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The Influence of Leadership Style on Employee Creativity: Focusing on the Mediating Effect of Self-Efficacy

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Abstract

Purpose – This study investigated the effects of leaders of national universities on faculty creativity. The study examined transformational leadership and creativity theories and investigated self-efficacy, the parameter between transformational leadership and creativity, to examine its moderating effect and provide policy implications for national universities.

Research design, data, and methodology – This study built four hypotheses based on the literature review, and tested these using a survey methodology. The collected data were analyzed using SPSS 15.0.

Result – At the national universities, the results were as follows: charisma of leaders had a positive influence on member creativity; intellectual stimulus of leaders had a positive influence on member creativity; and, individual consideration of leaders had a positive influence on member creativity. Therefore, leaders' transformational leadership had a positive influence on member creativity.

Conclusion – Creativity is thought to be important for organizational survival and continuous development at rapidly changing education administrations. Educational administration leaders should exercise transformational leadership to develop member creativity. Member self-efficacy, which had a mediating effect on creativity, requires leadership to develop it.

Keywords: Transformational Leadership, Self-Efficacy, Creativity.

JEL Classifications: M1, M12, L20.

1. Introduction

In knowledge based society, environment of the universities made change quickly. The competitiveness of the universities producing human resources and knowledge made competitiveness of future country to worry about low competitiveness of universities. This was because universities managed uniformly without differentiation to worry about changes. The education market in Korea has been opened owing to internationalization as well as opening of service market, and college age population was less than college entrance quota at low birthrate to require reformation of college organization. In the era of globalization and information, national universities in Korea have strengthened competitiveness of internal and external competitiveness to increase influence by knowledge, information, members' creativity and passion and other intangible asset. New leadership is needed to take effective action under uncertainty of college management environment, and effective leadership is needed to help attain organizational goal. Not only national universities but also private universities have made ways of strengthening of competitiveness to survive and develop. Seoul National University and others have promoted incorporation that has put emphasis upon autonomy and responsibility to be influenced by internal and external changes. National universities shall research new leadership of organization in the flow of times, and researches have not been made enough in Korea. Considering characteristics of universities, organizational members shall have creativity to develop organization to grow up. Forward-looking goal, reestablishment of the values and creative thought and behavior are needed. First of all, leaders' roles are important to let members have creative thought and behavior.

People have made effort to control cases having influence upon their lives together with leadership(Bandura, 1997). Having influence upon control area can realize better future to prevent undesirable future. Without belief in production of desirable result by behavior, people shall not take actions. Belief in efficacy may be source of behavior and people's lives rely upon the belief(Kim , Park, Yang , 1999). People make a kind of image on them to be self-concept. Self-efficacy is often used to test

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self-concept(Baek, 2003). Self-efficacy is said to be belief in oneself that an individual does under specific situation(Bandura,1982).

Self-efficacy is focused on cognition of specific matter.

This study empirically investigated effects of leaders of national universities upon faculty's creativity. The study examined theories of transformational leadership and creativity. The study investigated self-efficacy, parameter between transformational leadership and creativity to examine moderating effect upon transformational leadership and creativity and to give implications for effectiveness of national universities.

2. Literature review

2.1. Transformational leadership

2.1.1. Concept

Transformational leadership is said to raise members' passion and vision. (Bass, 1985). In the study on political leaders, transformational leadership has influence between individuals from microscopic point of view, and exercises power to innovate organizations and to make change of social system from macroscopic point of view(Burns,1978).

Since study of Burns in 1978, transformational leadership theory was made based on political leadership of Burns to make in accordance with organizational situation(Bass,1985). The theory said that other leadership theories were based on exchange between leaders and subordinates(Lee, 2004, re-quoted).

Transformational leadership indicates characteristics of leaders who revitalize organization to reform successfully(Kim, et al, 2012). The leadership has relations with members' performance to develop their potential as much as possible and to make change of members' quality(Bass & Avolio, 1990). Transformational leadership is said to be that not only high level ideal but also moral value may give members high ability and motives(Burns,1978). Top management and everyone regardless of ranking and department are able to take the lead in reformation of all of organizations(Burns,1978).

