positively correlated with the factors of self-management leadership, than will be the factors representing the 'obstacle' components of the creative work environment. The assumed connectedness between self-management leadership and the determinants of the work environment for creativity is expressed in the following hypothesis.

Hypothesis: Correlations between each of the self-management leadership behaviours viz. encourage self-observation; encourage self-goal setting; encourage self-reinforcement;

encourage self-expectation; encourage rehearsal; encourage self-criticisms, and the 'stimulant' determinants of the creative work environment will be stronger, and more positive, than those with the 'obstacle' determinants of the creative work environment.

3   Subjects and procedure

3.1   Sample

The study focused in a service organisation operating in the United Arab Emirates (UAE), which is recognised for its creativity. Seven departments involved in communications technology have participated in the study. All respondents were full-time employees of the participating departments and volunteered to participate in the study. Questionnaires, written in English, containing items measuring the determinants of the creative work environment and self-management leadership were distributed to 162 members of self-managing teams in the seven departments. One hundred and four (104) employees returned usable questionnaires; yielding a 64.2 percent response rate. Most were from the new product development (53 percent), and customer service (19 percent) departments. The remaining ones were spread among various other areas including education/training, consulting, etc (28 percent). The majority were within the 21-30 age group (78 percent). Given the relatively young age of the sample, the level of work experience is accordingly low. Eighty seven (87) percent of the respondents have had four or less years of work experience. The respondents were 5 percent female and 95 percent males and all had attained some sort of technical or university qualification taught in the English language.

3.2   Analytical procedure

Confirmatory factor analyses (CFAs) were performed using the analysis of moment structures (AMOS, version 5) software (Arbuckle, 2003) for the factor analysis of the measurement models. Using CFAs, we assessed the validity of the measurement models of the variables used in the paper. A mixture of fit-indices was employed to assess the overall fit of the measurement models. The ratio of chi-square to degrees of freedom (χ^2/df) has been computed, with ratios of less than 2.0 indicating a good fit. However, since absolute indices can be adversely effected by sample size (Loehlin, 1992), four other relative indices (GFI, AGFI, CFI and TLI) were computed to provide a more robust evaluation of model fit (Tanaka 1987; Tucker and Lewis, 1973). For GFI, AGFI, CFI and TLI, coefficients closer to unity indicate a good fit, with acceptable levels of fit being above 0.90 (Marsh, Balla and McDonald, 1988). For RMR and

RMSEA, evidence of good fit is considered to be values less than 0.05; values from 0.05 to 0.10 are indicative of moderate fit and values greater than 0.10 are taken to be evidence of poorly fitting model (Browne and Cudeck, 1993).

Given adequate validity of those measures, we reduced the number of indicator variables by creating a composite scale for each latent variable (Politis, 2001). These scales were subjected to a series of correlational and regression analysis.

4   Results
4.1   Measurement models

As noted earlier, the variables that we measure on the survey are: encourage self-observation, encourage self-goal setting, encourage self-reinforcement, encourage self-criticism, encourage self-expectation, and encourage rehearsal and the determinants (perceptions), as rated by the employees, of the work environment for creativity.

Independent variables

Self-management leadership measures were assessed using Manz and Sims' (1987) 22 item Self-Management Leadership Questionnaire (SMLQ). The theory posits six dimensions of self-leadership behaviour (i.e. encourage self-observation, encourage self-goal setting, encourage self-reinforcement, encourage self-expectation, encourage rehearsal, and encourage self-criticism). The CFA results supported the validity of a six-factor model. These factors are: encourage self-observation (3 items, $\alpha = 0.77$), encourage self-goal setting (4 items, $\alpha = 0.90$), encourage self-reinforcement (4 items, $\alpha = 0.83$), encourage self-expectation (3 items, $\alpha = 0.80$), encourage rehearsal (4 items, $\alpha = 0.78$), and encourage self-criticism (4 items, $\alpha = 0.78$).

