Creative Self–Efficacy as the Mediator between Climate for Creativity and Creativity: Empirical Evidence from R&D of IT Sector of Pakistan

Sajeela Rabbani
PhD Scholar
Muhammad Sarmad
Assistant Professor
Riphah International University Rawalpindi, Pakistan

Abstract
This study aimed at exploring the role of creative self-efficacy between climate for creativity dimensions and creativity among R&D employees of IT industry of Pakistan. Data were collected from R&D related boss-subordinate dyads from major IT firms. Creative self-efficacy serves the role of bridge between climate for creativity dimensions like freedom, challenging work, sufficient resources, encouragement, workload pressures and organizational impediments and creativity of the employees. Analysis, like correlation, multiple regression and mediation have been done by using SPSS 22 to estimate these relationships. Findings revealed positive role of organizational, workgroup and supervisory encouragement and freedom in individual creativity. Organizational impediments and work load pressures play negative role in determining individual creativity. Further more creative self-efficacy has proved to be a mediator between climate dimensions and individual creativity. These results have practical and theoretical implications for both academicians and managers who are interested in high creativity of R&D employees.

Keywords: Creativity, Information Technology sector, Self-Efficacy, Pakistan

In today's turbulent business environment, organizations need to be more adaptive, creative, novel and entrepreneurial to meet the recent demands of the business world. Creativity is one of the major features that bring these attributes in organizations. Innovation is the successor of creativity and is the primary way to differentiate products from those of competitors(Wong, Peko, Sundaram, & Piramuthu, 2016). Employee's creativity is a valuable resource of an organization (Runco, Paek & Jaegar, 2015). Scholars of creativity research like Amabile, Conti, Coon, Lazenby, and Herron (1996), Runco, Paek and Jaeger (2015) and Woodman, Sawyer and Griffin (1993) believed that creativity is major constituent of all innovation either products or services. Hence it becomes a vital aspect of any business entity. In such scenario, organizations have learned that without creative human capital, business success cannot be anticipated. This situation requires employees to turn into creative individuals. Now employees are expected to produce innovative ideas to benefit organizations in economic terms and make creativity a crucial factor. Scholars have always considered creativity a desirable outcome and remained curios about those aspects which affect it (Girdauskienė, Asakalas & Savanevičienė, 2012).

Individual's own features like personality traits, knowledge, intelligence (Batey,Furnham & Safiullina,2010) ,motivation (Amabile, 1983a; Stein, 1993)and self-efficacy (Chong & Ma, 2010:Jaiswal & Dhar, 2016; Wang et al., 2014)are important. On the other hand, organizational aspects like leadership, skills and resources, organizational system, structure, supervisory support, organizational culture and climate (Sarros et al., 2011;Amabile et al. 1996) and physical working conditions (Dul et al., 2011) also influence creativity of an individual. Consequently, climate or work environment becomes a vital antecedent of creativity (Svedahl et al., 2016). It is a potential determinant of creativity (Horng, Tsai &Liu, 2014).

By interaction of individual with this social background(climate) creativity as a product is obtained (Perry-Smith & Mannucci, 2017). These organizational climates are studied as a whole (Djukic, Kovner, Brewer, Fatehi, & Cline, 2013) and by multidimensionality in nature and include various interpretations by the individuals working in it (Hsu and Fan, 2010; Neal, Griffin & Hart, 2000). These may contain encouraging and discouraging antecedents for creativity. Scholars have shown deep interest in the development of measuring instruments and models of work environment or climate for creativity. Amabile et al. (1996) through an ample model "KEYS: Assessing the Climate for Creativity" identified stimulants and inhibitors of creativity in work environment (Tseng & Liu, 2011). KEYS contain a broad set of organizational aspects which either contribute or hinder creativity and render it as a comprehensive and convincing model.

Work environments act upon creativity through internal psychological mechanisms of individuals. These mechanisms most frequently are intrinsic motivation (Amabile, 1983a; Zhu,Gardner & Chen, 2016) and related states like psychological empowerment (Spreitzer, 1995) and can be self-efficacy (Bandura, 1997; Bandura 2007).Among these self-efficacy has recently gained focus in management research. Tierney and Farmer (2002) modified this concept of self-efficacy to creative self-efficacy (CSE). It is identified as a significant determinant of creativity and creative performance (Jaiswal & Dhar, 2016).Both CSE and creative behaviour has reciprocal relationship and CSE has a significant role in creativity (Lemons, 2010; Wang et al., 2014).

