Factors affecting organisational creativity and innovativeness in Egyptian business organisations: an empirical investigation

Mohamed Mostafa
Department of Business and Public Administration, University of Sharjah, Sharjah, United Arab Emirates

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Abstract

Purpose – The overall purpose of this research is to further our understanding of how managers in Egypt perceive creativity and innovativeness. The paper also examines the construct validity of two measures of creativity and creativity barriers in order to gain further insights into the factors stimulating or hindering creativity in Egypt.

Design/methodology/approach – A sample of 170 managers was used to achieve the research purpose. Based on the upper-echelon perspective, the sample slightly favours high-level managers. Respondents completed a 77-item instrument designed to assess stimulants-to-creativity in the organisational workplace. A 17-item barriers-to-creativity instrument was also used to assess barriers to creativity in Egypt's organisations.

Findings – The study detected a statistically significant difference in attitudes towards organisational creativity based on the managers' functional areas in the organisation. The study also shows that the greater the education of the manager, the more he or she is likely to adopt creative and innovative activities. Using the *t*-test procedure, no generation gap was detected in the managers' attitudes towards organisational creativity. Finally, the study showed that male managers have significantly favourable attitudes towards creativity compared with their female counterparts.

Originality/value – This study has provided some insights into the factors associated with organisational creativity and creativity barriers in an Arab, non-Western context. The more is known of how managers perceive creativity, the more quickly and efficiently creativity can be stimulated, thereby allowing other global players to capitalise on opportunities for innovation and partnering that will emerge as markets open in the Middle East.

Keywords Creative thinking, Innovation, Egypt

Paper type Research paper

1. Introduction

Increasing global competition, coupled with rapidly changing technology and the shortening of the product life cycle, has made corporations more vulnerable to failure than at any time in the past. Therefore, it has become of the utmost importance of organisations to address issues creatively.

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Post-industrial organisations today are knowledge-based organisations and their success and survival depend on creativity, innovation, discovery and inventiveness. An effective reaction to these demands leads not only to changes, in individuals and their behaviour, but also to innovative changes in organisations to ensure their existence (Read, 1996). It appears that the rate of change is accelerating rapidly as new knowledge, idea generation and global diffusion increase (Chan Kim and Mauborgne, 1999; Senge *et al.*, 1999). Creativity and innovation have a role to play in this change process for survival (Martins and Terblanche, 2003).

Creativity may be the most important tool in a manager's arsenal. Without creativity, the firm becomes predictable. The predictable firm may be at a competitive disadvantage. Creativity goes further then creative managers seeking new solutions to product problems. Creativity can lead to new and better solutions to business and customer problems. Thus creativity may be the key to market success and improved operating efficiencies (Herbig and Jacobs, 1996). In fact, many researchers have noted that a focus on merely continuous improvement lacks vigour in the new world, since many companies are likely to confront competitors' innovations that undermine their area of competence (Kambil *et al.*, 2000). Continuous improvement provides a comfortable logic to gradual evolution and intellectual "safe harbour" for risk optimisation, but presents very limited forms of relative insights (Mascitelli, 2000). In turbulent organisational environments, competitive advantage is anchored in the company's ability to innovate its way temporarily out of relentless market pressures (Ghosal *et al.*, 1999).

The concepts of creativity and innovation are often used interchangeably in the literature. However, some authors may differentiate between the two concepts. Such authors usually consider "creativity" as an internal, and intellectual process of bringing about new ideas while "innovation" refers to the practical application of such ideas (Koontz *et al.*, 1980). Some definitions of creativity focus on the nature of thought processes and intellectual activity used to generate new insights to problems. Other definitions focus on the personal characteristics and intellectual abilities of individuals, and still others focus on the product with regard to the different qualities and outcomes of creative attempts (Arad *et al.*, 1997; Udwadia, 1990).

In fact, the term creativity, used in a workplace context, has many definitions and interpretations. Researchers, instructors, and consultants often explain it by referring to one or more of a variety of factors, including attributes, conceptual skills, behaviours, abilities, technologies, empowerment, the process of experience, or external influences. This lack of consensus is really not surprising; perhaps attempts to reach consensus are at odds with the very notion of creativity. However, if organisations want to encourage creativity, they must explore the range of identifying factors. This will permit managers to focus on the manifestations of creativity they believe are appropriate to their specific problems or situations (Gundry and Kickul, 1994).

Kao (1991, p. 14) suggests that creativity may be defined as "a human process leading to a result which is novel (new), useful (solves and existing problem or satisfies an existing need), and understandable (can be reproduced)". In this study creativity and innovation are used interchangeably, that is, innovation or creativity refers to a systematic development and practical application of a new idea.

Although there have been several studies concerning the issue of creativity and innovation, few authors have attempted to build an integrated framework of the

determinants of creativity and innovation. In this research, theoretical perspectives and research from disparate areas are integrated in order to develop a framework that specifies the factors contributing to creativity and innovation. By synthesizing different sources of information into a whole, interdisciplinarity provides a greater depth of understanding than any one method of study by itself.

The paper is organised as follows. Section 2 presents the major research objectives. Section 3 presents a brief review of creativity literature. Section 4 presents the research hypotheses. Section 5 deals with the data and methodology used to test the research hypotheses, while section 6 presents the results of the research. Research implications are presented in section 7. Finally, section 8 presents some of the research limitations.

2. Research objectives

One objective of this research is to investigate the Egyptian managers' perceptions of the factors affecting organisational creativity and innovativeness in the Egyptian business organisations. Another objective of this research is to test and validate the Arabic translations of two measures of attitudes associated with creativity and creativity barriers. Specifically, we aim to:

- Explore the major factors that affect organisational creativity in Egypt's business organisations.
- Analyse the impact of some job-related variables such as sex, age, and tenure on the attitudes towards creativity in Egypt's business organisations.
- Identify the job-related barriers to creativity as perceived by managers in the Egyptian business organisations.
- Test the validity and reliability of the recently developed KEYS and barriers to creativity (BTC) instruments in a non-Western culture. This study represents one of the first applications of the scales in the Arab world and, hence, the reliability and convergent validity of the instruments will be examined.

