The Effects of Leadership Styles on Innovative Work Behavior and the Role of Locus of Control in the Manufacturing Environment

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With the decline of manufacturing in the United States, there is a need for increased employee innovation. This survey research examined the role of locus of control, leadership style, and innovative work behavior in the manufacturing industry using variance-based structural equation modeling. We tested the moderating roles of both internal and external locus of control on the leadership style and innovative work behavior and found positive significant relationships for transformational and transactional leadership styles and innovative work behavior.

INTRODUCTION

The global economy increased pressure on the manufacturing industry to develop better products using efficient processes to gain market share. Manufacturing companies need innovative employees who challenge the traditional boundaries to explore opportunities, and processes that leverage company assets and create value. Organizational leadership is an essential factor affecting an employee's creativity and innovative performance (Jung, Chow, & Wu, 2003). As managers continually seek new ways to lead employees, they must develop styles that encourage innovation and promote sustainability in manufacturing organizations. Transformational leaders are known for actively engaging their followers' value systems which extends beyond mere transactional arrangements (Bass, 1985; Gardner & Aviolo, 1998) and is shown to improve organizational results. Howell and Avolio (1993) found that transformational leadership was related to higher internal locus of control and positively predicted business performance. Transactional leadership including contingent reward and management-by-exception (active and passive) were negatively related to business performance (Howell & Avolio, 1993). Bass and Aviolo's (1994) characterizations of transformational leadership included intellectual stimulation which promoted creativity and innovation.

The purpose of our research was to examine the role of locus of control in the relationship between leadership style and innovative work behavior in manufacturing organizations. We considered transformational and transactional leadership styles and internal and external locus of control to examine the following research question and hypothesis.

Research Question

What is the role of locus of control in the relationship between transformational and transactional leadership styles and innovative work behavior in the manufacturing industry?

H1. *There is a positive relationship between transformational leadership and innovative work behavior in the manufacturing industry.*

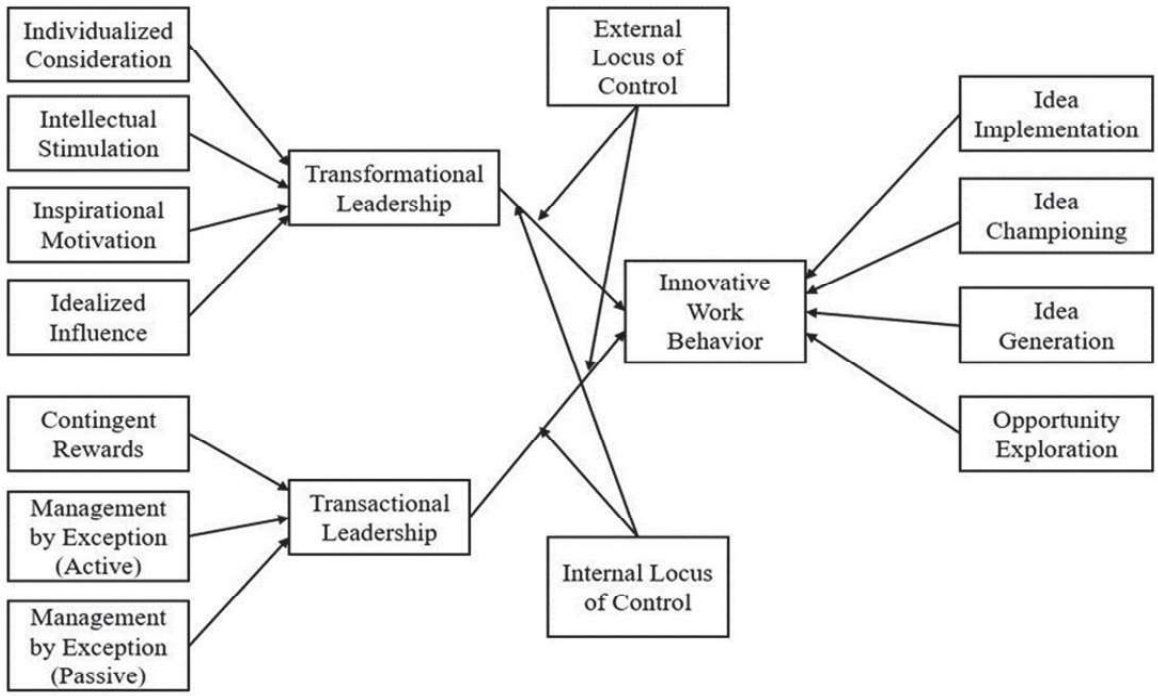
H2. *There is a positive relationship between transactional leadership and innovative work behavior in the manufacturing industry.*

The structure of our paper is as follows. First, we define the constructs innovative work behavior, transactional leadership, transformational leadership and locus of control and the dimensions of the constructs. Next, we examine the theoretical foundations for transformational and transactional leadership styles on innovative work behavior and the role of locus of control. Then we explain the methodology used to survey manufacturing employees and the results. Finally, we discuss our analysis and implications for improving employee innovation in the manufacturing industry.