This study has focused on psychological mechanism within an individual that leads to creativity and that is creative self-efficacy. It has not been previously investigated with respect to climate for creativity in IT sector and specifically R&D. Secondly, role of CSE in between climate and creativity is also first time investigated through this study in developing country like Pakistan. It focuses on individual creativity as a criterion of climate for creativity through creative self-efficacy. This is because research is inadequate in explaining the nature of creativity and climate dynamics in R&D of IT. Scholars have suggested the worth to study creativity and precursors in a single sector study (Isaksen & Akkermans, 2011) since outcomes of work environment on creativity in different industries are different (Nybakk, Crespell &Hansen, 2011) so research and development (R&D) in Information Technology (IT) industry of Pakistan and creativity determination by a valid model is yet to be explored. Conceptual replications of KEYS to various cultures and novel determinants of CSE are also urged to be researched (Jaiswal & Dhar, 2016; Mathisen, 2011). As far as IT industry is concerned it has recently shown fast growth and still expanding in Pakistan. Pakistani being a novel context, a distinguished set of features of organizational climate prevails. It was interesting to find out how well KEYS addresses the dynamics of creativity and climate in such organizations

Literature Review

Climate for Creativity and Creativity

Creativity is essentially an artefact of individual minds but work environment in which individuals carry out creative task is also crucial for it (Amabile et al. 1996). Interactive influence of individual and the context is a prevalent perspective of creativity and creative behaviour after individual and contextual influence (Kim & Lee, 2011). Creative work can be done in a good social environment (Svedahl et al., 2015).Organizational work environment is found to be a major determinant of creativity (Amabile et al. 1996; Dul et al., 2011) and it is also termed as climate for creativity. Climate is referred as a recurring pattern of human behaviour that determines a life in the corporation (Isaken, Lauer, Ekvall & Britz, 2001).Climates which are encouraging for creativity foster creativity (Hsu and Fan, 2010). These environments are multidimensional in nature and include various interpretations by the individuals working in it (Neal, Griffin & Hart, 2000).

Coveney (2008) argued that perceptions regarding work environment leads to creativity and productivity. These climates are perceived by organizational members and scholars identified many of their features individually and collectively affecting creativity (Djukic et al., 2013). Considering the dominant importance of work environment, researches put forward several explanations of work climate or working environment. Examples are KEYS (Amabile et al., 1996) and affect climate (Parke & Seo, 2017). KEYS being well comprehensive model include various aspects of organizational climate for creativity. These include 1) *Encouragement of Creativity* (organizational encouragement, supervisory encouragement, and Work group support), 2) *Freedom/Autonomy* (independence given to perform according employee's own will), 3) sufficient resources (perceived availability of resources), 4) *Pressures* (workloads and time) and 5) *Organizational Impediments to Creativity* (hindrances towards creativity). Based upon the above discussion it has be enlightened that organizational and supervisory encouragement, work group support, freedom, sufficient resources and challenging work influence creativity positively whereas work load pressures and organizational impediments serve as hindrances to the creativity. On the basis of these conceptualizations the following hypotheses have been drawn for this study in which similar results are expected.

H1: Organizational encouragement is positively related with creativity.
H2: Supervisory encouragement is positively related with creativity.
H3: Work group support is positively related with creativity.
H4: Freedom is positively related with creativity.
H5: Sufficient resources are positively related with creativity.
H6: Challenging work is positively related with creativity.

H7: Work load pressure is negatively related with creativity.
H8: Organizational impediments are negatively related with creativity.