The overall purpose of this research is to further our understanding of how managers in Egypt perceive creativity and innovativeness. The more we know of how managers perceive creativity, the more quickly and efficiently creativity can be stimulated, thereby allowing other global players to capitalise on opportunities for innovation and partnering that will emerge as markets open in the Middle East.

3. Literature review

A large body of literature has focused on determining a set of personal characteristics and attributes associated with creative achievement (Barron and Harrington, 1981; Davis, 1989). This research has examined personal characteristics ranging from biographical factors to measures of cognitive styles and intelligence (Amabile, 1983; Barron and Harrington, 1981; Davis, 1989; Hocevar and Bachelor, 1989; Woodman and Schoenfeldt, 1989). In general, these studies have demonstrated that a stable set of core personal characteristics, including broad interests, attraction to complexity, intuition, aesthetic sensitivity, toleration of ambiguity, and self confidence, relate positively and consistently to measures of creative performance across a variety of domains (Barron and Harrington, 1981; Gough, 1979).

Prior research also examined organisational factors, such as job complexity and supervision style that facilitate creative performance (Amabile, 1988; Amabile *et al.*, 1996). Mott's (1972) comparative research showed that effective organisations are simultaneously efficient and creative. Efficiency means optimising, stabilizing, and polishing current methods and routines for highest quantity, quality, and customer satisfaction at the lowest cost possible. Organisational creativity means deliberately changing current methods to make new levels of quantity, quality, cost, and customer satisfaction possible. Both new methods and new products result from creativity.

Basadur *et al.* (2002) found that creativity can be developed, increased, and managed by organisations. Specific results from increasing organisational creativity can be identified, including new products and methods, increased efficiency, greater motivation, job satisfaction, teamwork, a focus on customer satisfaction, and more strategic thinking at all levels.

There is evidence that the functional cultures or the cultural aspects of whether one is viewed as a manager or as a non-manager within an organisation may affect one's attitudes towards creativity and innovativeness. Basadur *et al.* (1999) found that when compared to non-managers, managers display less positive attitudes towards creativity and divergent thinking. This may indicate that those in higher organisational positions may be more conservative than those in lower positions because they cannot afford to appear too adventurous or to be thought of as people who come up with new, unusual, "off-the-wall" ideas. Such behaviour might be associated with a lack of seriousness or dedication to the job at hand and could label the individual a bad risk taker or a dreamer.

Gender is one of the most important variables in creativity research literature (e.g. Fennema and Carpenter, 1998). Unfortunately, the literature on gender differences in attitudes towards organisational creativity is scarce. This is one of the research gaps that we aim to fill in this research.

Recently, researchers have applied chaos theory to study creativity (Remer, 1996; Simpson, 2002). Chaos theory has a history in the physical sciences and more recently in the social sciences (Murphy, 1996; Smethurst and Williams, 2001). This new paradigm aids in understanding how organisations self organise, adapt, change and renew. As a result, chaos theory introduces a new ontological orientation to understanding organisations. This new orientation has several general implications for understanding creativity (Cannibal and Winnard, 2001). Moreno (1993) saw the creative process as an interaction of established patterns (conserves) with the demands of a situation producing a spontaneous act. Creativity results from "chaotic" circumstances (i.e. bifurcation cascade), which is drastic reorganisation that is more revolutionary than evolutionary. Form a sociometric perspective, these shifts are the result of impulsive actions that violate the generally accepted parameters of a situation. If the system/pattern is to be stabilised again, a new conserve/strange attractor must be established, so the process can again fall within the spontaneous realm. Chaotic systems have sudden changes called bifurcations. Bifurcations are points at which "the system rearranges itself around a new underlying order, which may come to resemble, or be very different from, the prior one" (Wheatley, 1999, p. 97). Creative processes can be understood as bifurcation points. They often change the organisation and its operations significantly (Mostafa, 2001). Chaos theory gives a new viewpoint or added dimension to creativity research (Zausner, 1998).

While there is a large amount of research on creativity in the West, little research has been conducted to assess the factors affecting creativity in the Arab world and Egypt is no exception. Atiyya (1992) and Parnell and Hatim (1999) noted that there is a lack of empirical research into Arab management practices in general and creativity research in particular. The paucity of research on creativity in Egypt can be ascribed, among other things, to the traditional thinking about creativity prevailing in Arab culture. Creative research requires curiosity, adventurousness, and risk taking. These are comfortable traits for most Westerners but not for the typical Arab. Most Arabs prefer the comfort of proven ideas and shy away from exploring risky options. They seem to prefer a more structured, team-oriented approach to avoid losing face or being excluded. Despite this lack of academic attention to creativity in the Arab world, a few studies have focused on creativity and innovativeness.

A study by Makhamerah and Al-Dahhan (1988) examined factors affecting employees' innovation in public companies in Jordan. It concluded that innovation is affected by managerial attitudes, the establishment of objective criteria and encouragement of employees' interactions and exchange of ideas. Another study by Abu-Faris (1990) attempted to test the impact of certain factors on employees' innovation in a sample of public enterprises in Jordan. It found that material and non-material incentives affected positively employees' innovation. It also found no impact of sex and position on employees' innovation. Awamleh (1994) examined the relationship between managerial creativity (dependent variable) and sex, age, education, organisational level, and length of service as independent variables in a sample of 293 managers in Jordan. The study found that the most significant obstacles to creativity are those related to organisational climate. Mikdashi (1999) assessed the effects of organisational climate on managers' creativity in Lebanon. This study also investigated the constitutive meaning of creativity as a construct through the relation between creativity and other organisational constructs. Al-Beraidi and Rickards (2003) studied the creative team climate in Saudi Arabia. This study argued that creative performance of teams could be stimulated by leadership intervention. A transformational leadership style has been found the most appropriate in encouraging innovative behaviours. Abu-Taieh (2003) studied the relationship between leadership style and individual innovative behaviour. A sample of 430 managers from five large industrial firms in Jordan participated in the study. A statistically significant relationship was found between leadership power and individual innovative behaviour. However, no statistically significant relationship was found between legitimate and reward power, on one hand, and individual innovative behaviour on the other hand.