Dependent variables

Determinants of the work environment for creativity made up of eight subcategories, namely, organisational encouragement, supervisory encouragement, work group supports, freedom, sufficient resources, challenging work, organisational impediments, and workload pressure. These categories were assessed using Amabile et al.'s (1996) 66-item instrument (KEYS). The CFA results supported a six-factor model. The first being the factor of 'encouragement for creativity' (19 items, $\alpha = 0.91$), which consists of the original factors of organisational

encouragement, supervisory encouragement, and work group supports, and the factors of freedom (3 items, α = 0.69), sufficient resources (4 items, α = 0.73), challenging work (4 items, α = 0.80), workload pressure (3 items, α = 0.82), and organisational impediments (5 items, α = 0.67). Surpassingly, 28 items were dropped due to cross loading or poor loading. For the purpose of this study, the factors prescribed to be positively related to creativity (i.e. encouragement for creativity, freedom, sufficient resources, and challenging work) were treated as one variable and it is referred to as the 'stimulant factors' to creativity, and those to be negatively related (i.e. workload pressure and organisational impediments), were treated as the 'obstacle factors' to creativity.

The model of Figure 1 contains six self-management leadership dimensions, namely, encourage self-observation, encourage self-goal setting, encourage self-reinforcement, encourage self-expectation, encourage rehearsal, and encourage self-criticism. It also contains the stimulant and obstacle factors to creativity.

Self-management leadership dimensions   **Dimensions of the creativity work environment**
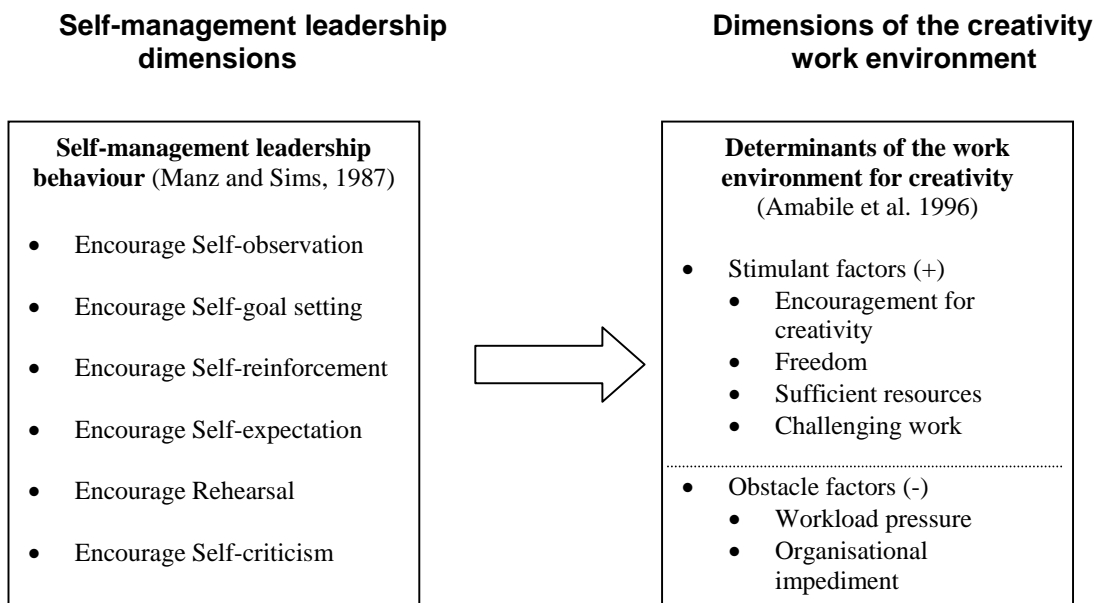
Figure 1   Summary of variables used in the paper

4.2   Hypothesis testing

A descriptive analysis of responses for self-management leadership dimensions and the stimulant and obstacle factors to creativity was performed first to identify any prevailing patterns.