Creative Self-Efficacy and Creativity

There are many antecedents of creative performance including individual attributes, contextual factors, thinking and psychosocial environment (Chong & Ma, 2010: Mathisen & Bronnick, 2009). One of these personal attribute is creative self- efficacy (CSE). Researches on creativity and motivation lead towards the concept of creative self-efficacy (Tierney &Farmer, 2002). It is a belief of self-capacity of knowledge, skills and abilities to carry out a job .It is internal feeling of motivation that determines an individual's particular behaviour (Bandura, 1997; Bandura, 2007). It works like intrinsic motivation and provide positive feeling to carry out a specific task in a specific way (Alotaibi, 2016). It is sort of confidence in one's self that is gained from within and from social context (Tierney & Farmer, 2011). Creative self-efficacy significantly determines creative performance (Jaiswal & Dhar, 2016; Tierney &Farmer, 2002). CSE and creative behaviour affects each other significantly (Lemons, 2010; Wang et al., 2014). Among other individual and contextual antecedents of creativity and creative performance, CSE is an important one (Chong & Ma, 2010: Mathisen & Bronnick, 2009).

H9: Creative Self-efficacy is positively related to Creativity.

Climate for Creativity and Creative Self efficacy

Creative self-efficacy of an employee itself is an output of several influencing factors. Slatten (2014) classified antecedents of CSE into three as related to job, leadership (Jaiswal & Dhar, 2016) and self. Job tenure, supervisory behaviour and work complexity serves as major antecedents of CSE (Tierney & Farmer, 2002). Contextual antecedents also include autonomy, learning orientation, organizational affiliation (Mathisen & Bronnick, 2009), creative role identity and creative expectations by the boss also determines high levels of creative self-efficacy (Tierney & Farmer, 2010).

Freedom or autonomy at work is a lot of valuable in increasing one's CSE, because it makes an individual intellectually stable, flexible and confident to do what he likes. Similarly support from boss and organization also enables an employee to have capacity for tasks to do. Therefore job autonomy, freedom and support are important antecedents of CSE (Mathisen, 2011). A detailed model inclusive of many organizational antecedents is inevitable to predict Creative Self-efficacy (Chong & Ma, 2010). So it becomes interesting to figure out impact of climate for creativity on creative self efficacy as a psychological process within an individual towards being creative. High creative self-efficacy leads to creativity as a prerequisite (Diliello et al., 2011) and CSE tends to increase one's creativity (Wang et al., 2014). Thus the following hypotheses have been drawn

H10: Creative Self-efficacy mediates between organizational encouragement and creativity.
H11: Creative Self-efficacy mediates between supervisory encouragement and creativity.
H12: Creative Self-efficacy mediates between work group support and creativity.
H13 Creative Self-efficacy mediates between freedom and creativity.
H14: Creative Self-efficacy mediates between sufficient resources and creativity.
H15: Creative Self-efficacy mediates between challenging work and creativity.
H16: Creative Self-efficacy mediates between work load pressure and creativity.
H17: Creative Self-efficacy mediates between organizational impediments and creativity.

