Transformational and Transactional Leadership Predictors of the 'Stimulant' Determinants to Creativity in Organisational Work Environments

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Abstract: This paper examines the relationship between the leadership dimensions associated with Bass's (1985) model, and the 'stimulant' and 'obstacle' determinants of the work environment for creativity. There are three major findings in this research. First, the relationship between transformational and transactional leadership and the 'stimulant' determinants of the work environment for creativity is significant and positive. Second, the 'obstacle' determinants of the work environment for creativity are negatively related with both transactional and transformational leadership. Finally, transformational leadership is more strongly correlated than transactional leadership with the 'stimulant' determinants of the work environment for creativity. Thus, transformational leadership is an increasingly important aspect in today's organisations in creating a corporate culture and the work environment that stimulates employees' creativity and innovation.

Keywords: creative work environment ♦ innovation ♦ knowledge management ♦ organisational creativity ♦ transformational and transactional leadership.

1. Introduction

'Create, innovate or die!' That has increasingly become the rallying cry of today's managers. In a dynamic world of global competition, organisations must innovate and create new products and services and adopt state-of-the-art technology if they are to compete successfully (Kay, 1993; Richards, Foster & Morgan, 1998). In general usage, creativity means the ability of people, and hence the ability of employees, to combine ideas in a unique way or to make unusual associations between ideas (Amabile, 1996; Reiter-Palmon & Illies, 2004). Consequently, organisations need to create a climate that encourages and stimulates employees' creative thinking (Amabile, 1988; Goldsmith, 1996). In other words, organisations must try to remove work and organisational barriers that might impede creativity. By doing so, they may replace employees' traditional vertical thinking with zigzag or lateral thinking and might promote divergent thinking by breaking or even challenging the mental models in an individual, and sometimes treating problems as opportunities (Rickards, 1990).

As a result, researchers have become increasingly interested in studying environmental and work factors conducive to creativity and innovation (Amabile, Conti, Coon, Lazenby & Herron, 1996; Ford, 1996; Oldham & Cummings, 1996). Theory and research suggest that employees have creative potential if we can learn to unleash it. Creative potential might be unleashed when employees are given adequate resources to conduct their work (Delbecq & Mills, 1985), when their work is intellectually challenging (Amabile & Gryskiewicz, 1987), when they are given high level of autonomy and control over their own work (King & West, 1985), and when they given intrinsic task motivation (Robbins, 2003). In relation to leadership and intrinsic motivation, a study by Tyagi (1985) of 168 life insurance salespersons showed that supportive and facilitative leadership accounts for 38 percent of the variance in salespersons' extrinsic motivation and only 16 percent of their intrinsic motivation. Thus, one cannot immovably suggest that supportive leadership will enhance employees' creativity through intrinsic motivation. Moreover, although Amabile and Gryskiewicz (1987) revealed that leader's enthusiasm, interest, and commitment to new ideas and challenges encouraged scientists' creativity, leadership has not been treated as a particularly important influence on creativity (Mumford, Scott, Gaddis & Strange, 2002).

Overall, the literature linking leader behaviours to individual creative performance is scant (Amabile, Schatzel, Moneta & Kramer, 2004), and the literature linking transformational and transactional leadership to work environment dimensions that are most

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conducive to creativity and innovation is even smaller. To this end, this research started by asking the following questions. To what extent will leaders, who provide adequate resources and delegate authority to their subordinates, affect the determinants of the creative work environment, which in turn, affect creativity and innovation? Which leadership styles best supports the 'stimulant', and which, supports the 'obstacle' determinants of the work environment for creativity. Do leadership behaviours have at all an effect on removing work and organisational barriers that might impede creativity? The answers to these questions are some of the objectives of this paper.

The research reported in this study investigates the relationship between transformational and transactional leadership and the determinants of the creative work environment. The study involves a questionnaire-based survey of members of self-managing teams from a high technology organisation operating in the United Arab Emirates.

2. Literature review

2.1 Models of creativity – the work environment for creativity

Current views on organisational creativity focus on the outcomes or creative products (i.e. goods and services). A creative product is defined as one that is both (a) novel or original and (b) potentially useful or appropriate to the organisation (Amabile, 1996; Ford, 1996; Mumford & Gustafson, 1988). Various factors contribute to the generation of creative products, both at the individual and organisational levels (Mumford & Gustafson, 1988).

