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Research Article

The impact of Transformational leadership on the organizational innovation

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Abstract: Stemming from leadership theory, this paper aims to investigate the relationship between Transformational leadership and organizational innovation. Relying on a sample of 103..Egyptian corporations, our findings suggest that transformational leadership affect organizational innovation , top management support mediates the relationship between transformational leadership and innovation input , resource supply mediates the relationship between transformational leadership and innovation outcomes, both of top management support and resource supply mediate the relationship between transformational leadership and innovation process .The discussion section offers implications for transformational leadership and innovation literature , as well as practical implications..

This study contributes to the research stream of transformational leadership, providing insights also to innovationand innovation climate literatureresearch.

Key Words: Transformational leadership, Organizational innovation, Innovation climate, Top management support, Resource supply, Innovation input, Innovation process, Innovation outcomes.

Introduction :

Organizations are now facing volatile environment, and a very rapid changes in business environment, which are imperative for organizations to be more innovative not only to gain but also to survive (Pieterseet al.,2010), that is the reason of the heavily researches discussing the factors affecting innovation.

Transformational leadership assumed to be a major determinant for innovation,Burns,(1978) described transformational leadership as a type of leadership that raises followers morality and motivation by four dimensions : Idealized influence, intellectual simulation, inspirational motivation, and individual consideration .But how Transformational leadership may affect innovation (Pieterse,A,et al.,2010) and Engelen et al.,(2014) illustrated that the effect of each dimension of transformational leadership may have a different influence on the organizational innovation.

Moreover some studies have argued that relationship was not always the same (Shin and Zhou,2003) which means that we need to explore mediating variables between them .

Here study assumed that innovation climate (top management support , resource supply) mediates the relationship between transformational leadership and organizational innovation, because effective leadership should build a supportive climate for innovation.(Uddin et al. 2017)

Innovation climate is a type of strategic climate, which support organizational goal, by improving ideas implementation, so it may affect the organizational innovation.

Transformational leadership may affect innovation climate(Aarons and Sommerfeld,2012) , But that relation is not simple as it appears , Transformational leadership may affect the climate of innovation by one or more dimensions , For example Howell and Avolio,(1993) Found that only two dimensions of transformational leadership (intellectual simulation and individualized consideration) affect the innovation climate , But Sarros et al.(2008) found another result, they found that (inspirational motivation and individual consideration) were positively and strongly related to innovation climate , while intellectual simulation did not have that strong relationship with innovation climate. Wang and Rode (2010) found that the climate of innovation moderated the relationship between transformational leadership and employee creativity, so we can conclude that the relationship between transformational leadership and innovation climate may be a mediator between transformational leadership and organizational innovation.

In this study transformational leadership, organizational innovation and innovation climate literatures are combined for more understand the relations between them.

Theoretical background:

A.Transformational leadership :

Burns was the first who introduced the concept of transformational leadership in 1978, in his book (leadership) , he was studying political leadership , but nowadays we are using transformational leadership concept in organizational studies,as the style that transforms followers to perform much better than they initially expected .(Bass,1985)

1).Transformational leadership dimensions :

1.1. Idealized influence:

Before naming this dimension "Idealized influence", Bass,(1985) used the term charisma to describe idealized influence, But when developing the model he discovered that the term idealized influence is better than charisma several reasons ; First, charisma represents several meanings in the media . Second, some researchers use the term charisma to as all-inclusive term for transformational leadership. Third, the term charisma associated with dictatorship leaders (Bass, 1999).

Max Weber was the first scholar who discussed charisma , he defined charisma at 1947 as a divine gift Allows the leaders to lead in novel ways .They are different from ordinary leaders ,because they have unique abilities that rouse and influence their followers .By Charisma leadership makes followers trust and honor them. (Ketan et al., 2014)

1.2. Inspiritional motivation:

Inspirational motivationdescribes the degree to which the leadership has a vision that inspiring followers and instill hope for the future (Bernard, 1997),in away to make that happen, the leader needs to motivate, communicate, and challenge his followers and provide meaning for the task . (Rumley, 2011)

1.3. Intellectual stimulation:

It means the leader ability to motivate his followers to think and to be creative (Fauji and Maulani,2013).