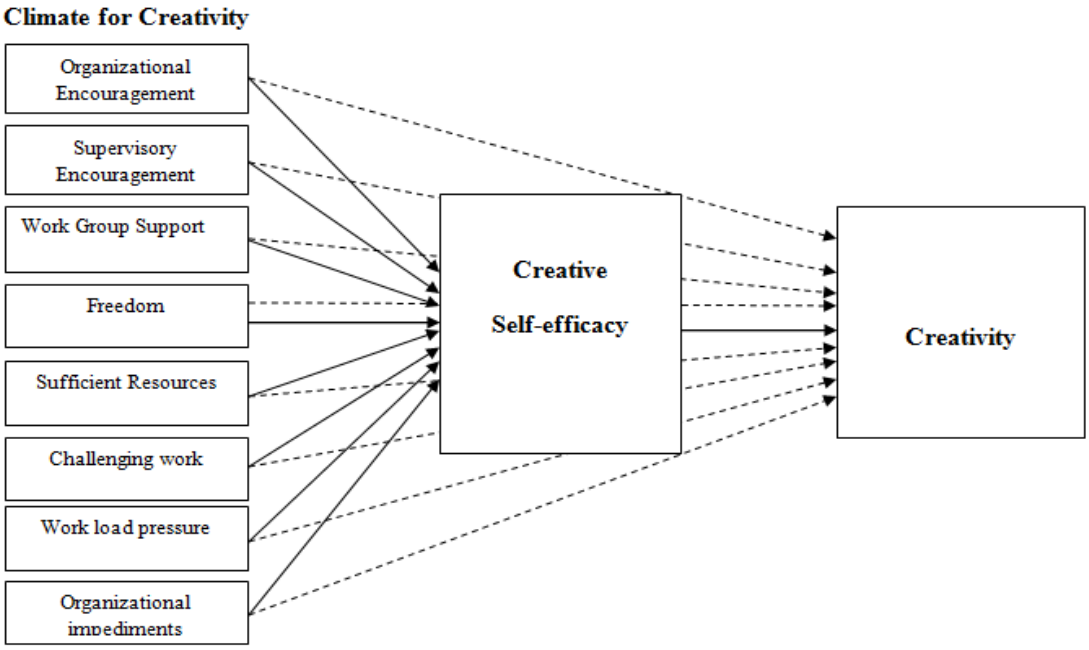

Figure 1. Research Model

Methodology

Sample and data collection

This empirical study conducted on Boss-Employee dyads of R&D of IT industry in twin cities, Peshawar, Lahore and Karachi of Pakistan. Managers of the respective departments were contacted and briefed about the study. A total of 280 surveys were distributed out of which 123 surveys found complete in all aspects. Response rate was 44% and surveys finally included in the study. Dyads of Boss-Subordinate are used to measure responses without behavioural biases through time lag study such as done by Carmeli (2010).

During time 1 survey related to demographics, climate for creativity and creative self-efficacy were used. In time 2 after a gap of 1 month survey related to employee creativity were completed. To ensure the same respondent during time 1 and time 2, first letter of name(s) of employees have been used as codes of recognition. Among respondents 84% were males and 16% were females. Age of 59 % respondents was between 21-30, 34% was 31-40 and 7% 41-50 years. 66% of the experience was about 66% between 1-5, 20% was 6-10, 11% was 11-15 and 3% was 16 year and above. Furthermore, 11% had M.phil & above degree, 26 % had Master's degree, 49 %had bachelor degree the rest of 13% had intermediate.

Survey instruments

All the variables were assessed on a five-point Likert-type scale from 1 ('strongly disagree') to 5 ('strongly agree'). Overview of the survey instruments is as under:

Climate for Creativity (KEYS). Climate for creativity is measured with scale originally developed by (Amabile et al., 1996) naming KEYS: Assessing the Climate for Creativity scale. It is a well tested scale to measure perceptions about climate for creativity(Mathisen & Einarsen, 2004). 32 items of this scale have been used as revised by Verbeke et al.(2013) in this study. All items were measured on a five-point likert type scale ranging from *1= strongly Disagree* to 5=*strongly Agree.* Sample item was "New ideas are encouraged in this organization".

Creativity. Creativity was measured with individual creativity scale introduced by (Zhou & George, 2001). It consisted of thirteen items. All items were measured on a five-point liker type scale ranging from *1= strongly Disagree* to 5=*strongly Agree.* Sample item included *"*He suggests new ways to achieve goals or objective*".*

Creative Self-Efficacy. Creative Self-Efficacy was measured by 3 items developed by (Tierney & Farmer, 2002). This scale measured employees' belief in their ability to be creative at work and has been used in studies like Chong and Ma (2010). Sample item was "I have confidence in my ability to solve problems creatively."All items were rated using a 5-point scale ranging from *1= strongly Disagree to 5=strongly Agree.*

Analysis

Analysis was done using SPSS 22, in order to explore the relationships among the variables. The results showed a good model fit. The following table 1 shows correlations among variables.