At the individual level, an extensive body of research suggests that individual creativity essentially requires expertise, creative-thinking skills, and intrinsic task motivation (Amabile, 1997). Expertise refers to knowledge, proficiencies, and abilities of employees to make creative contributions to their fields. Creative-thinking skills include cognitive styles, cognitive strategies, as well as personality variables that influence the application of these creative-thinking skills. Task motivation refers to the desire to work on something because it is interesting, involving, exciting, satisfying, or personally challenging. Task motivation is crucial in turning creative potential into actual creative ideas (Robbins, 2003). Studies confirm that the higher the level of each of these three components, the higher the creativity.

At the organisational level, researchers have also included individual characteristics as part of the broader framework explaining creativity in the work place. Woodman, Sawyer and Griffin (1993), included personality variables, cognitive factors, intrinsic motivation, and knowledge in their model of organisational creativity. Yet, 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 & Cummings, 1996; Tierney, Farmer and Graen, 1999). Other areas of research have suggested 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). Moreover, 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 & Gryskiewicz, 1987).

The above literature suggests that individual creativity is a complex phenomenon that is influenced by multiple individual-level variables as well as contextual and environmental variables. The focus then of individual creativity is on the specific contextual variable of leadership and on the theories of organisational creativity – the componential theory of Amabile (1988), the interactionist theory of Woodman et al. (1993), and the multiple social domains theory of Ford (1996) – all of which include the work environment as an influence on employee creativity.

In relation to the environmental variables, Amabile et al.'s (2004) componential theory of creativity is the only theory that specifies *creativity features* that contribute to the perceived work environment for creativity. But, how can organisations assess the dimensions of the perceived

work environment that might influence employees' 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 (Amabile, 1995). 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 determinants, and the main areas covered by each, are shown in the Appendix.

In relation to leadership it is suggested that leadership is a crucial variable contributing to the culture and climate of the organisation and perception of support for creativity and innovation (Amabile & Gryskiewicz, 1989; Cummings & Oldham, 1997; Mumford, Whetzel & Reiter-Palmon, 1997; Mumford et al. 2002). Therefore, 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 Specific leader behaviours and creativity

The literature over the past 30 years has documented the importance of perceived leader support for subordinate creativity (For a review, see Mumford et al., 2002). Studies have demonstrated that team members' collective view of support from their leader is associated with the team's success in creative endeavours (Amabile & Conti, 1999; Amabile et al. 1996). But which leadership style best supports subordinates' creative thinking? Is it the Stogdill's (1974) Ohio Studies of initiating structure and consideration? It is the Blake and Mouton's (1964) task-orientation and relationship-orientation leadership? Is it the Vroom and Yetton's (1973) participative leadership, or the Bass's (1985) transformational and transactional leadership?

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. The literature suggests that a leadership role of a facilitative kind fosters the generation of new (creative) outputs (Ekvall, 1991). It is also reported that supportive, no-controlling supervision, enhances creativity (Oldham & Cummings, 1996), and employees are more creative when they are given high levels of autonomy (King & West, 1985). From the above literature one can argue that creative leadership style seems to have much in common with Bass's (1985) transformational leadership (Rickards & Moger, 2000). It is thus, reasonable to expect that the leadership style that focuses on specific techniques, such as, involving employees in the decision-making process and problem-solving, empowering, and supporting them to develop greater autonomy, coaching and teaching them, and helping them to look at old problems in new ways (Burns, 1978; Bass, 1985, 1990), is essential to influence the behaviour of employees in creating a work environment conducive to creativity. The leadership style focusing on such specific techniques is known as 'transformational' leadership. Consequently, the dimensions of transformational and transactional leadership were employed to predict the determinants of the creative work environment.

2.2.1 Transformational and transactional leadership

Transformational and transactional leadership dimensions were derived from Bass's (1985) theory and research. Transformational leaders are those who "inspire followers to transcend their self-interests and who are capable of having a profound and extraordinary effect on followers" (Robbins, 2003: 343). On the other hand, transactional leaders are those who "guide or motivate their followers in the direction of established goals by clarifying role and task requirements (Robbins, 2003: 343). Bass (1985) developed the multifactor leadership questionnaire (MLQ-Form 5), which measures five leadership factors.