Accordingly, the leader will challenge assumptions, and solicits follower's ideas by giving them enough freedom to make creatively overcome.(Steven,2007)

1.4. individualized consideration:

The degree to which the leader meets the follower's need andlisten to the followers problems and concerns, It is also related to the degree to which the leader interested in follower's skill developments and growth. (Shahin and Wright,2004)

2). Innovation climate:

Innovation climate is a type of strategic organizational climate (Aarons and Sommerfeld,2013) , which contains the support for innovation and resource supply (Sarroset al., 2008) .

2.1. Support for innovation:

It measures how the employees view the organization open enough to change, flexible and respects creative functions.

Support for innovation means that the reward systems encourage innovation, and assistance in developing new ideas is readily available. (Scott and Bruce,1994)

2.2. Resource supply:

It indicates whether the resources of the organization enough to innovate or not , In other word there is adequate time, people, and funds to support developing and implementing creative ideas in the organization .

3). Organizational innovation:

Innovation is the implementation of an idea, which may be a new good, service, process, marketing method, or a new organizational method.

Organizational innovation is the implementation of a method that hasn't been used before in the organization, It result from the strategic decision that management has taken. (Meroño-Cerdán, and López-Nicolás,2017)

Organizational innovation may be administrative or technical, radical or incremental.

Administrative innovation is related to organization structures and administrative processes , on the other hand technical innovations include products (good,service), processes and technologies which used to produce products and services related to the activity of the organization.(Gopalakrishnan and Bierly,2001)

Radical innovation is a fundamental change in the organization processes, or in its industry, these changes cause a transformation of the organization or the industry, but incremental innovations are a marginal departure from the present practice, they only reinforce the present capabilities of the organization. (Gopalakrishnan and Damanpour, 1997)

Literature review :

A..Transformational leadership and organizational innovation:

Khan,et al.,(2009) Studied the relationship between transformational leadership and organizational innovation, assuming that organization size mediating the relation , the study argued that large organizations may have more capabilities,and that capabilities maximize the utilization of transformational leadership characteristics .

Al-Husseini&Elbeltagi,(2016) Studied Transformational leadership in both public and private sectors in Iraq's higher education institutions , and they found the four components of transformational leadership affect product and process innovation , but that relationships are stronger in the public institutions than private .

On the other side Junget al.(2008) assumed that organization culture (innovation climate/empowerment) , organization structure (centralization/formalization) and environment (competition/ uncertainty) mediating the relation , they found a positive relationship between transformational leadership and organizational innovation.

With another mediator variable, Uddinet al., (2017) studied the impact of transformational leadership, organizational learning and knowledge management on organizational innovation. The findings indicated that transformational leadership affects organizational innovation through organizational learning and knowledge management.

On the other hand ,Boerner et al.,(2007) studied the relationship at the individual level , they have found that debate completely mediates the relationship between transformational leadership and follower innovation, while

Liao et al., (2017) indicate that organizational learning is a mediating variable between Transformational leadership and organizational innovation , also the type of industry moderating the research model.

Although above studies have found a positive relationship between transformational leadership and organizational leadership ,Basu and Green,(1997) have found a strong negative relationship between transformational leadership and innovative behavior , While Simon and Ritossa,(2007) found no relation.

Hypothesis 1 : Transformational leadership will positively related to organizational innovation input .

Hypothesis 2 : Transformational leadership will positively related to organizational innovation process.

Hypothsis3 : Transformational leadership will positively related to organizational innovation outcomes.

B. Transformational leadership and innovation climate:

Wright,(2015) studied the relationship between transformational leadership and innovation climate , he found that there is a positive relationship, also Charbonnier-Voirin et al.,(2010) suggested that transformational leadership is more efficient when the work context support practices , norms and resources that promote innovation .whight,(2015) and Charbonnier-Voirin et al.,(2010) used scanning the external environment and building scenarios in estimating innovation climate, but (whight,2015) estimated whether the time practical support are enough to develop new ideas , the object that Charbonnier-voirin et al.,(2010) did not do in their study .