From this brief review we find that although numerous studies have attempted to identity the personal and organisational characteristics that predict creative accomplishment in the West, little research has focused on determining the factors that affect organisational creativity in the Arab world. Moreover, this brief review makes it clear that, in most previous research on organisational creativity, there has been a bias toward factors that appear to enhance creativity; there is comparatively little research evidence on factors that may undermine creativity. The purpose of this investigation is to address these issues. Therefore, we offer here a distinct contribution to the literature by forming a typology of the factors affecting creativity in the Arab

world. This classification will lead also to a better understanding of the job-related barriers to creativity in the Arab world.

4. Hypotheses development

Functional cultures have been found to influence managerial behaviour. Dearborn and Simon (1958) found that managers from different functional areas viewed the same managerial issues in significantly different ways. In fact, "they defined the problem largely in terms of the activities and goals of their own areas' (Hambrick and Mason, 1984, p. 199). Functional interpretation may result from "group think" which encourages individuals working closely to think the same way about issues (Janis, 1971).

Differences in functional approaches to creativity have been found in the literature. Singh (1990) found that marketing and operations managers are more likely to believe in violating organisational rules and organisational hierarchy to accomplish one's goals, and that finance managers are uncomfortable with ambiguity and expressed strong tendencies to follow rules. People in the management function have been shown to be more likely to adopt creative behaviours because they have positions within the organisational hierarchy that allow them to reward innovators and punish protectors of the status quo (Van de Ven, 1986). Technical people have been found to be more likely to adopt creative roles because innovation is an important part of many technical jobs (Chakrabarti, 1974). Accountants are rarely portrayed as heroic innovators (Kimball, 1997). This may, partly, be attributed to the presumption that the accounting profession is not regarded as creative one (Half, 1994; Sawyer, 1992; Sawyer and Vinten, 1996). Finally, people with science and engineering backgrounds tend to be more supportive of innovation and strategic change (Hambrick and Mason, 1984). It follows that:

H1. Managers from different functional areas will report statistically significant differences in attitudes towards organisational creativity and innovativeness.

Education has been found to be associated with a positive outlook toward creativity and innovation (Kimberly and Evanisko, 1981). The greater the education of a manger, the more he or she is likely to adopt innovative activities and the more he or she accepts ambiguity (Hambrick and Mason, 1984). It follows that:

H2. Highly-educated managers will report a positive outlook toward creativity and innovativeness compared to less-educated managers.

Younger and less experienced managers are more likely to pursue creative strategies since older mangers dislike change from the status quo and show greater adherence to the norms of the organisation (Hambrick and Mason, 1984). Work experience also gives individuals credibility as champions (Howell and Higgins, 1991) and makes them better able to navigate political coalitions in the organisation (Chakrabarti, 1974). It follows that:

H3. Younger managers will report more liberal attitudes towards organisational creativity and innovativeness than older managers.

Gender is important in studying organisational creativity since creativity requires many behaviour patterns in which men and woman differ. For example, Instone *et al.* (1983) found that men and women use different influence strategies in business activities and showed that men and woman have different norms about how rewards should be used to influence creative organisational behaviour. The importance of

examining creativity in relation to gender is based primarily on the socio-cultural differences among females and males (Abra, 1991). Traditionally, females in our society have been encouraged to conform, whereas males are expected to be active and dominant risk-takers (Block, 1976). Furthermore, Davis and Rimm (1989) acknowledge that most boys are provided with toys that enhance their visual-spatial abilities, such as trucks, and models, while Lever (1976) notes that the games of girls are often highly structured requiring turn-taking and rules. In addition, social expectations, conformity pressures and attitudes towards women in Arab countries may create "cultural blocks" to female creativity (Mostafa, 2003). It follows that:

H4. Male managers will report a positive outlook toward organisational creativity and innovativeness compared to female managers.

5. Method

5.1 Sample

Collecting data by mail surveys in the Arab world has been very difficult (Harzing, 1997; Nasif *et al.*, 1991). In order to ensure an acceptable number of responses, contacts were made with the top 100 listed companies in Egypt (*Business Today*, 2003) to secure their cooperation in collecting data from their managers. Of these firms, 34 agreed to distribute the survey instrument. The organisations include banks, major hospitality firms, and a number of industrial companies. A total of 300 questionnaires were distributed to mangers in these organisations. Confidentiality of responses was emphasized in the cover letter with the title "confidential survey", and in the text. To reduce social desirability artifacts (Chen *et al.*, 1997), the cover letter indicated that the survey seeks to determine "factors affecting creativity in Egypt's business organisations" and nothing else. Respondents were also given the opportunity to request an individualised report. A total of 178 responses were received by the cut-off date. A total of eight questionnaires were discarded because the respondents failed to complete the scales appropriately. The effective sample size, thus, was 170 with a response rate of 56 per cent. The sample slightly favours high-level mangers. This is based on previous research, which shows that one of the most important organisational variables affecting group innovation is managerial attitude toward innovation. This belief is based on the upper-echelon perspective (Hambrick and Mason, 1984), which emphasized the role of top managers' backgrounds, values and attitudes in explaining a wide range of organisational outcomes (Glunk *et al.*, 2001). Upper management may carry varying attitudes toward creativity and innovation. They may be conservative or they may encourage change (Dewar and Dutton, 1986). Mangers with favourable attitudes toward change foster an internal climate that is conductive to innovation and the continuous adoption of new ideas. The importance of positive attitudes toward change stems from the belief that such attitudes will provide the managerial support necessary for conflict resolution and coordination.

The characteristics of the sample are presented in Table I.