The five factors tapped by the MLQ-5 include: *charismatic behaviour, individualised consideration* and *intellectual stimulation*, forming the transformational leadership dimension. *Contingent reward* and *management-by-exception (MBE) passive*, forming the transactional leadership dimension. The following definitions are taken from Hater and Bass (1988: 696).

Transformational leadership

- *Charismatic behaviour*: 'the leader instills pride, faith, and respect, has a gift for seeing what is really important, and transmits a sense of mission'.
- *Individualised consideration*: 'the leader delegates projects to stimulate learning experiences, provides coaching and teaching, and treats each follower as individual'.
- *Intellectual stimulation*: 'the leader arouses followers to think in new ways and emphasises problem solving and the use of reasoning before taking action'.

Transactional leadership

- *Contingent reward*: 'the leader provides rewards if followers perform in accordance with contracts or expend the necessary effort'.
- *Management-by-exception passive:* 'the leader avoids giving directions if the old ways are working and allows followers to continue doing their jobs as always if performance goals are met'.

A review of the literature suggests that subordinates' creativity is a function of their perceptions of the general work environment for creativity, which is, in turn, a function of their relationship with the leader; a leader who is characterised by trust, mutual linking, and respect (Zhou & Shalley, in press). The foundation of creative leadership then is based on specific leader behaviours akin to relationship-oriented ("consideration") and transformational leadership (Rickards & Moger, 2000). Moreover, Jones (1996) suggested that the 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 transformational leadership, than will be the factors representing the 'obstacle' components of the creative work environment. The assumed connectedness between transformational leadership and the determinants of the work environment for creativity is expressed in Hypothesis 1.

Hypothesis 1: Correlations between each of the transformational leadership behaviours 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.

Moreover, Amabile and colleagues (2004) have provided empirical evidence suggesting that team leader supportive behaviour, which includes both task-oriented and relationship-oriented support, is an important aspect of the perceived work environment for creativity. It is thus plausible to predict that the factors representing the 'stimulant' components of the creative work environment will be more strongly, and more positively correlated with the factors of transactional leadership, than will be the factors representing the 'obstacle' components of the creative work environment. The assumed connectedness between transactional leadership and the determinants of the work environment for creativity is expressed in Hypothesis 2.

Hypothesis 2: Correlations between each of the transactional leadership behaviours 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 and procedures

Sample: The study focused in a service organisation operating in the United Arab Emirates (UAE). Nine departments involved in communications technology have participated in the study, all of which are recognised for their creativity. 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 the dimensions of transformational/transactional leadership were distributed to 173 members of self-managing teams in the nine departments. One hundred eighteen (118) employees returned usable questionnaires; yielding a 68 percent response rate. Most were from the new product development (57 percent), and customer service (17 percent) departments. The remaining ones were spread among various other areas including education/training, consulting, etc (26 percent). The majority were within the 21-30 age group (81 percent). Given the relatively young age of the sample, the level of work experience is accordingly low. Eighty two (82) percent of the respondents have had five or less years of work experience. The respondents were 6 percent female and 94 percent males and all had either a technical or university qualification taught in the English language. Anonymity was guaranteed and no names or other identifying information was asked.

Procedures: Survey questionnaires were pre-tested, using a small number of respondents (about one dozen; the pre-test participants did not participate in the final data collection). As a consequence of the pre-testing, relatively minor modifications were made in the written instructions and in several of the demographic items. The revised survey was then administered to the respondents of the nine departments in their natural work settings. Written instructions, along with brief oral presentations, were given to assure the respondents of anonymity protection and to explain (in broad terms) the purpose of the research. The participants were all given the opportunity to ask questions and were encouraged to answer the survey honestly; anonymity was guaranteed and no names or other identifying information was asked.

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, the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), the comparative fit index (CFI), and the Tucker and Lewis index (TLI) were computed to provide a more robust evaluation of model fit (Tanaka, 1987; Tucker & 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 & McDonald, 1988). For root mean square residual (RMR), and root mean square error approximation (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 a poorly fitting model (Browne & 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

The variables that we measure on the survey are: transformational and transactional leadership, and the determinants of the work environment for creativity.