Sagnaket al.,(2015) and Nederveen,(2010)added a mediating variable to the relationship, and they found that transformational leadership is a significant predictor of innovation climate assuming that empowerment is a mediator variable .

ButSarros et al., (2008) results were deferent than those above, their result indicates that only two of dimensions of transformational leadership (inspirational motivation and individual consideration) were positively and strongly related to innovation climate , but intellectual simulation did not have the strongest relationship with innovation climate .

C. Transformational leadership, innovation climate and organizational innovation:

Jaiswal and Dhar,(2015) studied the relationship with an assumption that innovation climate mediate the relation , they found that transformational leadership support innovation climate which increase employee creativity level, Consistent with their result , Khalili,(2016) and Naami and Asadi,(2011)found that innovation climate has a great effect on innovation behavior.

Gumusluoğluand Ilsev,(2009) studied this relationship assuming that only internal and external support for innovation mediating the relationship , their study found that external support for innovation moderate the relationship , but the result did not support the assumption related to internal support , the authors justify that result ,because of the sample in their study includes micro and small sized companies that needs external support than internal.

Hypothesis 4: Top management support will mediate the relationship between transformational leadership and innovation input.

Hypothesis 5: Top management support will mediate the relationship between transformational leadership and innovation process.

Hypothesis 6: Top management support will mediate the relationship between transformational leadership and innovation outcomes.

Hypothesis 7: Resources supply will mediate the relationship between transformational leadership and innovation input.

Hypothesis 8: Resources supply will mediate the relationship between transformational leadership and innovation process.

Hypothesis 9:Resources supply will mediate the relationship between transformational leadership and innovation outcomes.

Method

Sample and data collection:

We collected questionnaires from the employees of 103 IT companies from small and medium sized enterprises (SMEs) . The companies are operating in generic software, e-commerce, and mobile application. To test the model and hypothesis utilizing Structural Equation Modeling (SEM) analysis with Partial Least Square (PLS) software , to determine whether the transformational leadership can influence organizational innovation input, process and outcome . the mediating variable was innovation climate . We used a questioner with Likert scale (1-5) , 1 for strongly disagree, and 5 for strongly agree.

Measurement

Transformational leadership were measured by the multifactor leadership questionnaire (MLQ-form 5X edited by Bass and Avolio,(1999) using the five dimensions :Idealized influence (attributed), Idealized influence (behavior), inspirational motivation, intellectual simulation, and individual consideration .

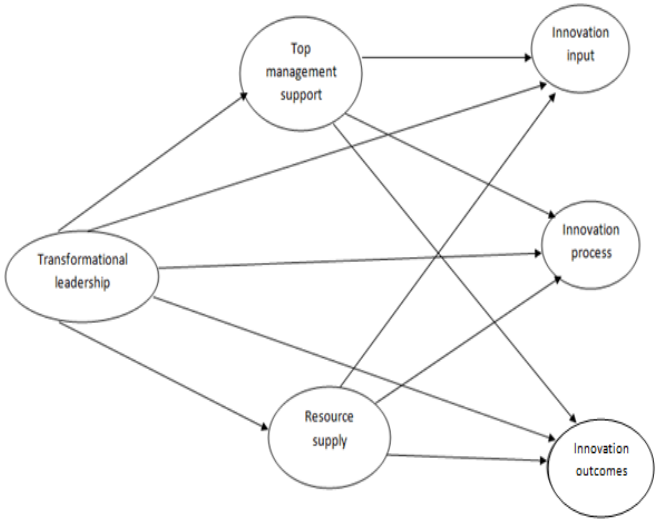
Innovation climate was measured by the measures developed by Scott and Bruce,(1994) . They used two dimensions: the support for innovation and resource supply.

Scott and Bruce,(1994) reported sufficient factorial validity and internal consistency reliability for their measures (α = 0.92 for support of innovation and 0.77 for resource supply)

Organizational innovation was measured by (innovation inputs, process and outcomes) the measures developed by Andrew and Haanaes,(2009)

Figure 1

Model : The relationship among Transformational leadership and organizational innovation (input, process and output) two dimensions of innovation climate mediate the relationship (top management support , resource supply)



Result and Discussion:

Validity tested in this study using convergent validity models with PLS software, SmartPLS v.3.2.2 was used in testing because it doesn't make identification problems, also it is appropriate to deal with non-normal data (Hair et al.,2013) .