Table 1: *Correlation Analysis*

	1	2	3	4	5	6	7	8	9	10
1. OrgEnc	(.86)									
2.SupEnc	.377**	(.67)								
3.WGsupt	.616**	.408**	(.73)							
4.Suff Res	.656**	.322**	.630**	(.83)						
5.Chl Wk	.195*	-.021	.211*	.269**	(0.62)					
6.Freedm	.262**	.279**	.115	.229*	.066	(.64)				
7.OImp	-.323**	-.380**	-.176	-.202*	-.168	-.026	(.75)			
8.WLPr	-.300**	-.479**	-.044	-.197*	-.144	-.175	.637**	(.80)		
9.CSE	.556**	.265**	.446**	.413**	.228*	.287**	-.141	-.228*	(.77)	
10.Crtvty	.500**	.249**	.411**	.421**	.117	.322**	-.122	-.211*	.540**	(.89)

*P<0.05, ** P <0.01, values in parenthesis shows alpha reliabilities of the scales.
OrgEnc=Organizational Encouragement, SupEnc=Supervisory Encouragement, W.G.s=work group support, SuffRes=Sufficient Resources, ChlWk=Challenging work, Freedm=Freedom, OImp=Organizational impediments, LWL pr=Low work load pressure, CSE=Creative self efficacy, Crtvty=Creativity

Table 1 shows correlation analysis and alpha reliabilities of the scales. All variables show acceptable range of alpha reliability. Correlation shows direction of the relationships among variables. It shows that organizational encouragement, supervisory encouragement, workgroup support, sufficient resources, & freedom are positively associated to creativity as 0.500**, 0.249**, 0.411**, 0.421** & 0.322** and creative self-efficacy with values 0.556**, 0.265**, 0.446**, 0.413** & 0.287**. Challenging work is found to be positively related with CSE (0.228*) but remained insignificant for Creativity (0.117 ns).On the other hand workload pressures are negatively related to creativity (-0.211**) and creative self-efficacy as -0.228*, while organizational impediments found to be negatively yet insignificantly related to creativity (-0.141) and creative self-efficacy (-0.122). Creative self-efficacy is also positively associated with creativity as 0.540**.

Table 2: *Multiple Regression Analysis for predictors of creativity*

Predictors	Creativity		
	B	**R^2**	**ΔR^2**
Step 1: *Control Variables*		.055	
Step 2: Organizational Encouragement	.217*		
Supervisory encouragement.	.139*		
Work Group Support	.170*		
Freedom	.143*		
Sufficient Resources	.224		
Challenging work.	.015		
Work Load Pressures	-.122*		
Organizational impediments	-.087	.388	.321**

** p<.05, ** p<.01, *** p<.001*

Regression results revealed that organizational encouragement, supervisory encouragement, work group support and freedom as found to be positively associated with creativity as .217, P< 0.05; .139,P<.05; .170,P<.05; .143,P<.05. Sufficient resources, and challenging work found to have no effect on creativity as .224,*ns* and .015,*ns*. On the other hand organizational impediments have also found with

no effect on creativity as -.087,*ns* but workload pressure affects creativity negatively as -.122, P<.05. This proved that hypotheses H1, H2, H3 and H4 have been accepted. H5 and H6 have been rejected. On the other hand work load pressures have been found negatively affecting creativity as -.122, P<.05 and H7 has been supported and accepted. However hypothesis 8 was rejected due to insignificant relationship of organizational impediments and creativity. The effect of demographic variables like qualification, age, gender and experience is controlled.

Table 3: *Regression Analysis for influence of Creative-Self efficacy on Creativity*

Predictors	Creativity			
	B	S.E	T	P value
Creative Self-efficacy	.357	.050	7.082	000

Hypothesis 9 anticipated positive impact of CSE on creativity and it has been supported through regression analysis as β=.357, P<.001 and it is accepted because CSE has positive impact on creativity.

Table 4: *Mediation effect of creative self-efficacy between organizational encouragement and creativity*

	B	**SE**	**t**	**P**
Organizational Encouragement → Creativity	.3307	.0518	6.3827	.0000
Organizational Encouragement → Creative Self- efficacy	.5549	.0751	7.3879	.0000
Creative Self- efficacy → Creativity	.2508	.0584	4.2919	.0000
Organizational Encouragement → Creative Self- efficacy → Creativity	.1916	.0583	3.2853	.0013
Bootstrap results for indirect effect	Indirect effect .1391	LL 95% CI .0607	UL 95% CI .2315	

Notes: Un-standardized regression coefficients reported. Bootstrap sample size 1000. LL=Lower Limit; CI= Confidence Interval, UL=Upper Limit