4.1.1 Independent variables

Transformational and *transactional* leadership measures were assessed using Bass's (1985) 73-item multifactor leadership questionnaire (MLQ–Form 5). The MLQ-5 questionnaire employs a 5-point response scale (0 = not at all; 4 = frequently if not always) and consists of five subscales: three subscales forming the transformational leadership (i.e. charismatic behaviour, individualised consideration, and intellectual stimulation), and two subscales forming the transactional leadership (i.e. contingent

reward and management-by-exception). We conducted CFA of all MLQ items in order to check for construct independence .We first fit a five-factor model to the data, corresponding to that proposed by Bass. The fit indices of CFI, AGFI, CFI, TLI, RMR, and RMSEA were 0.91, 0.96, 0.97, 0.89, 0.05, and 0.07, respectively, suggesting that the five factor model provides a good fit. Thus, the data supported the independence of five factors, namely, charismatic behaviour (α = 0.91); individualised consideration (α = 0.85); intellectual stimulation (α = 0.78); contingent reward (α = 0.87); and management-by-exception (α = 0.67). Twelve items of the MLQ were dropped due to cross loading and/or poor loading of the order of, or less than 0.11.

4.1.2 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, workload pressure, and organisational impediments. These categories were assessed using Amabile et al.'s (1996) 66-item instrument (KEYS). The instrument employs a 4-point response scale (1 = never; 4 = always). We conducted CFA of all KEYS items in order to check for construct independence. We first fit an eight-factor model to the data, corresponding to that proposed by Amabile et al. (1996). The fit indices of CFI, AGFI, CFI, TLI, RMR, and RMSEA were 0.88, 0.90, 0.93, 0.89, 0.06, and 0.08, respectively, suggesting that the eight factor model provides a reasonable fit. Thus, the data supported the independence of eight factors, namely, organisational encouragement (8 items, α = 0.83), supervisory encouragement (7 items, α = 0.85), work group support (8 items, α = 0.77), freedom (3 items, α = 0.67), sufficient resources (5 items, α = 0.72), challenging work (4 items, α = 0.81), workload pressure (3 items, α = 0.80), and organisational impediments (7 items, α = 0.72). Twenty one items of the KEYS were dropped due to cross loading and/or poor loading of the order of, or less than 0.08.

Moreover, for the purpose of this study we created a "stimulant" index to creativity by averaging scores for organisational encouragement, supervisory encouragement, work group support, freedom, sufficient resources, and challenging work items (α = 0.88). In addition, we averaged scores from workload pressure and organisational impediments items to form the "obstacle" index to creativity (α = 0.71). The model of Figure 1 summarises the variables used in this paper.

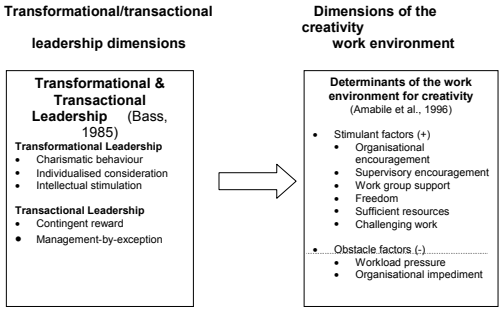

Figure 1: Summary of variables used in the paper

4.2 Hypothesis testing

Correlation analysis was used to examine the patterns of relationship between the leadership style dimensions and the determinants of the work environment for creativity. Table 1 reports the means, standard deviations, and the correlations among all variables included in the analyses.

There are several important observations regarding Table 1. First, it can be noted that all sub-scales display acceptable reliabilities, these being of the order of, or above, the generally accepted value of 0.70 (Hair, Anderson, Tathan & Black, 1995), with the exception of management-by-exception (α = 0.67). Second, the correlations between the constructs used in this study are generally lower than their reliability estimate, indicating good discriminant validity for these factors (Hair, et al., 1995).

Table 1: Means, standard deviations, and correlations of leadership and the determinants of the work environment for creativity

Latent variable	Mean[α]	SD	1	2	3	4	5	6	7
Transformational leadership									
Charismatic behaviour	1.93	1.08	**.91**[b]						
Individualised consideration	2.07	1.03	.82	**.85**					
Intellectual stimulation	2.01	1.06	.76	.69	**.78**				
Transactional leadership									
Contingent reward	1.91	1.05	.80	.84	.75	**.87**			
Management by exception (passive)	2.19	0.72	-.20	-.25	-.09	-.16	**-.67**		
Determinants of the creative work environment									
Stimulant determinant for creativity	2.71	0.49	.26	.38	.31	.22	.15	**.88**	
Obstacle determinant for creativity	2.71	.57	-.16	-.09	-.15	-.09	-.04	-.26	**.71**

[α] N = 118 individuals of self managing teams; [b] Coefficient alphas (αs) are located along the diagonal.
All correlations above 0.17 are statistically significant, $\rho < 0.01$; all correlations between 0.15 and 0.16 are statistically significant, $\rho < 0.05$.