Transformational leadership can be played regardless of hierarchical system to differentiate from transactional leadership relying upon individuals' interest relations and to differ from bureaucratic authority system putting emphasis upon legitimate power, rules and tradition. And, transformational leaders give followers long-term vision and ask to devote in order to attain the vision(Jo, 2014, requoted). Transactional leadership produces effects from members, while transformational leadership creates unexpected effect(Bass, 1985). Transformational leadership consists of charisma, individual consideration and intellectual stimulus(Bass, 1985). The study investigated three factors of transformational leadership.

2.1.2. Transformational leadership factors

(1) Charisma

Charisma is said to overcome difficulties by professional leader and to reform and to give subordinates pride and belief(Bass & Avolio, 1990). In other words, charisma is said to be given high level of respect from subordinate and to have characteristics, ability and talent and to be cognized by surrounding persons. Charisma leader is said to be product of mutual reaction between leaders and subordinates. Charisma is an important factor of transformational leadership to accompany subordinates' pride, reliability and respect(Waldman & Bass,1987). In other words, a leader shall be able to understand important things to express business mission effectively and to give subordinates visions(Bass & Avolio, 1987). Charismatic leader makes effort to make change of current state of organization and to give subordinates idealistic goal and to attain organizational goal bearing risk and losses regardless of personal interests. The leader gives unprecedented ideas not adhering to rules and/or regulations to pursue innovative ideal and to express strong confidence.

(2) Individual consideration

Individual consideration is said to understand each member's desire when meeting and to express interests and to respect individually(Lee, Park and Adler, 2003). In other words, leader does not think of organizational members according to uniform standards and to respect of each one's emotion, interest and desire and to give subordinates motives and to give team members attention and to have consciousness of the changes and to give training for new skill development and to have confidence on the job. Individual consideration was thought to help improve subordinate's satisfaction and job efficiency at relation between leader and subordinates(Bass, 1985). The leader's behavior was found to be participating decision-making based on subordinates' desire on participation and/or growth. Leaders having individual consideration approached subordinates to meet unofficially, and treated subordinates equally even if having better ability than subordinates had. The leader's individual consideration behavior put an emphasis upon not only contact between leader and subordinates, but also bi-directional communication to establish self-image of subordinates and to elevate subordinate's desire of information and to have responsibility depending upon decision-making. Transformational leadership's charismatic factor made subordinates follow leader, while individual consideration helped subordinates grow up. So, leader who is charismatic to be short of consideration to subordinates may be given loyalty very much to rely upon him. The leader can be not transformational leader but charismatic leader(Bass & Avolio, 1988).

(3) Intellectual stimulus

A leader makes subordinates cognize problems by intellectual stimulus and watch problems from new point of view. Transformational leader makes think and solve problems by new

way. The leader's behavior helps subordinates overcome existing frame at analysis upon situation to develop creative viewpoints. The intellectual stimulus that has combined with emotional stimulus may increase consciousness to reform consciousness and to convert thought and have more influence. Leaders shall give new idea to let subordinates have challenge consciousness and to think of ordinary problems in new way (Bass, 1985). Leaders who give intellectual stimulus help subordinates think of current problems from point of view of future vision and to approach to problem solving from such a point of view. And, leaders help subordinates understand problems and to develop conceptualization and to think of natural matter again. Subordinates shall have doubt about existing values, beliefs and expectation to have speculation on improper and/or obsolete organizational value, belief and expectation. Therefore, leaders shall be intellectual to stimulate subordinate by using knowledge.