Table 4 explains, first step that shows significant positive relation of organizational encouragement and creativity, β= 0.33, P<.001. Second step includes effects of Org Enc on CSE which also rendered significant and positive, β= 0.5549, P<.001 and CSE to creativity as β= 0.2508, P<.001.Beta weight reduced but remained significant shows mediation of CSE between Org Enc and creativity (0.3307 to 0.1916, P<0.05. Thus hypothesis H10 is accepted

Table 5: *Mediation effect of creative self-efficacy between supervisory encouragement and creativity*

	B	**SE**	**T**	**P**
Supervisory Encouragement → Creativity	.1719	.0606	2.8357	.0054
Supervisory Encouragement → Creative Self- efficacy	.2760	.0911	3.0285	.0030
Creative Self- efficacy → Creativity	.3375	.0521	6.4779	.0000
Supervisory Encouragement → Creative Self- efficacy → Creativity	.3375	.0521	6.4779	.0000
Bootstrap results for indirect effect	Indirect effect .0932	LL 95% CI .0228	UL 95% CI .2055	

The effect of supervisory encouragement on creativity and CSE was found positive, β=.1719, P<0.05 and β=.2760, P<0.05.Beta weights increased so there is no mediation and hypothesis H11 has been rejected.

Table 7: *Mediation effect of creative self-efficacy between work group support and creativity*

	B	SE	T	P
work group support → Creativity	.2936	.0590	4.9790	.0000
work group support → Creative Self-efficacy	.4811	.0874	5.5040	.0000
Creative Self- efficacy → Creativity	.2947	.0552	5.3425	.0000
work group support → Creative Self-efficacy → Creativity	.1518	.0595	2.5511	.0120
Bootstrap results for indirect effect	Indirect effect	LL 95% CI	UL 95% CI	
	.1418	.0631	.2630	

The effect of work group support on creativity and CSE was found positive, β=.2936, P<0.001 and β=.4811, P<0.001.Beta weights reduced and remained significant so there is mediation and hypothesis 12 has been accepted.

Table 8: *Mediation effect of creative self-efficacy between Freedom and creativity*

	B	**SE**	**t**	**P**
Freedom → Creativity	.2158	.0577	3.7380	.0003
Freedom → Creative Self- efficacy	.2908	.0884	3.2901	.0013
Creative Self- efficacy → Creativity	.3244	.0518	6.2677	.0000
Freedom → Creative Self- efficacy → Creativity	.1215	.0525	2.3129	.0224
Bootstrap results for indirect effect	Indirect effect	LL 95% CI	UL 95% CI	
	.0943	.0324	.1976	

The effect of Freedom on creativity and CSE was found positive, β=.2158, P<0.05 and β=.2908, P<0.05.Beta weights reduced and remained significant so there is mediation and hypothesis 13 has been accepted

Table 9: *Mediation effect of creative self-efficacy between sufficient resources and creativity*

	B	**SE**	**t**	**P**
Sufficient resources → Creativity	.224	.0437	5.1229	.1321
Sufficient resources → Creative Self-efficacy	.3325	.0662	5.0206	.0000
Creative Self- efficacy → Creativity	.2922	.0538	5.4317	.0000
Sufficient resources → Creative Self-efficacy → Creativity	.1267	.0432	2.9323	.1420
Bootstrap results for indirect effect	Indirect effect	LL 95% CI	UL 95% CI	
	.0971	.0439	.1773	

The effect of sufficient resources on creativity was already insignificant through regression. This led to mediation in vain as direct effect doesn't exist So hypothesis 14 has been rejected.

Table 10: *Mediation effect of creative self-efficacy between challenging work and creativity*

	B	SE	t	P
Challenging work → Creativity	.0330	.0254	1.2982	.1967
Challenging work → Creative Self- efficacy	.0975	.0377	2.5860	.0109
Creative Self- efficacy → Creativity	.3598	.0521	6.9117	.0000
Challenging work → Creative Self- efficacy → Creativity	-.0021	.0222	.0937	.9255
Bootstrap results for indirect effect	Indirect effect	LL 95% CI	UL 95% CI	
	.0351	.0095	.1920	

The effect of challenging work on creativity was found insignificant, β=.0330, ns. Hypothesis 15 has been rejected due to missing of direct affect.