As shown in Table 1, both hypotheses are supported by this data for both dimensions of the work environment for creativity. As predicted, the three transformational leadership variables showed significant correlations with the *stimulant* factors of creativity. The results indicate that the correlations between transformational leadership variables and the stimulant determinants of creativity are stronger, and more positive, than those with the obstacle determinants of creativity, supporting Hypothesis 1. (In fact, the correlations with the obstacle determinants of creativity are negative and non-significant.) Specifically, the results showed strong positive correlations between the stimulant factors of creativity and charismatic behaviour ($r = 0.26$, $\rho < 0.01$); individualised stimulation ($r = 0.38$, $\rho < 0.01$); and intellectual stimulation ($r = 0.31$, $\rho < 0.01$). Moreover, the results showed non-significant and negative correlations between the obstacle determinants of creativity and charismatic behaviour ($r = -0.16$); individualised stimulation ($r = -0.09$); and intellectual stimulation ($r = -0.15$).

Furthermore, results indicate that the correlations between transactional leadership variables and the stimulant determinants of creativity are stronger, and more positive, than those with the obstacle determinants of creativity, supporting Hypothesis 2. The results showed moderate positive correlations between the stimulant factors of creativity and contingent rewards ($r = 0.22$, $\rho < 0.01$); and management-by-exception ($r = 0.15$, $\rho < 0.05$), and negative, near zero, and non-significant correlations between the obstacle determinants of creativity and contingent rewards ($r = -0.09$); and management-by-exception ($r = -0.04$).

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 transformational variables jointly (i.e. charismatic behaviour, individualised stimulation, and intellectual stimulation) explained nearly a third variance of the stimulant factors of creativity (R-square = 0.29, $F = 4.7$, $\rho < 0.01$), while the transactional variables alone (i.e. contingent rewards, and management-by-exception) explained only 9% of the variance (R-square = 0.09, $F = 7.1$, $\rho < 0.05$). (Note that both of the independent variables jointly (i.e. transformational and transactional) explained just over a third variance of the stimulant factors of creativity (R-square = 0.34, $F = 3.6$, $\rho < 0.01$.)) There was no significant direct effect found of the transformational and transactional variables towards the obstacle factors of creativity (R-square = 0.07, $F = 2.16$, $\rho >$

0.05; R-square = 0.02, F = 1.17, $\rho > 0.05$, respectively).

5. Discussion

The need of organisations to be more competitive has sparked the interest of researches and practitioners to understand creativity in the workplace (Mumford et al., 2002). This study examined specific contextual variables of leadership and environmental variables that are conducive to creativity and innovation. Although replication of all research results is certainly desirable, the current study seems to highlight that both transformational and transactional leadership behaviour impact of the stimulant (i.e. organisational encouragement, supervisory encouragement, work group support, freedom, sufficient resources, and challenging work**)** determinants of the work environment conducive to creativity in an organisation (communications technology) which is recognised for its creativity. The findings are consistent with the realm of supportive management style and employees' creative performance theories. The results of the study reinforce the componential theory of Amabile (1988), and indeed go beyond prior research of particular areas of leader support, such as the leader's tendency to provide both clear strategic direction and procedural autonomy in carrying out the work (Pelz & Andrews 1976), or supportive, no-controlling supervision (Oldham & Cummings, 1996).

The key finding of this study is undoubtedly that the leaders, who see what is important, transmit a sense of mission, provide coaching/teaching, and arouse employees to think in new ways and emphasise problem solving, are most effective in facilitating the stimulant determinants of the creative work environment, as established by Amabile et al. (1996). Specifically, the three transformational leadership variables alone explained over 29% of the variance of the stimulant determinants 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 those particular transformational leader behaviours (i.e. charismatic behaviour, individualised consideration and intellectual stimulation) that appear to have the impact on the perceived work environment that influence employees' creative freedom, encouragement and intrinsic motivation for creativity. These leadership behaviours are indeed essential in the process of creating new knowledge, applying knowledge and in the words of Peter Druker (1993) "making it productive".