The mean score, for encourage self-observation was 4.59 out of 7 (std.dev = 1.32, min = 2.00, max = 7.00); for encourage self-goal setting 4.45 (std.dev = 1.49, min = 1.50, max = 7.00); for encourage self-reinforcement 4.57 (std.dev = 1.34, min = 1.50, max = 7.00); for encourage self-expectation 4.98 (std.dev = 1.28, min = 1.33, max = 7.00); for encourage rehearsal 4.48 (std.dev = 1.29, min = 1.50, max = 7.00); and for encourage self-criticism 4.73 (std.dev = 1.19, min = 1.50, max = 7.00). This amounts to the majority of the mean scores lying somewhere between the high end of "uncertain" and "slightly true". The mean score for the *stimulant* factors to creativity was 2.68 out of 4 (std.dev = 0.52, min = 1.61, max = 3.80), and for the *obstacle* factors to creativity was 2.79 (std.dev = 0.55, min = 1.90, max = 3.80). This amounts to the majority of the mean scores lying somewhere between the high end of "sometimes" and "often".

The hypothesized relationship between self-management leadership and the determinants for creativity was tested using Pearsons's correlation coefficients. All six self-management leadership variables showed significant correlations with the *stimulant* factors of creativity ($\rho < 0.05$). The results indicate that the correlations between the self-management leadership variables and stimulant determinants of creativity are stronger, and more positive, than those with the obstacle determinants of creativity, supporting our hypothesis. Specifically, the results showed moderate positive correlations between the stimulant factors of creativity and encourage self-observation (r = 0.29); encourage self-goal setting (r = 0.32); encourage self-reinforcement (r = 0.30); encourage self-expectation (r = 0.28); encourage rehearsal (r = 0.33); and encourage self-criticism (r = 0.25). Moreover, the results showed non-significant and near zero correlations between the obstacle factors of creativity and encourage self-observation (r = 0.09); encourage self-goal setting (r = 0.06); encourage self-reinforcement (r = 0.10); encourage self-expectation (r = 0.08); encourage rehearsal (r = 0.08); and encourage self-criticism (r = -0.04).

In view of significant correlations between the variables, further tests were performed to identify the main factors affecting the determinants of the creative work environment. This analysis was performed using regression models. The regression results indicated that the independent variables jointly (self-management leadership) explained a quarter variance of the stimulant factors of creativity (R-square = 0.25, F = 5.8, $\rho < 0.05$). The remaining 75% are not explained. There was no significant direct effect found of the self-management leadership variables towards the obstacle factors of creativity (R-square = 0.02, F = 0.34, $\rho < 0.92$). In summary, the results of this study have shown that (a) there is a positive and significant relationship between

self-management leadership and the stimulant determinants of the work environment for creativity; and (b) the stimulant determinants of the work environment for creativity are more strongly associated with self-management leadership than the obstacle determinants of creativity.

5   Discussion

This paper addresses the impact of the specific (first order factors) self-management leadership behaviours on the determinants of the work environment conducive to creativity in the context of a high technology organisation which is recognised for its creativity. The findings are consistent with the realm of participative management style and employees' creative performance theories. The results of the study indeed reinforce Monge et al.'s (1992) suggestion that participative leadership fosters creativity.

The key finding of this study is undoubtedly that the leaders who encourage employees' self-leadership behaviour are most helpful to promote the stimulant work dimensions (i.e. encouragement for creativity, freedom, sufficient resources, and challenging work) that foster a creative working environment, as established by Amabile et al. (1996). Specifically, the six self-management leadership variables alone explained over 25% of the variance of the stimulant factors of creativity. This finding is particularly significant and important in the work environment for creativity landscape that is rich in theory and rhetoric, but scarce in empirical evidence. The findings suggest that it is the participative and self-management leadership style in organizations that enhances employees' 'stimulant' perceptions of the work environment for creativity. Such leadership, viz. creative leadership, creates a new work environment that gives employees creative freedom, support, encouragement and intrinsic motivation that are most conducive to creativity.