Table 11: *Mediation effect of creative self-efficacy between workload pressures and creativity*

	B	SE	t	P
Workload pressures → Creativity	-.1303	.0549	-2.3722	.0193
Workload pressures → Creative Self- efficacy	-.2121	.0828	2.5618	.0116
Creative Self- efficacy → Creativity	.3448	.0517	6.6653	.0000
Workload pressures → Creative Self- efficacy → Creativity	-.0572	.0484	-1.1814	.2398
Bootstrap results for indirect effect	Indirect effect	LL 95% CI	UL 95% CI	
	-.0731	-.1606	-.0161	

The effect of workload pressures on creativity was found significant and negative, β= -.1303, P<0.05 and with CSE β=-.2121, P<0.05. Beta weights reduced and no more significant so there is mediation and hypothesis 16 has been accepted.

Table 12: *Mediation effect of creative self-efficacy between organizational impediments and creativity*

	B	SE	t	P
Organizational impediments → Creativity	-.0706	.0526	-1.3441	.1815
Organizational impediments → Creative Self- efficacy	-.1269	.0793	-1.6008	.1120
Creative Self- efficacy → Creativity	.3590	.0511	7.0272	.0000
Organizational impediments → Creative Self- efficacy → Creativity	-.0251	.0448	-.5593	.5770
Bootstrap results for indirect effect	Indirect effect	LL 95% CI	UL 95% CI	
	-.0456	-.1401	.0071	

The impact of organizational impediments on creativity was found insignificant .Hence mediation effect is also not there and hypothesis 17 has been rejected.

Results and Discussion

The result of H1 shows that encouragement of creativity is positively associated with individual's creativity. As the organization, workgroup and supervisor supports and encourage novel ideas, therefore employees feel energised to bring out creative outputs. Organizational encouragement inspires employees to admit risk and failure during process of creation. On the other hand supervisor's support provides explicit goals and allows oneself to contribute individually to the main outcome through motivation. Similarly, peers of the group also exercise trust and criticism among selves. They

carry together initiatives and assist each other to make the idea brilliant and more creative (Verbeke , Franses , Blanc & Ruiten,2008). These dynamics render H2 and H3 accepted in this study. These results are consistent with outcomes of Band (2014) study of climate and organizational creativity.

The freedom to carry out tasks in some one's own way gives him/her confidence and ownership to perform his/her own way (Amabile et al, 1996). Hence the internal drive to perform something creative is initiated and extends creativity. Since autonomy, gives poise to conduct a task in person's own way, thus free hand to carry out creative work assures high levels of creativity. Same results have been realized in study of Band (2014) for freedom and creativity.

H5: Sufficient resources are positively related with creativity.

H6: Challenging work is positively related with creativity.

Sufficiency of organizational resources affects almost all areas of it. Resources equip an individual with necessary material inputs to work in a comforted manner. The perception of sufficiency of the resources should be instrumental in enhancing individual creativity but the results have shown other way. Hypotheses 5 have been rejected during this study. This may because perceived availability and allocation of resources psychologically drives individuals towards belief of task significance for organization (Amabile et al, 1996). Conversely, conservation of resource theory (Hobfall, 1989) explains that people urge to conserve resources and avoid resource loss stronger than their gains. Thus in this context, despite plenty of resources people may remain ineffective for creativity and don't remain concerned for sufficiency of resources. Therefore, H5 has been rejected through this study.

Like sufficient resources, relationship of challenging work and creativity has also been proved insignificant. Expectancy theory (Vroom, 1964) explains such phenomenon where there is effort and reward association. People perceive the outcome of their efforts sufficient to fulfil their needs. So challenging work doesn't work in play in this scenario because people don't work for challenges rather for benefits they shall receive in doing so. So hypothesis 6 has been rejected in this study.

H7: Work load pressures are negatively related with creativity.

H8: Organizational impediments are negatively related with creativity.