2.2. Self-efficacy

A lot of researches were done to find out variable that could make change of human behavior. The theory of self efficacy was thought to be the most important in the 21st century. Self-efficacy is said to be belief of doing well under specific situation (Bandura, 1982). Self-esteem can be generally cognized, and self-efficacy is focused on cognition on specific work. In precedent studies, the one with high self-esteem had good performance than the one with low self-esteem, and the one with high self-efficacy had good performance than the one with low self-efficacy (Miner, 1984). The one with high self-efficacy had larger learning effect, and accomplishment in the past had the greatest influence upon self-efficacy. Not only self-efficacy but also self-esteem is self-referent thought, and self-efficacy does behavior under specific situation (Haycock, 1998). Self-respect evaluates self-value, and self-efficacy does self-ability (Nam, 1998). Self efficacy deals with ambiguous and unexpected situation having plenty of tension to organize and perform (Schunk, 1995). Cognitive judgment of one's ability in the future is said to organize and put into practice of activities for accomplishment of goal (Kanfer, 1990, Park, 1999, requoted). Self-efficacy is said to be general belief on one's ability (Meyer and Gellathly, 1988). Self-efficacy is said to be efficiency, efficacy and confidence that one thinks he or she is eligible and able and efficient (Ahn, 1997). Self-efficacy includes individual's situation and behavior and cognitive judgment to let individual organize and perform special behavior under unexpected situation (Park, 1999).

2.3. Creativity

Many scientific areas actively researched creativity focused on individuals, groups and organizations. Creativity of organization is said to be new product, idea, procedure and process of individuals at complicated social system (Woodman, Sawyer, & Griffin, 1993). Definition of the creativity varies depending upon researchers (Mumford & Gustafson, 1988; Isaksen, Stein, Hilla &

Gryskiewics, 1983). Creativity is said to produce new and useful ideas and products by individual who does self-discovery (Amabile, 1983; 1988). Creativity is said to develop solution that is new and useful for job related matters (Shally, 1991). Creativity is defined to suggest new idea-making of either individual or group (Woodman, Sawyer, & Griffin, 1993). Idea of members in the organization is understood considering situation of the organization. Member having excellent creativity who is under rigid organization to do much standardized work is thought to be difficult to exercise creativity (Lee, 2004). Organizational members have two kinds of situation. The one is how much organizational situation accepts individual's creativity. The other is how much individual satisfies organization's demand on creativity. The former has relation with organization, and the latter does with member's creativity (Baek, 2002).

Therefore, creativity is said to be useful for organization and to suggest creative idea, product and/or procedure, and to work creatively on-the-spot.

In precedent studies, definition of the creativity varied depending upon researchers. In recent studies, variable of creativity is thought to be from point of view of result. Creativity was defined or measured from point of view of result, and social psychological approach having relation with work environment can be done (Amabile, 1983; 1988).

2.4. Precedent studies

2.4.1. Transformational Leadership and Creativity

Various kinds of variables may have influence upon members' creativity. Creativity suggests new idea and behavior to require other person's reliability. In particular, leaders can help members exercise creativity under environment producing new idea and behavior. Members do creative activity when leaders do consulting, support and give interests.

The first factor of charisma gives subordinates belief in better future to put emphasis upon subordinate's expectation related inherent factor to raise creativity. Leader's vision helps members cognize internal motivation to increase creativity and to raise group's creativity. The second factor of individual consideration does not judge members according to uniform standard to respect each one's emotion, interest and desire and to give subordinates motivation. Leader's investigation into each one's characteristics and difference and paying attention may be likely to have affirmative influence upon creativity. Third factor of intellectual stimulus allows subordinates to solve new problems and to give questions being free from obsolete way of thinking and to increase subordinate's creativity at intellectual stimulus behavior (Bass & Avolio, 1987). Transformational leadership may have affirmative influence upon subordinate's creativity (Bass & Avolio, 1990).

Leader's behavior for creativity includes charisma, individual consideration and intellectual stimulus to exercise transformational leadership, and leader's transformational leadership is likely to have affirmative influence upon members' creativity (Bass, 1985).

2.4.2. Transformational Leadership and Self-efficacy

Self-efficacy is thought to be belief, and leadership may be ideal variable to let members increase self-efficacy. Praise, stimulus and affirmative strengthening from leaders may give subordinates high and innovative values to be source of motivation. Members can be given motivation by spiritual compensation rather than physical compensation. Leader's admitting of subordinate's ability encouragement may help subordinate increase self-efficacy.