Furthermore, it is also important to note that the remaining 75% of the variance are not explained by the variables tested in this study. One could assume that a portion of the remaining variance could be explained by other leadership styles, such as Stogdill's (1963) consideration leadership and Bass's (1985) transformation leadership, both of which contain certain themes common to those measured by Manz and Sims's (1987) self-management leadership dimensions. In addition, another portion of the remaining variance could be explained by other antecedents to creativity, such as, the support individuals receive from parents when

there are children (Walberg et al. 1980); the employees' mood (Isen, 1999); and the employees' personality characteristics (Amabile, 1996; Feist, 1999). Thus, future research should estimate models that accommodate the creative leadership styles akin to the consideration factor of the Ohio studies, the transformational factor of the Bass's (1985) studies, and the self-management leadership factors of the Manz and Sims's (1987) studies, and the variables of personality characteristics; and employee's mood.

The findings also identified that some factors in the work environment that impede creativity, viz. obstacle factors (i.e. workload pressure, and organisational impediment) are not associated with self-management leadership. Specifically, self-management leadership variables alone did not explain any variance of the obstacle factors of creativity, viz. excessive workload pressure, internal strife, conservatism, and rigid, formal management structure. This finding is aligned with previous studies in that Jones (1996) suggested that a leader with hierarchical attitudes and behaviour (i.e. diametrically opposite to the self-management leader) will create an organizational structure and work environment, which re-enforces power-based relationships and one-way monologue, blocking dialogue, freedom and learning, and hence, creativity. Moreover, leaders with hierarchical attitudes and behaviour are likely to be perceived as a means of external control resulting in decreasing the intrinsic motivation that is necessary for creativity (Amabile, 1988; Deci & Ryan, 1985). This provides further support for the notion that self-management leadership strategies of encouraging employees for managing their own behavior to develop greater autonomy, shared commitment, and self-motivation (Manz, 1986; Manz & Sims, 1987), influence the levels of the perceptions of the work environment for creativity, as predicted by our theoretical model. Thus, professional development for creative leadership should be designed so as to include those attributes of character of a supportive-facilitative kind that provides employees with goal clarity, autonomy, freedom, intellectual stimulation and fair evaluation that are found conducive to creativity.

While this research has established a clear relationship between self-management leadership and the stimulant factors to creativity, some caution must be exercised when interpreting these findings due to a number of limiting factors. First, although a quantitative study is able to establish a relatively clear picture of relationships between phenomena, it is less apt at explaining the reasons behind it. Thus, future qualitative research needs to be considered to explore the exact reasons why self-management leadership tends to lead to stronger associations with the stimulant determinants of the work environment for creativity than with the

obstacle determinants for creativity. Other limitations include the use of a relatively undeveloped instrument measuring the perceptions of the creative work environment (note: 28 items were dropped from the measurement model due to cross or poor loading), inability to establish causality, and the relatively small sample size.

References

Arbuckle, J. L. (2003): *Analysis of moment structures (AMOS), user's guide version 5.0,* SmallWaters Corporation, Chicago, IL.

Ahmed, P. K. (1998): Benchmarking innovation best practices, *Benchmarking for Quality Management and Technology,* 5, 1, 48-58.

Amabile, T. M. (1996): *Creativity in context,* Boulder, CO: Westview Press.

Amabile, T. M. (1998): A model of creativity and innovation in organisations, in: B. M. Staw and L. L. Cummings (Eds): *Research in Organisational Behaviour,* 10 CT: JAI Press, Greenwich, 123-167.

Amabile, T. M., Conti, R., Coon, H., Lazenby, J., and Herron, M. (1996): Assessing the work environment for creativity, *Academy of Management Journal,* 39, 1154 -1184.

Amabile, T. M., and Gryskiewicz, S. S. (1987): *Creativity in the R &D laboratory,* Technical Report No. 30, Center for Creative Leadership, Greensboro, NC.