5.2 Measures

A number of measures have been developed that attempt to reliably assess factors affecting organisational creativity and innovativeness. The 24-item Basadur preference scale (Basadur and Housdorf, 1996) evaluates attitudes favourable to

Variable	Frequency	Valid (%)
Gender		
Male	104	61.2
Female	66	38.8
Level in organisation		
Top-chief executives or operating officers, presidents	21	12.4
Executive-vice presidents, directors, board level professionals	104	61.2
Middle plant managers, office managers	18	10.6
First-level forepersons, crew chiefs, section supervisors	19	11.2
Employees/machine operators, clerical, secretarial and support staff	8	4.7
Years of service in organisation		
<5	15	8.8
>5-< 10	40	23.5
>10-< 15	36	21.2
>15-< 20	29	17.1
>20	50	29.4
Age (years)		
≤25	18	10
26-30	39	23
31-35	30	17.6
36-40	32	18.9
41-45	22	12.9
>45	29	17.6
Function		
Administration/management	93	54.7
Engineering/product development	18	10.6
Legal affairs	12	7.1
Marketing/advertising	20	11.8
Accounting	27	15.9
Education		
Secondary	15	8.8
Vocational institution	10	5.9
University degree	90	52.9
Postgraduate (Master's)	43	25.3
PhD	12	7.1

Table I.
Characteristics of the sample

creativity (e.g. placing a high value on new ideas; believing that creative thinking is not bizarre). The scale consists of statements with which respondents express their degree of agreement/disagreement on a five-point scale ranging from strong agreement to strong disagreement. Items include "Creative people generally seem to have scrambled mind", "New ideas seldom work out", or "Ideas are only important if they impact on major projects". Factor analysis yielded three dimensions when the scale was administered to university students and young adults working in business settings: valuing new ideas, creative individual stereotypes, and too busy for new ideas. Test retest reliabilities of the three dimensions ranged from 58-63, while alpha coefficients ranged from 58-76. Basadur and Hausdorf reported validity coefficients involving correlations with other creativity test of about 25. Other measures include: the business organisation climate index (BOCI) (Payne *et al.*, 1971); creative climate questionnaire (CCQ) (Ekvall *et al.*, 1983); team climate inventory (TCI) (Anderson and West, 1994); and team factors inventory (TFI) (Rickards and Moger, 1999). From a study of the

social psychology of creativity, Amabile (1996) cites the three main origins of creative performance as: task motivation, domain-relevant skills and creativity relevant skills. She differentiates between intrinsic and extrinsic motivation, proposing that the intrinsic motivation enhances creativity, but that the extrinsic motivation can hamper it. Amabile also classifies specific environmental factors which affect an individual's inclination for creativity: group climate, freedom, autonomy, supervisor support and rewards. Her work has led to a tool called KEYS, designed to produce an inventory by assessing stimulants to creativity in the organisational workplace. The current KEYS database consists of 21,525 cases (Amabile *et al.*, 1996), hence, unlike other measures, this measure does not suffer from small sample bias.

KEYS instrument has 77 items and was factored into ten separate scales (Amabile *et al.*, 1996). It was concluded that "additional construct validity studies are needed" (Amabile *et al.*, 1996, p. 1179). Hence, we use KEYS instrument in this study since it becomes imperative to put in into factor analytic study to test the identification and nature of creativity in different cultures.

The questions for barriers to creativity and innovativeness were taken from Wong and Pang (2003) research instrument. The 17-item "barriers to creativity" (BTC) instrument was developed to assess barriers to creativity in Hong Kong organisations. Factor analysis of principal components analysis with varimax rotation was conducted and four major dimensions of barriers were identified (Wong and Pang, 2003). In this study we test the validity of this recently developed instrument in a different culture. This study represents the first application of the scale in the Arab world and, hence, the reliability and convergent validity of the BTC instrument will be examined.

Table II summarizes the main dimensions of these instruments.

5.3 Procedure

The Arabic version of the instruments was created through careful translation and back-translation techniques (Candell and Hullin, 1987; Thomas and Weigert, 1972). First, the author translated the instruments into Arabic. Then, these Arabic items wee back-translated into English by a bilingual expert to make sure that original content was kept in translation to decrease discrepancies between the English and Arabic measurements. No individual items were problematic in translation.

In translating the instruments items into Arabic, the author followed Malinowski's (1935) technique of translation which involves four steps:

(1) an interlinear, or word-by-world, translation;

(2) a "free" translation in which clarifying terms, conjunctions, etc. are added and world reinterpreted;

(3) an analysis and collation of the two translations; leading to

(4) a contextual specification of meaning.

However, it should be admitted that complete semantic equivalence in cross-cultural studies is a statistical fiction (Phillips, 1959).

6. Results

6.1 Validity and reliability

One of the objectives of this research was to test the validity and reliability of both KEYS and BTC in a non-Western context. A thorough reliability and validity analysis

Instrument/criteria	Basic scales/dimensions	Scaling method	Level of analysis
BOCI (Payne *et al.*, 1971)	17 scales including: Orientation to information technology Sociability Intellectual orientation Readiness to innovate	Four-point response scale	Organisation
CCQ (Ekvall *et al.*, 1983)	Ten dimensions including: Challenge Freedom Trust/openness Idea support Conflicts	Four-point response scale	Organisation
TCI (Anderson and West, 1994)	Participative safety Support for innovation Vision Task orientation	Ten-point response scale	Team
KEYS (Amabile *et al.*, 1996)	Stimulant scales Obstacle scales Criterion scales (creativity and productivity)	Four-point response scale	Organisation
BPS (Basadur and Housdorf, 1996)	Attitudes favorable to creativity	Five-point response scale	Organisation
TFI (Rickards and Moger, 1999)	Team factors Team leadership Team performance (creativity and productivity)	Five-point response scale	Team
BTC (Wong and Pang, 2003)	17 items including: Lack of peer cohesion Risk aversion Destructive criticism Time pressure	Five-point response scale	Organisation

Table II.
Main dimensions of reported inventories

on measurement instruments in empirical research is essential for several reasons. First, it provides confidence that the empirical finding accurately reflect the proposed constructs. Second, empirically-validated scales can be used directly in other studies in the field for different populations and for longitudinal studies (Flynn *et al.*, 1994).

The KEYS instrument was factor analysed by principal component analysis. In factor analysis, a rotation procedure is commonly applied which maximises the correlations of each item on a factor (Comrey, 1973). The KEYS construct comprises many interrelated items and, therefore, oblique rotation was applied as the rotation procedure. Advocates of oblique rotation assert that in the real world important factors are likely to be correlated; thus, searching for unrelated factors is unrealistic (Dixon, 1993).