In the studies on relation between self-efficacy and leadership, self-efficacy was found to be useful to forecast changes of the behavior(Bandura & Wood, 1989; Lee & Lee, 1995; Shin & Baek, 2000). Self-efficacy is said to be individual's judgment on organizing and performing of human behavior under uncertain and unpredictable situation. In other words, self-efficacy has affirmative influence upon setting of performance standard, making effort, and efforts and will of overcoming of difficulties.

2.4.3. Self-efficacy and creativity

In precedent studies on self-efficacy, learners with high self-efficacy had good academic achievement than the one with low self-efficacy to have strong internal motive and to learn difficult and uninteresting subject with patience and to have good information processing strategy such as problem solving cognitive strategy and self-control(Bandura & Schunk, 1981). Self-efficacy's effects may have affirmative relation with creativity that has considerable influence upon not only academic achievement but also creativity. Selection of behavior may vary depending upon individual's self-efficacy, so that the one with low self-efficacy avoids challenging subject and the one with high self-efficacy selects challenging subject to work hard(Bandura, 1986). Self-efficacy has relations with creativity. The process of exercise of creativity requires plenty of efforts and time to have uncertain result of creative thought and to have creative idea being expelled from the society. Without strong self-efficacy, individuals are very much difficult to exercise creativity. Self-efficacy may have strong influence at exercise of the creativity(Bandura, 1997).

Transformational leadership, self-efficacy and creativity have significant relation. This study investigated mediating effect of self-efficacy with transformational leadership and creativity.

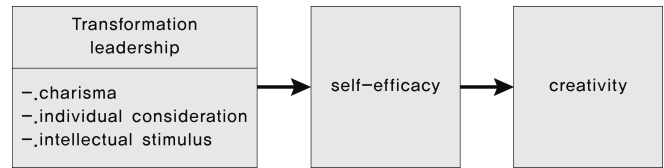
3. Methodologies

3.1. Models

Terminology of leadership has been often used at daily life. Leadership has plenty of definitions, and scholars and papers of organizational leadership are many in the area of organizational behavior.

This study investigated relation between transformational leadership and creativity that were factors of organization of national universities, and gave development way of the university.

Independent variables included charisma, individual consideration and intelligent stimulus, and dependent variables did creativity. Models were <Figure 1>.



<Figure 1> Hypothesis Model

3.2. Hypotheses

Transformational leadership is said to be exercise of the influence between individuals from microscopic point of view, and to be change of social system and mobilization of power for innovation of the organization(Burns,1978).

Transformational leaders should innovate followers' consciousness, values and attitude. Leadership theories were based on transactional exchange between leaders and subordinates not to promote thought and behavior for employees(Bass, 1985). Leadership is said to be process and technology that members can attain organizational goal by themselves. Leadership can be effective at relation between leaders and creativity. Effects may vary depending upon exercise of leadership. It may have different effects.

Transformational leadership makes subordinate have confidence on the job to stimulate subordinate's desire and to let subordinate make more effort and get outcome more than expected(Bass, 1985). Hypotheses were:

<Hypothesis 1> Leader's transformational leadership has positive influence upon members' creativity.

<Hypothesis 1-1> Leader's charisma has positive influence upon members' creativity.

<Hypothesis 1-2> Leader's individual consideration has positive influence upon members' creativity.

<Hypothesis 1-3> Leader's intellectual stimulus has positive influence upon members' creativity.

Men made effort to control cases having influence upon their lives(Bandura, 1997). Men made effort to have influence upon control areas to realize desirable future and to prevent undesirable future. The one who does not believe in production of desirable result by his behavior shall not take actions. Belief in the efficacy can be source of behavior, and men's lives rely upon efficacy(Kim, Park, 1999). Men form a kind of image on them that is self-concept. Self-esteem and self-efficacy are often used to test self-concept(Baek, 2003).

Self-efficacy has influence upon human functions such as cognitive process, motive process, emotional process and selective process that react each other on control of human behavior(Kim and Park, 1999). Hypothesis was:

<Hypothesis 2> Self-efficacy has mediating effect at the influence of transformational leadership upon members' creativity.