Barron, F. (1955): The disposition toward originality, *Journal of Abnormal and Social Psychology,* 51, 478-485.

Bass, B. M. (1985): *Leadership and performance beyond expectations,* Free Press, New York.

Blake, R. R. and Mouton, J. S. (1964): *The managerial grid,* Gulf Publishing Company, Houston, TX.

Browne, M. W., and Cudeck. R. (1993): Alternative ways of assessing model fit, in: Bollen, K. A. and Scott Long, J. (Eds.): *Testing Structural Equations Models*, Sage, Newbury Park, California, 36–62.

Cummings, L. L. (1965): Organisational climates for creativity, *Journal of the Academy of Management,* 3, 220-227.

Deci, E. L., and Ryan, R. M. (1985): *Intrinsic motivation and self-determination in human behaviour,* Plenum, New York.

Delbecq, A. L., and Mills, P. K. (1985): Managerial practices and enhance innovation, *Organisational Dynamics,* 14, 1, 24-34.

Ekvall, G. (1991): The organisational culture of idea management: A creative climate for the management of ideas, in: J. Henry and D. Walker (Eds.): *Managing Innovation,* Sage Publications, London, 73-79.

Eyton, R. (1996): Making innovation fly, *Ivey Business Quarterly,* 61, 1, 59.

Feist, G. J. (1999): The influence of personality on artistic and scientific creativity, in: R. Sternberg (Ed.): *Handbook of Creativity,* Cambridge, UK: Cambridge University Press, 273-296.

Frese, M., Teng, E., and Wijnen, C. J. (1999): Helping to improve suggestion system: Predictors of making suggestions in companies, *Journal of Organisational Behaviour,* 20, 1139-1155.

George, J. M. and Brief, A. P. (1992): Feeling good-doing good: A conceptual analysis of the mood at work-organisational spontaneity relationship, *Psychological Bulletin,* 112, 310-329.

Goldsmith, C. (1996): Overcoming roadblocks to innovation, *Marketing News,* 30, 24, 4.

Handzic, M. and Chaimungkalanont, M. (2003): The impact of socialisation on organisational creativity, in: the proceedings of *The 4th European Conference on Knowledge Management (ECKM 2004),* Oriel College, Oxford University, United Kingdom, 18-19 September, 425-432.

Isen, A. M. 1999): On the relationship between affect and creative problem solving, in: S. Russ (eds.): *Affect, Creative Experience and Psychological Adjustment,* Philadelphia: Brunner/Mazel, 3-17.

Jassawalla, A. R., and Sashittal, H. C. (2000): Strategies of effective new product team leaders, *California Management Review,* 42, 2, 34-51.

Jones, S. (1996): *Developing a learning culture,* McGraw-Hill, London.

Kanter, R. M. (1983): *The change masters,* Simon and Schuster, New York.

Kay, J. (1993): *Foundations of corporate success,* Oxford University Press, New York.

King, N., and West, M. A. (1985): *Experiences of innovation at work,* SAPU Memo No. 772, University of Sheffield, England.

Koestmer, R., Walker, M., and Fichman, L. (1999): Childhood parenting experiences and adult creativity, *Journal of Research in Personality,* 33, 92-107.

Loehlin, J. (1992): *Latent variables models,* Erlbaum, Hillside, N.J.

MacKinnon, D. W. (1962): The nature and nurture of creative talent, *American Psychologist,* 17, 484-495.

Manz, C. C. (1986): Self-leadership: Toward an expanded theory of self-influence processes in organisations, *Academy of Management Review*, 11, 585-600.

Manz, C. C., and Sims, H. P. Jr. (1986): Beyond imitation: Complex behaviour and affective linkages resulting from exposure to leadership training models, *Journal of Applied Psychology,* 71, 4, 571-578.

Manz, C. C., and Sims, H. P. Jr. (1987): Leading workers to lead themselves. The external leadership of self-managing work teams, *Administrative Science Quarterly*, 32, 106-129.