Factor analysis highlighted an eight-factor solution with 88.3 of the variance explained. The pattern matrix (Table III) indicated that all of the item loadings for each factor were above 0.43. The Kaiser-Mayer-Olkin (KMO) measure of sampling adequacy was used to measure the adequacy of the sample for extraction of the eight factors. The KMO value of 0.68 is generally considered acceptable (Kim and Mueller, 1978).

Bartlett test of sphericity was used to test the multivariate normality of the set of distributions. This procedure also tests whether the correlation matrix is an identity matrix (factor analysis would be meaningless with an identify matrix) A significance value < 0.05 indicates that the data do not produce an identity matrix or differ significantly from identity (George and Mallery, 2000). The analysis focusing on the sphericity of the distribution (Barlett's sphericity test) allowed us to reject the hypothesis according to which the matrix would be unitary ($p < 0.001$). This result implies that the data are thus approximately multivariate normal and acceptable for factor analysis.

The eight factors were designated as:

- Factor 1: supervisory encouragement (SUP).
- Factor 2: freedom (FRD).
- Factor 3: organisational encouragement (ORG).
- Factor 4: productivity (PRO).
- Factor 5: organisational impediments (IMP).
- Factor 6: work group supports (GRP).
- Factor 7: sufficient resources (RES).
- Factor 8: top management support (TMS).

Comparing the results of Amabile *et al.* (1996) with the findings of this study suggests that other factors (challenging work and workload pressure) may have different meaning to Americans not shared by Arabs. Based on these results, it becomes evident that KEYS instrument is factorially complex. If this is so, it is equally evident that the construct validity of creativity in different cultures is seriously in question and further research is needed in different lines of business and across boundaries (Mikdashi, 1999).

The barriers-to-creativity instrument was also subjected to factor analysis in order to discover the underlying dimensions that exist in the working environment in Egypt about barriers to creativity. The extracted four factors explained a cumulative variance or 83.2 per cent. The pattern matrix (Table IV) indicated that all of the item loadings for each factor were above 0.55 (KMO = 0.76, Bartlett's test of sphericity = 5, 502, 136 is significant at $p < 0.001$).

Q[a]	SUP	FRD	ORG	PRO	IMP	GRP	RES	TMS
1		0.785						
2								0.626
3					0.680			
4					0.778			
5								0.548
6						0.470		
7								−0.693
8			0.702					
9	0.557							
10					0.866			
11								−0.636
12		0.542						
13				0.599				
14			−0.873					
15						0.533		
16					−0.617			
17					0.817			
18			−0.555					
19						0.756		
20					0.605			
21	0.549							
22			0.813					
23		0.481						
24					0.892			
25								
26							0.653	
27	0.758							
28			0.850					
29						0.403		
30					0.756			
31					0.804			
32							0.696	
33	0.626							
34					0.561			
35			0.532					
36								0.527
37	0.765							
38								−0.945
39					−0.419			
40			−0.814					
41						0.790		
42			0.797					
43					0.769			
44		−0.878						
45			0.675					
46							0.737	
47								−0.644
48				0.576				

Table III.
Rotated component matrix (KEYS instrument)

(*continued*)

Q[a]	SUP	FRD	ORG	PRO	IMP	GRP	RES	TMS
49			0.591					
50			0.498					
51	0.609							
52								−0.832
53								−0.516
54				0.819				
55								0.625
56			−0.492					
57								
58							0.830	
59	0.803							
60	0.501							
61			−0.437					
62			0.817					
63							0.597	
64			0.759					
65				0.550				
66					−0.605			
67						0.603		
68	0.691							
69								−0.556
70					0.682			
71				0.812				
72	0.443							
73	0.503							
74				0.641				
75							0.694	
76								0.533
77					−0.659			

Note: [a] Text of questions may be found in Appendix 1

Table III.

Using SPSS, an internal consistency analysis was performed to assess the reliability aspect of the KEYS and BTC instruments. Reliability refers to instrument's ability to provide consistent results in repeated uses (Gatewood and Field, 1990). Coefficient (Cronbach's) alpha is the basic measure for reliability (Green *et al.*, 2000). The items in each factor were grouped into scales, and coefficient alpha was calculated for each group. The KEYS instrument had an acceptable coefficient alpha ($\alpha = 0.81$) and the BTC also had an acceptable reliability score ($\alpha = 0.91$). Nunally (1978) suggested that in exploratory research such as this, alpha value of 0.6 is sufficient. The alpha values found for each scale indicated, therefore, that each instrument is a sufficiently reliable measure.

Based on the results of the statistical analyses, the KEYS and the BTC appear to be fairly valid and reliable measures of organisational creativity.

Following the factor analysis, ANOVA and independent samples *t*-test were used to test the research hypotheses.

6.2 Functional areas hypothesis

It was hypothesized that managers from different functional areas will report statistically significant differences in attitudes towards organisational creativity and

Q[a]	Component 1	2	3	4
1	0.863			
2	0.699			
3	0.924			
4	0.791			
5		0.706		
6	0.766			
7		−0.688		
8				−0.738
9			−0.713	
10		0.641		
11			0.867	
12	0.923			
13	0.915			
14		0.890		
15		0.699		
16	0.766			
17				0.553

Table IV.
Rotated component matrix (BTC instrument)

Note: [a] Text of questions may be found in Appendix 2

innovativeness. To test this hypothesis an ANOVA test was performed. Because the overall *F*-test was significant as shown in Table V, follow-up tests were conducted to evaluate pair-wise differences among the means. Scheffe test was chosen for *post hoc* comparisons because it is the most conservative and most flexible of the popular methods (Tabachnick and Fidell, 2001).

Table VI shows that there exists a significant difference between the means of general managers (ADM) and engineers/product development managers (ENG) and between ADM and marketing/advertising managers (MAR). There is also significant difference between ENG and accountants (ACC), between MAR and ACC and between MAR and ACC. The highest mean difference was found to be between marketing managers and accountants.