Validity and Reliability of scales :

Convergent validity was assessed by examining the minimum requirements for factor loadings and the average variance extracted (AVE) of the constructs. A bootstrapping procedure, with 5000 subsamples, was applied to obtain inference statistics (Ringle et al.,2015) , Table (1) shows the average variance extracted (AVE) of each construct greater than 0.5 .Also the reliability test tested by composite reliability above 0.7 as it appears the table below:

Table (1) : outer model, discriminate validity and composite reliability

Variable	AVE	Composite Reliability	R Square
Transformational leadership	0.620	0.970	-
IIa	0.863	0.962	0.798
IIb	0.886	0.969	0.772
IM	0.754	0.925	0.788
IS	0.838	0.954	0.725
IC	0.783	0.935	0.673
TMS	0.866	0.951	0.455
RS	0.880	0.956	0.425
Innovation input	0.867	0.952	0.457
Innovation process	0.918	0.971	0.326
Innovation outcomes	0.945	0.981	0.348

Table (1) indicates that the value of AVE for each constructs is above 0.5 : Transformational leadership , Idealized influence attribute (IIa), Idealized influence behavior (IIb), Inspirational motivation (IM), Intellectual simulation (IS) , Individual consideration (IC) , Top management support (TMS), Resource supply(RS), innovation climate , innovation input, innovation process and innovation outcomes .

When AVE value is above 0.5, the indicators of each construct and questionnaire can be used to explain the variables.

We examined the relationships between transformational leadership and the organizational innovation (input ,process and outcomes) assuming that innovation climate (top management support , resource supply) mediates the relationship.

Transformational leadership was strongly and significantly related to Top management support and resource supply (β = 0.675 , P<0.05) , (β = 652,P<0.05) but weekly related to innovation input and outcomes (β= 0.440 , P<0.05)

Table (2): discriminate validity-cross loading:

	IIa	IIb	IM	IS	IC	TMS	RS	Innovation input	Innovation Process	Innovation Outcomes
IIa	0.929									
IIb	0.856	0.941								
IM	0.709	0.660	0.868							
IS	0.647	0.643	0.775	0.915						
IC	0.630	0.620	0.722	0.622	0.885					
TMS	0.574	0.511	0.577	0.639	0.628	0.938				
RS	0.533	0.490	0.620	0.631	0.557	0.635	0.922			
Innovation input	0.575	0.527	**0.573**	0.549	0.527	0.589	0.416	0.931		
Innovation Process	0.460	0.354	0.440	**0.461**	0.437	0.471	0.524	0.708	0.958	
Innovation Outcomes	0.434	0.415	0.451	**0.492**	0.386	0.355	0.552	0.663	0.725	0.972

The loading of an indicator on its assigned latent variable is higher than its loading on all other latent variables, according to Fornell –larcker as shown in table 2.

Also the table shows that innovation input highly correlated with inspirational motivation r = 0.573, and innovation process highly correlated with intellectual simulation r = 0.461, also innovation outcomes highly correlated with intellectual simulation.

2. Results from examining mediation impact:

The approach suggested by Preacher and Hayes (2004; 2008) is used to test the indirect relationships between constructs. The first step is to study the direct relationship between transformational leadership and organizational innovation (input, process, outcomes) . because the direct relationships was significant, the next step was measuring the indirect effects of transformational leadership on the organizational innovation (input, process, outcomes) by examining the relationships with mediators , then calculating the total effect of the transformational leadership on the organizational innovation (input, process, outcomes) , then calculating the variance accounted (VAF) mediation effects . the result shows that all of the VAF for significant relations are between 0.2 and 0.8 , so the variables has a partial mediating effect (

Preacher and Hayes,2004;2008).

The current study showed that direct path coefficient is significant. These findings support the findings of the study conducted by Al-Husseini&Elbeltagi,(2016), They also found significant relationship between transformational leadership and (innovation product and process).