Furthermore, it is also important to note that the remaining 71% of the variance is 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 (1974) consideration leadership, and Manz and Sims's (1987) self-management leadership, both of which contain certain themes common to those measured by Bass's (1985) transformational leadership dimensions. In addition, another portion of the remaining variance could be explained by the subordinates' perceptions of themselves – particularly their competence and the value of their work (Amabile et al., 2004), the employees' mood (Isen, 1999); and the employees' personality characteristics (Amabile, 1996; Feist, 1999). Thus, future research should examine models that integrate the Ohio studies consideration leadership; the self-management leadership factor of the Manz and Sims's (1987) studies; the transformational/transactional leadership factors of the Bass's (1985) studies; the variables of personality characteristics; employee's mood; and the subordinates' perceptions of themselves.

This study also has implications for theories of leader behaviour. The classic two-factor theory of leader bahaviour (Fleishman, 1953) proposes that effective leaders must engage in both task and relationship management (i.e. initiating structure and consideration behaviours). Our findings showed that transformational leadership (comparable to consideration behaviour) is a better predictor of the stimulant determinants of the creative work environment than transactional leadership (comparable to initiating structure). It appears that *effective* creative leadership requires skills not only in managing both subordinate tasks and subordinates relationship, but also in

integrating the two simultaneously. Moreover, our findings indeed support the superiority of transformational over transactional leadership behaviour (Politis, 2002).

In summary, the results of this study have shown that (a) there is a positive and significant relationship between transformational/transactional leadership and the stimulant determinants of the work environment for creativity; (b) the factors representing transformational leadership are better predictors of the stimulant determinants of the creative work environment than those of transactional leadership; and (c) the obstacle determinants of the work environment for creativity are negatively associated with both transformational and transactional leadership.

6. Limitations and future work

While this research has established a clear relationship between transformational and transactional 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 transformational/transactional 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: 21 items were dropped from the KEYS measurement model due to cross or poor loading), inability to establish causality, and the relatively small sample size.

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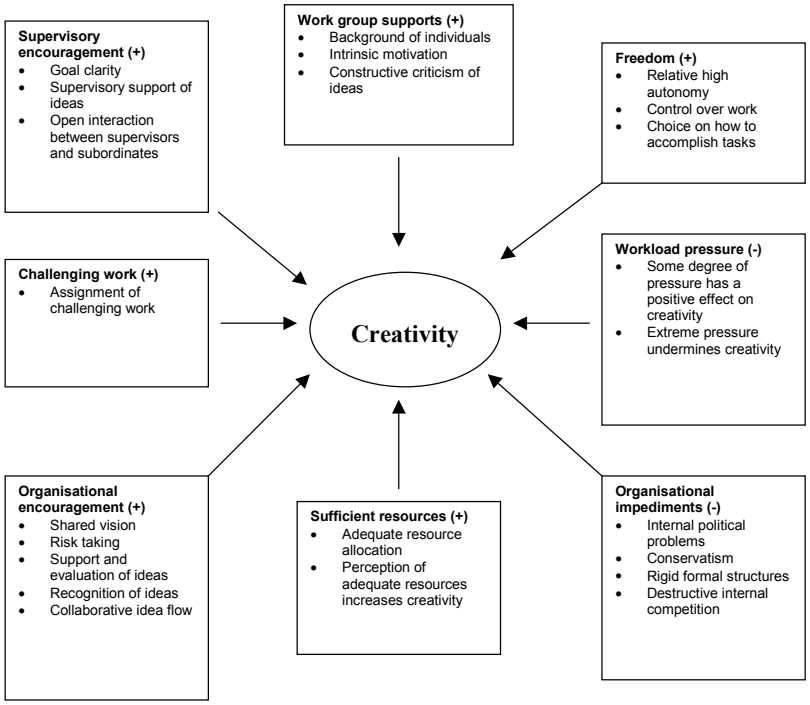
Appendix

Main areas of each determinant of the creative work environment



Adopted from Amabile et al. (1996)

Note:
'Stimulant' determinants of the creative work environment denoted with (+).
'Obstacle' determinants of the creative work environment denoted with (-).