This result corroborates previous research which generally shows that accounting profession is not regarded as a creative one as it is governed by a set of standards issued by professional bodies (e.g. Sawyer and Vinten, 1996). Moreover, in some cultures, the interpretation is informed by the connotation of "creative accounting" which has come to be commonly used with pejorative or cynical connotations (e.g. Naser, 1993).

6.3 Education hypothesis

Using the ANOVA procedure (Table VII) it was found that there is significant difference among the mean scores toward creativity according to the educational level

	Sum of squares	df	Mean square	*F*	Sig.
Between groups	4.251	4	1.063	12.993	0.000
Within groups	13.496	165	0.08179		
Total	17.747	169			

Table V.
ANOVA (functional areas hypothesis)

(I) JOB	(J) JOB	Mean difference (I-J)	Sig.
ADM	ENG	−0.2533*	0.022
	LAW	0.0723	0.953
	MAR	−0.3861*	0.000
	ACC	0.1502	0.210
ENG	ADM	0.2533*	0.022
	LAW	0.1809	0.579
	MAR	−0.1329	0.737
	ACC	0.4034*	0.000
LAW	ADM	0.0723	0.953
	ENG	−0.1809	0.579
	MAR	−0.3138	0.070
	ACC	0.2225	0.283
MAR	ADM	0.3861*	0.000
	ENG	0.1329	0.737
	LAW	0.3138	0.070
	ACC	0.5363*	0.000
ACC	ADM	−0.1502	0.210
	ENG	−0.4034*	0.000
	LAW	−0.2225	0.283
	MAR	−0.5363*	0.000

Notes: ADM = administration/management; ENG = engineering/product development; LAW = legal affairs; MAR = marketing/advertising; ACC = accounting. * The mean difference is significant at the 0.05 level

Table VI.
Scheffe test for multiple comparisons (functional areas)

	Sum of squares	df	Mean square	*F*	Sig.
Between groups	6.815	4	1.704	25.717	0.000
Within groups	10.931	165	0.0663		
Total	17.747	169			

Table VII.
ANOVA (education hypothesis)

of the manager. Scheffe test (Table VIII) shows that the greater the education of a manager, the more he or she is likely to adopt creative and innovative activities. This result supports *H2*, which states that " highly-educated managers will report a positive outlook towards creativity and innovativeness compared to less-educated managers". This result confirms the fact that education achievements may open more options for individuals to select from and may enhance flexibility in collecting and processing information.

6.4 Age hypothesis

Using the *t*-test procedure (Table IX), it was found that the mean scores for younger and older managers are almost identical. Hence, *H3* cannot be accepted as no generation gap was detected ($t = 0.239$, 168 and $p > 0.05$). This result contradicts previous research conducted in the West (e.g. Hambrick and Mason, 1984) which generally shows that older mangers dislike change from the status quo and show greater adherence to the norms of the organisation unlike younger and less experienced managers who are more likely to pursuer creative strategies. This result may be

(I) EDU	(J) EDU	Mean difference (I-J)	Sig.
SEC	VOC	−0.5908*	0.000
	UNI	−0.6179*	0.000
	PGD	−0.2408	0.075
	PHD	−0.5825*	0.000
VOC	SEC	0.5908*	0.000
	UNI	0.0270	0.995
	PGD	0.3500*	0.000
	PHD	0.0083	0.990
UNI	SEC	0.6179*	0.000
	VOC	0.0270	0.995
	PGD	0.3771*	0.000
	PHD	0.3540	0.983
PGD	SEC	0.2408	0.075
	VOC	−0.3500*	0.000
	UNI	−0.3771*	0.000
	PHD	−0.3417*	0.000
PHD	SEC	0.5825*	0.000
	VOC	0.0083	0.990
	UNI	0.0353	0.983
	PGD	0.3417*	0.000

Table VIII.
Scheffe test for multiple comparisons (education)

Notes: SEC = secondary; VOC = vocational; UNI = university; PGD = postgraduate (Master's); PHD = Doctorate. * The mean difference is significant at the 0.05 level

Age (years)	*n*	Mean	Std deviation	*t*	df	Sig. (two-tailed)
<35	87	2.5223	0.3213	0.239	168	0.812
>35	83	2.5103	0.3288			

Table IX.
Independent *t*-test (age hypothesis)

interpreted in the wider context of the Arab culture and thinking. According to Barakat (1993), the traditional culture, which is the dominant one in the Arab World, is characterised by the following facets: Fatalism strengthened by conventional religious though; shame as apposed to guilt, reflected in the psychological drive to escape or prevent negative judgment by others rather than conscious questioning; conformity as apposed to creativity, which legitimises the status quo.

In many Arab countries, including Egypt, the job market is limited and is characterised by high competition, especially among educated employees. This limit chances for mobility and reduces opportunities for advancement (Al-Rasheed, 2001). In turn, this contributes to explaining the tendency among both younger and older managers to legitimise the status quo. With only 6 per cent of its land inhabited – predominantly that which is around the Nile valley – Egypt is a relatively less mobile society, a phenomenon which helps explain many of the prevailing attitudes towards creativity.

6.5 Gender differences hypothesis

t-tests (Table X) show that male managers have significantly favourable attitudes towards creativity compared to their female counterparts. This result supports *H4*

($t = 5.04$, 168 and $p < 0.001$). Such an outcome reflects cultural characteristics that encourage females in Arab society to conform, whereas males are expected to be active and dominant risk-takers. Arab societies seem to be reluctant to abandon their traditional viewpoint of women primarily committed to the house and children (Abdalla, 1996; Mostafa, 2003). Most Arab men consider households and domestic activities suitable for women and most Arab families educate their sons rather than their daughters on the assumption that boys are a greater economic asset than girls (El-Ghannam, 2001, 2002). As a result of these traditional viewpoints towards women in Arab societies, it is plausible that the gender differences in attitudes towards organisational creativity are determined, in part, by different identifications of the gender roles.

6.6 Barriers to creativity

Four factors emerged and they were (see Table V) as follows:

6.6.1 Factor 1: low commitment to organisation and lack of management support. Eight statements were loaded into this factor with very high reliability at 0.93, and an overall mean value of 3.26. The eight statements could be divided into two groups. The first group included statement on lack of communication and groups conflicting goals and objectives and rules and regulations to follow. All these being grouped together showed the system of the company. The second group included statement on not feeling involved and feeling not supported by the management.