3.3. Material collection and methods

This study investigated effects of leader's transformational leadership upon members' creativity. The subject was 5 national universities at Chungcheong, Yeongnam and Honam (including Jeju) to investigate 6th grade or below faculty members by questionnaire who tested their leaders. Random sampling was used. Prior to distribution of the questionnaire, the author got cooperation from the universities to visit and to explain purpose of the study and contents of the questionnaire and to ask for anonymity of interviewees and no use of the finding for other purposes. 300 copies of the questionnaires were distributed, and 239 copies were finally used after excluding questionnaire collected having central tendency. SPSS 15.0 was used.

3.4. Contents of the questionnaire

The questionnaire had contents and source <Table 1>:

<Table 1> Construct Measurement

construct		supporting literature
transformational Leadership	Charisma	Bass(1985)
	Individual Consideration	
	Intelligent Stimulus	
Creativity		Zhou & George(2001)
Self-Efficacy		Kim & Cha(2003)
General		

3.5. Empirical analysis

SPSS 15.0 was used. Frequency analysis was done to investigate demographic characteristics. Cronbach's α coefficient was used to investigate internal consistency. Exploratory factor analysis was done to investigate uni-dimension and validity. Regression analysis was done to investigate effect of independent variables upon dependent variables.

4. Empirical analysis and hypotheses test

4.1. Demographic characteristics of the samples

The study investigated demographic characteristics to test hypotheses. 264 interviewees participated in the test: The questionnaires of 239 interviewees were finally used after excluding questionnaires of outlier and no answer. Demographic characteristics of the interviewees were <table 2>:

<Table 2> Demographic Variables

sex	frequency	%	age	frequency	%
1.00	129	58.4	1.00	5	2.2
2.00	92	41.6	2.00	25	10.8
sum	221	100.0	3.00	36	15.6
tenure	frequency	%	4.00	28	12.1
1.00	24	10.3	5.00	48	20.8
2.00	15	6.4	6.00	43	18.6
3.00	19	8.2	7.00	46	19.9
4.00	36	15.5	sum	231	100.0
5.00	16	6.9	education	frequency	%
6.00	123	52.8	2.00	40	17.6
sum	233	100.0	3.00	26	11.5
department	frequency	%	4.00	4	1.8
1.00	120	51.5	5.00	111	48.9
2.00	13	5.6	6.00	46	20.3
3.00	34	14.6	sum	227	100.0
4.00	53	22.7			
5.00	13	5.6			
sum	233	100.0			

4.2. Reliability and validity

Cronbach's α indicating internal consistency of variables was used to do reliability analysis. When making use of multiple items to test same concept, Cronbach's α finds out item of reliability lowering to exclude from test tool and to elevate reliability of test tool, and Cronbach's α with reliability of 0.6 or more(Nunnally, 1967) was used. In this study, exploratory factor analysis, Cronbach's α and confirmatory factor analysis were used to verify reliability and validity of the variables. Measuring scale subject to unidimensionality was used, and factor analysis found out variable having inherent value of 1 or more, and included factor loading of 0.40 or more and excluded communality of 0.5 or less. Results of reliability and validity analysis were <Table 3~Table 5>.

4.2.1 Reliability

Reliability analysis was done to investigate all of the questions and each variable (Table 3~Table 5), and charisma had Cronbach's α of 0.938 having very much high reliability, and individual consideration was 0.776 to be the lowest. At the analysis, reliability was 0.776~0.938 to have very much high internal consistency.

4.2.2 Validity

Factor analysis was done to investigate validity. Factor rotation reduced number of the variable of one factor to interpret factor (Varimax Rotation). In this study, factor loading of 0.40 or

more, eigen value of 1 or more, and communality of 0.5 or more were selected.