Work load pressures have been tested as one of main impeding factors of creativity through hypotheses. Organizational pressures and workload pressures creates discomfort in the individual thoughts. They irritate the focus of the individual on a particular creative task and hinder attention to detail. Research on pressure and creativity provided us with two outputs in terms of pressures. Sometimes these are unrealistic workloads and on the other side these are said to be a challenge. If these are like challenges and of the demand of the project then they raise creativity and otherwise decrease creativity. However as a general case in our data set the R&D employees are under high pressure of time and control. Therefore H7 is accepted in this study.

Other similar organizational attributes such as rigidity, power positions, politics, dissensions, formality in structure (Cook, 1998) and adherence to old traditions hamper creativity of the members. This is because individuals seek openness and freedom to conduct task in their own way and these mentioned aspects are perceived as controlling. These affect intrinsic motivations of the individuals (Deci & Ryan, 1985) such that these undermine willingness and called organizational impediments. In this study, organizational impediments have proved to be insignificant with creativity. Hence our hypothesis 8 has been rejected.

The impact of creative self-efficacy becomes inherent bridge between several external and internal factors of an individual towards creativity. Creativity is described as the outcome of intrinsic motivation of a person towards creative task that is something from within. Similarly creative self-efficacy is also internal inclination and intention sort of feeing that determines one's creative behaviour (Jaiswal & Dhar, 2006). It acts as an internal driving force and potential to carry out creative outcomes. It also intellectually stabilize, make flexible and confident oneself to do what s/he likes (Mathisen & Bronnick, 2009).

Mediation of creative self-efficacy has proved to be true through this study between climate for creativity and creativity as hypotheses 10 to 13 is concerned. Results have been in line with study of Chong and Ma (2010) Encouragement and freedom of all natures in organization leads towards creative self efficacy because these make an individual psychologically flexible in thinking, stable and convinced as depicted in studies of Mathisen(2011), Tierney & Farmer (2010) and Tierney & Farmer (2011).

H14 and H15 of challenging work and sufficient resources have been rejected because of absence of direct effects of sufficient resources and creativity and challenging work and creativity during regression phase.

Organizational work load pressures impact creativity adversely and through creative self-efficacy. This becomes so because workload pressures propose physical and psychological burdens which in turn diminish self control and confidence of the individuals. Therefore hypothesis 16 has been accepted.

Organizational hindrances or impediments hinder, block or undermine creativity (Cook, 1998). These have proven to be non detrimental for creativity as compared to hypothesized. This happened due to missing direct effects and thus no mediation of organizational impediments and creativity. Hypothesis 17 has been rejected in this study.

Conclusion

The research extended and examined theoretical underpinning of how work environment influences creativity of the employees in R&D of IT directly and indirectly through creative self-efficacy of the employees. The results have significant implications for both academia and practitioners. First, the results proved that climate for creativity plays a significant role in determining creativity of the employees. Several facets of the climate for creativity, more or less, influence employee's creativity levels. Direct and indirect effects of various dimensions of climate for creativity have been established on creativity through this study. Few have been fund reverse as expected. This is a matter of eye opening for policy makers and strategy developers of R&D of IT sector. It is also a point to ponder for academicians who works in field of creativity and climate dynamics.

Second, the results also demonstrated mediation of creative self-efficacy across various dimensions of climate for creativity and creativity. Hence the association between climate and creativity cannot merely be established as causal but also indirectly through mediators like creative self-efficacy and others. This describes that various previous studies have reported diverse results (Hsu and Fan, 2010; Isaken, Lauer, Ekvall & Britz, 2001; Kim & Lee, 2011; Svedahl et al., 2015) regarding creativity and the work environment.

Limitations and Future Research

This study has used dyadic sample to explain dynamics of creativity in IT R&D of Pakistan. Self report questionnaire was avoided to reduce social desirability bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) in terms of creativity. However there are few limitations of the study. First we have used a limited sample size to address the indicated relationships. Future studies may use diverse sample to explain effects of climate for creativity and creativity to increase generalizability of the study. Secondly, there may be various other mediating factors between climate for creativity and creativity than creative self-efficacy, which need to be included in future research efforts. Third, this tested model is applied to IT industry of Pakistan, so it can be used in other cultures to illuminate academia more about the matter. Last, the study focused on R&D employees of IT firms, future studies should consider other type of firms or departments like marketing, production to validate the findings.

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