Employees no feeling involved continuously reduced their commitment to the organisation. If the working atmosphere led to low morale, employees would become less committed to the organisation and it would directly discourage them from being creative. They would not want to serve the company whole-heartedly, nor would they like to help the company which creative thinking.

6.6.2 Factor 2: risk aversion and time pressure. Five statements were loaded into this factor with reliability alpha at 0.84. It attained the lowest mean value of 2.89 amongst the four factors of barriers to creativity. In view of these five statements, they were also divided into two groups. The first group included statements of risk aversion and destructive criticism. Risk aversion is deeply rooted in Arab culture and researchers (e.g. Al-Nimir and Palmer, 1982; Ali and Krishnan, 1997) have reported that Arab managers are risk avoiders.

The second group has direct relationship with time pressure. Excessive workload dominated most of the employees' time and in fact no spare time was availably for them to settle down and think of any creative idea for talking the problem. These findings are similar to that of Amabile's (1988) who also notes that the strategy of "fire-fighting" was frequently used to solve the immediate problem promptly. Employees were busy tackling the problems all the time and that created a hindrance to creativity.

Sex	*n*	Mean	Std deviation	*t*	df	Sig. (two-tailed)
Male	104	2.6114	0.2198	5.04	168	0.000
Female	66	2.3704	0.4011			

Table X.
Independent *t*-test (gender hypothesis)

6.6.3 Factor 3: threatening evaluation. Two statements were loaded into this factor with high reliability at 0.85. It attained one of the highest means amongst the four factors of barriers to creativity (3.04). Both statements shared one common characteristic in that they all have direct relationship with maintaining the status quo.

6.6.4 Factor 4: rigid rules. Two statements were loaded into factor 4 with reliability alpha 0.71. Its overall mean value was 3.12. These two statements included fear of failure and rules and regulations to follow. Management has a tendency to preserve the established traditions, and therefore many rules and standard procedures were set for the employees to follow and keep them under control. In fact, corporate bureaucracies often became rigidly formal and might greatly inhibit creativity (Weiner, 2000). "Although no manager wanted his or her own freedom on initiative reduced, it was an unusual manager who did no attempt to routinise the areas under his or her control" (Adams, 1986, p. 149). As stated by Gurteen (1998, p. 9) "Fear is one of the more common blocks on creativity-the fear of getting it wrong, losing face making a fool or oneself, failure. In the Western culture such fear is crippling enough, but in other cultures it is cultures it is far worse." The situation clearly identified that fear was common in the Arab culture, and it was sure that fear of change was one of the main barriers blocking creativity in the working environment.

7. Implications

This study has provided some insights into the factors associated with organisational creativity and creativity barriers. We found risk aversion to be one of the major creativity barriers. This result supports Ali's (1993) study which found that Arab managers scored low on overall attitudes to risk and were generally risk averse. In light of this finding, senior management must promote an organisation-wide view that personal risk-taking is encouraged and mistakes are something from which learning and new ideas can result. The way in which mistakes are handled in organisations will determine whether personnel feel free to act creatively and innovatively. Mistakes can be ignored, covered up, used to punish someone or perceived as a learning opportunity (Brodtrick, 1997). Tolerance of mistakes is an essential element that promotes creativity and innovation.

The coercive style of management is a common phenomenon in Egypt (Bakhtari, 1995). The coercive or authoritative manner is a style involving clear instruction to subordinates without listening to or permitting much subordinate input. Immediate compliance and obedience are expected and tight control is maintained. Egyptian firms tend to be extremely formalised and bureaucratic. In organisations characterised by coercive management, according to the Western management perspective, a high level of negative energy grows. People use their creativity to work against autocratic leaders or in spite of them; they refuse to contribute positively to the organisation (Wheatley, 1999). As the consultative environment is deeply engrained in the Arab Muslim mind and the Qur'an indicates that rewards will be for "those whose affairs are a matter of counsel between them" (Naqvi, 1981), senior management should promote a consultative environment. Such an environment can nurture the creativity and originality so vital for business success today. A major implication here is that the climate for creativity needs to be responsive to the whole process. However, a firm's climate is one of the most difficult development areas to change ad always needs total commitment and involvement from top management.

With respect to providing an enabling environment, the characteristics of the Arab culture relating to power distance and hierarchy imply that senior managers must be deeply committed to improving the environment for creativity. They must recognise the true implications of consultation and must implement a more consultative style of management. If typically risk-averse Arab employees are not provided active encouragement and do not see that their input is valued and acted upon, they will be reluctant to provide it.

In contrast to Western individualistic culture, the Egyptians are an extremely collectivistic people (Hofstede, 1980) and there is ease in social interactions and formation of groups. This collectivism can result in strong group loyalty and cohesiveness (Ali, 1993) and is a potential source of beneficial "social capital" – the resources derived from the network of relationship in a workgroup or organisation (Napahiet and Ghoshal, 1998). Egyptians value the person and the relationship more than the task. The challenge for an Egyptian work team, then, is maintaining a focus on powerful influence on group performance. While this can be positive, it can simultaneously limit the group's openness to alternative ways of doing things. Our results would imply that employee teams should be allowed to decide how to achieve their goal; permitting such freedom and autonomy makes intrinsic motivations soar. Based on research studies of Arab managers and workplace environments, however, it is not at all clear whether this effect would occur in the high power distance of Arab culture. Another implication here is that rather than focusing on outcomes, managers should focus on how people are approaching the work and the strategies being used, providing coaching to overcome problems and clarify approach. Zuckerman (1978) found that successful scientists typically had mentors – more senior scientists – who not only imparted knowledge but also strategies and methods for approaching problems.