<Table 3> Reliability and validity of the Transformational Leadership

	factors		
	1	2	3
Charisma 18	.787	.214	.196
Charisma28	.685	.269	.310
Charisma27	.669	.449	.055
Charisma17	.666	.239	.441
Charisma26	.644	.369	.271
Charisma15	.632	.451	.236
Charisma3	.603	.405	.214
Charisma1	.593	.213	.493
Charisma2	.541	.406	.278
Charisma21	.529	.372	.382
Charisma5	.526	.440	.189
Charisma16	.524	.424	.317
Intelligent stimulus23	.395	.695	.065
Intelligent stimulus10	.144	.687	.260
Intelligent stimulus8	.116	.661	.385
Intelligent stimulus22	.361	.644	.320
Intelligent stimulus25	.365	.634	.227
Intelligent stimulus14	.299	.619	.182
Intelligent stimulus12	.437	.618	.298
Intelligent stimulus13	.480	.582	.136
Individual consideration20	.093	.144	.741
Individual consideration4	.301	.299	.653
Individual consideration9	.288	.528	.594
Individual consideration7	.203	.328	.585
Individual consideration19	.522	.327	.554
eigen value	15.576	1.304	1.150
factor loading	51.919	4.346	3.834
Cronbach's α	.938	.895	.776

At the analysis, all of initial 12 questions of charisma were found to be one factor, and 5 questions excluding 3 questions of individual consideration were found to be one factor. 8 questions excluding 2 questions of intellectual stimulus were found to be one factor. 11 questions excluding 1 question were combined, and 6 questions excluding 1 question of self-confidence were used. All of 5 questions of subject difficulty preference were found to be one factor. And, all of 12 questions of creativity were found to be one factor.

<Table 4> Reliability and validity of the Self-Efficacy

	factors		
	1	2	3
self-regulated efficacy19	.685	.075	.208
self-regulated efficacy20	.673	.158	.148
self-regulated efficacy12	.663	.014	.020
self-regulated efficacy17	.659	.129	.030
self-regulated efficacy8	.639	.057	.051
self-regulated efficacy7	.618	.170	-.135
self-regulated efficacy23	.604	.190	.121
self-regulated efficacy4	.593	-.012	-.013
self-regulated efficacy4	.567	.265	.093
self-regulated efficacy14	.545	-.031	.136
self-regulated efficacy21	.533	.095	.362
confidence13	.182	.776	.095
confidence3	.063	.770	-.031
confidence10	-.129	.715	.211
confidence16	.170	.704	.216
confidence11	.100	.662	.212
confidence1	.106	.611	.059
task difficulty preference15	.265	.058	.761
task difficulty preference22	.335	.016	.698
task difficulty preference9	-.193	.249	.614
task difficulty preference6	-.129	.130	.591
task difficulty preference18	.320	.053	.578
eigen value	6.236	2.880	1.959
factor loading	25.9789	11.999	8.162
Cronbach's α	.854	.827	.721

<Table 5> Reliability and validity of the Creativity

	factor
	creativity
creativity12	.733
creativity11	.733
creativity10	.725
creativity3	.716
creativity5	.689
creativity2	.688
creativity1	.678
creativity4	.676
creativity9	.675
creativity8	.613
creativity6	.532
creativity7	.531
eigen value	5.373
factor loading	44.772
Cronbach's α	.885

4.3. Hypotheses

In this study, concepts were tested by multi-item to standardize items having internal consistency at test and to make use of averaging single value, and investigation into correlation between factors prior to hypothesis test was done <Table 6>.

<Table 6> Correlation

	charisma	intelligent stimulus	individual consideration	creativity
charisma	1			
intelligent stimulus	.628(**)	1		
individual consideration	.555(**)	.591(**)	1	
creativity	.233(**)	.233(**)	.178(**)	1

4.3.1. Hypotheses of Transformational Leadership and Creativity

<Hypothesis 1> Leader's transformational leadership has positive influence upon members' creativity.

<Hypothesis 1-1> Leader's charisma has positive influence upon members' creativity.

Regression of hypothesis 1-1 was: At goodness-of-fit, 0.54 of R² was fit to the population. R² made correction to meet model and to judge by F. F of 13.506 was significant (P<.01) to be significant and to do linear regression. Input data were standardized with mean = 0 and standard deviation = 1 to examine beta value and t value, and beta of charisma was 0.233 and t value was 3.683 to be significant (P<.05), and charisma had positive influence upon members' creativity. Hypothesis 1 was adopted.