In this study the relationship between transformational leadership was strong with innovation input (β = 0.636 ,*P*<0.05) , medium with innovation outcomes (β =0.503 , P <0.05) and weak with innovation process (0.496 , P>0.05) as demonstrated in table 3.

The next step is to examine the indirect path coefficient and total path coefficient , the result shows that Top management support mediates the relationship between transformational leadership and innovation input with the highest VAF value (VAF=0.308) , which means that if the company is in the stage of generating ideas it will needs top management support more than resource supply .

Also the result shows that top management support mediates the relationship between transformational leadership and innovation process (VAF = 0.337) and resources supply mediates the relationship (VAF = 0.46) . By testing them together we found that (VAF = 0.58) , Which means that innovation process needs both mediators together .Only resource supply mediates the relationship between transformational leadership and innovation outcomes (VAF = 0.387).

The results of examining the mediating variables are alignment with the results found by Gumusluoğluand Ilsev,(2009) . We reveal that transformational leadership affect organizational innovation (input, process, outcomes) but the mediators may vary according to the stage of innovation.

Also Gumusluoğluand Ilsev,(2009) found that one dimension of innovation climate does not mediate the relationship , so we can conclude that innovation climate may mediates the relationship by one or more than one dimension , and this variation in results may be because of the size of the firms had been studied ,

Results from examining the mediation impacts:

Table (3) direct path coefficient without mediators:

Direct path coefficient without mediators			
Exogenous variable (Ex)	Endogenous variable (En)	$\beta^{(sig.)}$	Decision
Transformational leadership	Innovation input	0.636***	Significant, go to step (2)
	Innovation process	0.496***	
	Innovation outcomes	0.503***	

*** significant level is 99.9% , P value < 0.001, t value ±3.21.

** significant level is 99%, P value < 0.01, t value ±2.58.

Table (4) : Indirect path coefficients with the mediator :

Indirect path coefficients with the mediator = (exogenous to mediator, mediator to endogenous)			
Path	Top management support (M1)	Resource supply (M2)	M1 and M2
	$\beta^{(sig.)}$	β	β
(Ex-En1)	0.196***	0.003	0.151*
(Ex-En2)	0.167***	0.228***	0.29**
(Ex-En3)	0.017	0.253***	0.195*

*** significant level is 99.9% , P value < 0.001, t value ±3.21.

** significant level is 99%, P value < 0.01, t value ±2.58.

Table (5) : Total path coefficient with mediator :

Total path coefficients with the mediator = (Direct + indirect effect)						
Path	Top management support (M1)		Resources supply(M2)		(M1 and M2)	
	$\beta^{(sig.)}$	R^2	$\beta^{(sig.)}$	R^2	$\beta^{(sig.)}$	R^2
(Ex-En1)	0.635***	0.450	0.636***	0.404	0.635***	0.455
(Ex-En2)	0.496***	0.280	0.495***	0.316	0.496***	0.325
(Ex-En3)	0.503***	0.254	0.503***	0.340	0.504***	0.348

*** significant level is 99.9% , P value < 0.001, t value ±3.21.

** significant level is 99%, P value < 0.01, t value ±2.58.

Table (6) : Mediation effect variance accounted :

Mediation effect Variance accounted for VAF = (indirect effect/ total effect)						
Path	Top management support (M1)		Resource support (M2)		(M1 and M2)	
	VAF	Decision	VAF	Decision	VAF	Decision
(Ex-En1)	0.308	Partial mediation	-	No mediation	0.24	Partial mediation
(Ex-En2)	0.337	Partial mediation	0.46	Partial mediation	0.58	Partial mediation
(Ex-En3)	-		0.502	Partial mediation	0.387	Partial mediation

*** significant level is 99.9% , P value < 0.001, t value ±3.21.

** significant level is 99%, P value < 0.01, t value ±2.58.

Conclusion:

Although the results have shown a significant relationship between transformational leadership and organizational innovation (input, process, outcomes) , Top management support does not mediate the relationship between transformational leadership and innovation outcomes , and resource support does not mediate the relationship between transformational leadership and innovation input .

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