Rigid rules were found to be inversely related to creativity and innovation. According to chaos theory, change is constant, its consequences unforeseen and not subject to control or accurate prediction. Staying the same or going through too much change is courting disaster. A certain amount of instability or change is essential for change, so Egyptian managers should stay flexible and be willing to manage creatively without rigid rules. At times, things in organisations may seem quiet and calm. Yet, at other times, an iterative process suddenly takes off, creating a bifurcation or branching phenomenon that allows a system to go in an entirely new direction (Abraham *et al.*, 1990). Knowing this, Egyptian managers become even more skilled at helping systems to bifurcate into new and creative possibilities.

8. Limitations and future research

This study was conducted in Egypt so some caution should be exercised in generalizing its results to other Arab countries. However, Muna (1980) suggests that Arab societies (moderate and traditional) have an inner similarity and share certain values despite the obvious differences in economic and political attainment of their members.

Culture is an extremely complex phenomenon, and only further empirical work can help isolate the specific cultural variables, including those having to do with religiosity, that are most pertinent to creativity in business organisations in various areas of the world.

The present results suggest that the need for validation of the KEYS and BTC instruments should continue to be investigated as the creativity perceptions in Egyptian society change over time. Several different forms of validity can serve as criteria for assessing the psychometric soundness o scale (Grapentine, 1995). In this research we performed only one form: convergent-validity analysis. This from of validity pertains to the extent to which scale items assumed to represent a construct do in fact "converge" on the same construct. Future researchers using KEYS and BTC instruments may test the scales discriminate validity or predictive/concurrent validity. Discriminate-validity analysis shows the extent to which a scale is new and not just a reflex of other variables. The predictive or concurrent facet of validity refers to the extent to which scale scores are associated as hypothesized with other conceptually related measures.

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Appendix 1. KEYS instrument

(1) I have the freedom to decide how I am going to carry out my projects.
(2) I feel that I am working on important projects.
(3) I have too much to do in too little time.
(4) This organisation is strictly controlled by upper management.
(5) My area of this organisation is innovative.
(6) My co-workers and I make a good team.
(7) The tasks in my work are challenging.
(8) In this organisation, there is a lively and active flow of ideas.
(9) My supervisor clearly sets overall goals for me.
(10) There is much emphasis in this organisation on doing things the way we have always done them.
(11) I have sufficient time to do my project(s).
(12) I feel considerable pressure to meet someone else's specifications in how I do my work.
(13) Overall, this organisation is effective.
(14) Overall, the people in this organisation have a shared "vision" of where we are going and what we are trying to do.
(15) There is a feeling of trust among the people I work with most closely.
(16) People in this organisation are very concerned about protecting their territory.
(17) There are too may distractions from project work in this organisation.
(18) New ideas are encouraged in this organisation.
(19) Within my work group, we challenge one another's ideas in a constructive way.
(20) There is destructive competition within this organisation.
(21) My supervisor has poor interpersonal skills.
(22) Performance evaluation in this organisation is fair.
(23) I do not have the freedom to decide what project(s) I am going to do.
(24) People in my work group are open to new ideas.
(25) The facilities I need for my work are readily available to me.
(26) My supervisor serves as a good work model.
(27) In this organisation, top management expects that people will do creative work.
(28) In my work group, people are willing to help one another.
(29) Procedures and structures are too formal in this organisation.
(30) There are unrealistic expectations for what people can achieve in this organisation.
(31) Generally, I can get the resources I need for my work.
(32) My supervisor's expectations for my project(s) are unclear.
(33) People are quite concerned about negative criticism of their work in this organisation.

(34) People are recognized for creative work in this organisation.
(35) The tasks in my work bring out the best in me.
(36) My supervisor plans poorly.
(37) The organisation has an urgent need for successful completion of the work I am now doing.
(38) People in this organisation feel pressure to produce anything acceptable, even if quality is lacking.
(39) There is an open atmosphere in this organisation.
(40) There is a good blend of skills in my work group.
(41) Ideas are judged fairly in this organisation.
(42) Top management does not want to take risks in this organisation.
(43) In my daily work environment, I feel a sense of control over my own work and my own ideas.
(44) Failure is acceptable in this organisation, if the effort on the project was good.
(45) The budget for my project(s) is generally adequate.
(46) My area of this organisation is creative.
(47) My area of this organisation is productive.
(48) People are encouraged to solve problems creatively in this organisation.
(49) People are rewarded for creative work in this organisation.
(50) My supervisor supports my work group within the organisation.
(51) Overall, my current wok environment is conducive to my own creativity.
(52) I feel challenged by the work I am currently doing.
(53) My area of this organisation is effective.
(54) A great deal of creativity is called for in my daily work.
(55) People in this organisation can express unusual ideas without fear of being called stupid.
(56) I can get all the data I need to carry out my project(s) successfully.
(57) The people in my work group are committed to our work.
(58) My supervisor does not communicate well with our work group.
(59) I get constructive feedback about my work.
(60) This organisation has a good mechanism for encouraging and developing creative ideas.
(61) People are encouraged to take risks in this organisation.
(62) I have trouble getting the materials I need to do my work.
(63) I feel that top management is enthusiastic about my project(s).
(64) Overall, this organisation is productive.
(65) People are too critical of new ideas in this organisation.
(66) There is free and open communication within my work group.
(67) My supervisor shows confidence in our work group.
(68) Overall, my current work environment is conducive to the creativity of my work group.
(69) I feel a sense of time pressure in my work.
(70) Overall, this organisation is efficient.
(71) My supervisor values individual contributions to projects.
(72) My supervisor is open to new idea.

(73) My area of this organisation is efficient.
(74) The information I need for my work is easily obtainable.
(75) I believe that I am currently very creative in my work.
(76) Other areas of the organisation hinder my project(s).
(77) Destructive criticism is a problem in this organisation.

Appendix 2. BTC instrument

Attributes

(1) Not feeling involved.
(2) Low morale.
(3) Lack of communication.
(4) Conflicting goals and objectives.
(5) Lack of peer cohesion and support.
(6) No recognition and appreciation of work done.
(7) Risk aversion.
(8) Fear of failure.
(9) Threatening evaluation.
(10) Destructive criticism.
(11) Status quo.
(12) Management turn-down of suggestion.
(13) Not supported by the management.
(14) Time pressure.
(15) Work pressure.
(16) Rules and regulations to follow.
(17) Conservative management style.