<Table 7> Regression analysis on the creativity of the leader's charisma and employee

category		Non-standardized coefficients		standardized coefficients	t
Independent variable	dependent variable	B	standard error	β	
(constant)		5.220	.162		32.209
creativity	charisma	.173	.047	.233	3.683**
R ² =.054, Adj R ² =.050, F=13.506***					

** = P<.05, *** = P<.01

<Hypothesis 1-2> Leader's individual consideration has positive influence upon members' creativity.

In regression of hypothesis 1-2, R² value for goodness of fit test was 0.032 to meet population. R² was corrected to meet population the most to judge by F value. F value was 7.693 to be significant (P<.01) and to do linear regression. Input data of

the effect of independent variable upon dependent variable were standardized with mean = 0 and standard deviation = 1 to investigate regression coefficient of Beta and t value and to have Beta of 0.178 and t-value of 2.774 and to be significant (P<.05). Leader's consideration had positive influence upon members' creativity. Hypothesis 2 was adopted.

<Table 8> Regression analysis on the creativity of the leader's individual consideration and employee

category		Non-standardized coefficients		standardized coefficients	t
Independent variable	dependent variable	B	standard error	β	
(constant)		5.034	.148		34.123
creativity	individual consideration	.122	.044	.178	2.774**
R ² =.032, Adj R ² =.027, F=7.693***					

** = P<.05, *** = P<.01

<Hypothesis 1-3> Leader's intellectual stimulus has positive influence upon members' creativity.

At regression analysis of hypothesis 1-3, R² of 0.054 met population. R² was corrected to meet population the most to judge by F value. F value was 13.547 to be significant (P<.01) to make linear regression.

Input data were standardized with mean = 0 and standard deviation = 1 to investigate effect of independent variable upon dependent variable and to have Beta value of 0.233 and t-value of 3.681 and to be significant (P<.05): Leader's intellectual stimulus had positive influence upon members' creativity. Hypothesis 3 was adopted.

<Table 9> Regression analysis on the creativity of the leader's intelligent stimulus and employee

category		Non-standardized coefficients		standardized coefficients	t
Independent variable	dependent variable	B	standard error	β	
(constant)		5.213	.160		32.509
creativity	intelligent stimulus	.177	.048	.233	3.681**
R ² =.054, Adj R ² =.050, F=13.547***					

** = P<.05, *** = P<.01

<Hypothesis 2> Self-efficacy has mediating effect when leader's transformational leadership has influence upon members' creativity.

At regression analysis, mediating effect had parameter of self-efficacy at relation between transformational leadership factor and creativity to test effects of the variable.

3-stage hierarchical regression(Baron and Kenny,1986) was done to investigate mediating variable of self-efficacy at relation

between transformational leadership and creativity. Following variables shall be satisfied to be parameter (Baron & Kenny, 1986).

First, independent variables have significant influence upon parameters. Second, independent variables have significant influence upon dependent variables. Third, parameters account for dispersion of dependent variables at regression equation. At adding of parameter in regression, β coefficient of independent variable falls down from significant level to insignificant level to do full mediating, and β coefficient does not fall down to insignificant level to have partial mediating relation.

First, independent variable of charisma accounts for parameter of self-efficacy significantly ($t=3.250$, $p<.01$) <Table 10>. Second, charisma accounts for dependent variable of creativity significantly ($t=3.683$, $p<.01$). Last, input of both charisma and self-efficacy at the same time account for creativity significantly: A little fall down of β coefficient of charisma is significant ($t=2.148$, $p<.05$), and self-efficacy partially mediated with relation between charisma and creativity. Charisma accounted for 4.3% of creativity variable, and model including both charisma and self-efficacy did 37.6% of creativity variable. Therefore, self-efficacy had mediating effect at influence of charisma upon creativity.