Manz, C. C., and Sims, H. P. Jr. (1989): *Superleadership: Leading others to lead themselves,*

Prentice-Hall, Englewood Cliffs, NJ.

Manz, C. C., and Sims, H. P. Jr. (1993): *Business without bosses: How self-managing teams are building high performance companies*, Wiley, New York.

Marsh, H. W., Balla, J. R., and McDonald, R. P. (1988): Goodness-of-fit indexes in confirmatory factor analysis: The effect of sample size, *Psychological Bulletin*, 103, 3, 391-410.

Martensen, A., and Dahlgaard, J. J. (1999): Strategy and planning for innovation management – supported by creative and learning organisations, *International Journal of Quality and Reliability Management,* 16, 9, 878-891.

Monge, P. R., Cozzens, M. D., and Contractor, N. S. (1992): Communication and motivational predictors of the dynamics of organisational innovation, *Organisational Science,* 3, 250-274.

Oldham, G. R., and Cummings, A. (1996): Employee creativity: Personal and contextual factors at work, *Academy of Management Journal,* 39, 607-634.

Osborn, A. F. (1963): *Applied imagination,* 3rd ed., Harper, New York.

Parnes, S. J. (1992): *Sourcebook for creative problem-solving,* Creativity Education Foundation Press, Buffalo, New York.

Payne, R. (1990): The effectiveness of research teams: A review, In M. A. West and J. L. Farr (Eds), *Innovation and Creativity at Work,* Wiley, Chichester, 101-122.

Politis, J. D. (2001): The relationship of various leadership styles to knowledge management, *The Leadership and Organizational Development Journal*, 22, 8, 354-364.

Rickards, T., and Moger, S. (2000): Creative leadership processes in project team development: An alternative to Tuckman's stage model, *British Journal of Management,* 11, 273-283.

Stogdill, R. M. (1974): *Handbook of leadership: A survey of the literature,* Free Press, New York.

Stogdill, R. M., and Coons, A. E. (1957): *Leader behaviour: Its description and measurement,* Bureau of Business Research, Columbus: Ohio State University.

Tanaka, J. S. (1987): How big is enough? Sample size and goodness-of fit in structural equations models with latent variables, *Child Development*, 58, 134-146.

Tierney, P., Farmer, S. M., and Graen G. B., (1999): An examination of leadership and employee creativity: The relevance of traits and relationships, *Personnel Psychology,* 52, 591-620.

Tucker, L. R., and Lewis, C. (1973): The reliability coefficient for maximum likelihood factor analysis, *Psychometrika*, 38, 1-10.

Vroom, V. H., and Yetton, P. W. (1973): *Leadership and decision making*, University of Pittsburgh, Press, Pittsburgh.

Walberg, H. J., Rasher, S. P., and Parkerson, J. (1980): Childhood and eminence, *Journal of Creative Behaviour,* 13, 225-231.

Yukl, G. A. (1981): *Leadership in organisations*, Prentice-Hall, Englewood Cliffs, NJ.

Appendix   Main areas of each determinant of the creative work environment

Supervisory encouragement (+)
- Goal clarity
- Supervisory support of ideas
- Open interaction between supervisors and subordinates

Work group supports (+)
- Background of individuals
- Intrinsic motivation
- Constructive criticism of ideas

Freedom (+)
- Relative high autonomy
- Control over work
- Choice on how to accomplish tasks

Challenging work (+)
- Assignment of challenging work

Creativity

Workload pressure (-)
- Some degree of pressure has a positive effect on creativity
- Extreme pressure undermines creativity

Organisational encouragement (+)
- Shared vision
- Risk taking
- Support and evaluation of ideas
- Recognition of ideas
- Collaborative idea flow

Sufficient resources (+)
- Adequate resource allocation
- Perception of adequate resources increases creativity

Organisational impediments (-)
- Internal political problems
- Conservatism
- Rigid formal structures
- Destructive internal competition

Adopted from Amabile et al. (1996)