Self efficacy mediated intellectual stimulus and creativity <Table 11>: First, independent variable of intellectual stimulus did not account for parameter of self efficacy significantly ($t=.440$, $p>.05$). Second, intellectual stimulus accounted for creativity significantly ($t=3.681$, $p<.01$). Lastly, when inputting intellectual stimulus and self-efficacy at the same time, not only intellectual stimulus but also self efficacy accounted for creativity significantly. In the first stage, intellectual stimulus did not account for self efficacy significantly not to establish conditions for mediating effect test: Self efficacy had no mediating effect.

Self efficacy mediates not only individual consideration but also creativity <table 12>: First, independent variable of individual consideration accounts for parameter of self efficacy significantly ($t=3.237$, $p<.01$). Second, individual consideration accounts for dependent variable of creativity significantly ($t=2.774$, $p<.01$). Last, when inputting not only individual consideration but also self-efficacy at the same time, individual consideration does not account for creativity significantly, and accounts for not only self efficacy but also creativity significantly ($t=11.151$, $p<.01$). β coefficient of individual consideration falls down not to significant ($t=1.050$, $p>.05$), and self efficacy completely mediates relation between individual consideration and creativity. Individual consideration accounted for 4.3% of creativity, and model including both individual consideration and self efficacy accounted for 37.6% of creativity variable. Self efficacy was completely effective at the effect of individual consideration upon creativity.

<Table 10> Hierarchical regression for mediating effect test of self-efficacy at relation between charisma and creativity

parameter	stage	model	B	standard deviation	β	t-value	R^2
self efficacy	1	charisma→self efficacy	.129	.043	.207	3.250***	0.043
	2	charisma→creativity	.173	.047	.233	3.683***	0.054
	3	charisma→creativity	.084	.039	.113	2.148**	0.376
		self efficacy→creativity	.642	.058	.580	11.005***	

** = $P<.05$, *** = $P<.01$

<Table 11> Hierarchical regression for mediating effect test of self efficacy at relation between intellectual stimulus and creativity

parameter	stage	model	B	standard deviation	β	t-value	R^2
self efficacy	1	intellectual stimulus→self efficacy	.018	.042	.029	.440	0.001
	2	intellectual stimulus→creativity	.177	.048	.233	3.681***	
	3	intellectual stimulus→creativity	.166	.041	.218	4.045***	0.316
		self efficacy→creativity	.606	.064	.512	9.477***	

** = $P<.05$, *** = $P<.01$

<Table 12> Hierarchical regression for mediating effect of self efficacy at relation between individual consideration and creativity

parameter	stage	model	B	standard deviation	β	t-value	R^2
self efficacy	1	individual consideration → self efficacy	.128	.040	.206	3.237***	0.043
	2	individual consideration → creativity	.122	.044	.178	2.774***	0.032
	3	individual consideration → creativity	.038	.037	.056	1.050	0.367
		self efficacy → creativity	.655	.059	.592	11.151***	

** = $P<.05$, *** = $P<.01$

5. Conclusion

5.1. Summary

This study examined studies and literature of transformational leadership and creativity, and investigated members of national

universities empirically. Regression analysis was done to investigate effects of independent variables upon dependent variables. Regression formula was found to be statistically appropriate.

Charisma of leaders in national universities had positive influence upon creativity of members at test of hypothesis 1-1. Individual consideration of leaders in national universities had positive influence upon members' creativity. At the test of hypothesis 1-3, intellectual stimulus of leaders in national universities had positive influence upon members' creativity. Therefore, transformational leadership of leaders in national universities had positive influence upon members' creativity.

In this study, self-efficacy had mediating effects. Leaders' charisma had mediating effect upon self efficacy. But, self-efficacy had no mediating effect in the relation between intellectual stimulus and creativity. Leaders' intellectual stimulus had minor influence considering educational public official's job system and order system. Self efficacy had complete mediating effect in the effect of individual consideration upon members' creativity. Creativity is thought to be important for organizational survival and continuous development at rapidly changing education administration: Educational administration leaders should exercise transformational leadership to develop members' creativity. Member's self efficacy had mediating effect with creativity to require leadership that can develop members' self efficacy.

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