LITERATURE REVIEW

In preparing the background for the research, we analyzed the constructs from the theoretical perspective and the linkages between constructs. Figure 1 shows the research model for innovative work behavior (IWB) with the antecedents for transformational and transactional leadership. Our research used the constructs innovative work behavior, the internal and external locus of control, and transformational and transactional leadership styles.

FIGURE 1
RESEARCH MODEL



Innovative Work Behavior

Jaehoon Seo Dae, Bozorov, and Dedahanov (2017) found that innovative organizations tend to have higher levels of productivity and economic growth compared to companies that do not innovate at all. The innovative behavior of employees plays a vital role for organizations to survive and to run their business operations efficiently. According to Kanter (1983), "Innovation is the generation, acceptance, and implementation of new ideas, processes, products, and processes," (p. 20). The form that innovation takes may vary by the type of industry or business structure. However, innovation is necessary for economic health, and organizations must innovate to adapt to unfamiliar situations (Kanter, 1983).

Scott and Bruce (1994) defined innovative behavior as the implementation of an employee's ideas along with their creation and promotion. West & Farr (1989), stated that innovative work behavior represents actions of individuals that involve "intentional introduction and application (within individual, group, or organization) of ideas, processes, products or procedures which are relevant to the new unit of adoption, designed to significantly benefit the individual, the group, organization or wider society" (p. 9).

The value of innovation for success in organizations is a widely accepted concept in the research. Innovative behavior applies to products, processes, and procedures in a person's role in the workplace. In her seminal book, Kanter (1983) framed the topic as innovative behavior and innovative processes in organizations. Innovative behavior can be carried out both by some individual, organizational members, or groups of individuals within an organization and is a broader concept than creativity. True innovative behavior presents a variety of behaviors involved in the generation, promotion, and implementation of new ideas. In general, management research on innovative behavior focuses on the human aspect versus the technical aspect, of innovation. Innovation as a term makes most think about technology in the form of new products and new production methods. It may create the image of an invention such as a new version of the cell phone, for example.

For this research, we defined innovative work behavior as more than creativity and included exploring opportunities, generating ideas, championing ideas, and leading the implementation. To measure innovative work behavior, we used a ten-item scale developed by De Jong and Den Hartog (2008). The dimensions of innovative work behavior evaluated in the scale were opportunity exploration, idea generation, idea championing, and idea implementation. De Jong and Den Hartog used a pilot study of 81 matched dyads of knowledge workers and their supervisors to develop an initial measure and then refined the instrument with a sample of 703 employees from 94 small knowledge-intensive firms in the Netherlands. Reliability was good for all items ($\alpha > .70$, mean correlation > .40, and IRCs > .30). Their four-factor model performed better than competing models. Other researchers used De Jong and Den Hartog's instrument for measuring innovative work behavior as a reliable scale (i.e., Afsar, Badir, & Bin Saeed, 2014; De Spiegelaere, Van Gyes, De Witte, Niesen, & Van Hootegem, 2014).

The hypotheses which are related to paths for measuring IWB are:

H3*. Opportunity exploration will have a positive relationship with IWB.*

H4*. Idea generation will have a positive relationship with IWB.*

H5*. Idea championing will have a positive relationship with IWB.*

H6*. Idea implementation will have a positive relationship with IWB.*

Locus of Control

Locus of control (LOC) was first conceptualized as a principle by Julian Rotter in 1954 as being internally or externally oriented. Individuals with an internal LOC believe that their control exists within themselves, while individuals with an external LOC believe circumstances and chance control their outcomes (Rotter, 1954). LOC is based on social learning theory, which considers man's behavior as determined by his or her goals, and behavior is always directional, meaning that people will respond with behaviors that lead to the greatest satisfaction in situations (Rotter, 1964).

Rotter (1990) described the internal LOC as the degree to what people expect that their behavior outcome or reinforcement of behavior is contingent on their own behavior or personal characteristics. Conversely, external LOC is described as the degree to what people expect their behavior outcome or reinforcement of behavior is a result of chance, or fate, under the control of others and is not predictable. LOC is a spectrum with internal and external falling at opposite ends. An individual's LOC may fall anywhere along the spectrum or even be balanced in both internal and external LOC.

For our research, we measured locus of control by a six-item scale developed by Rotter (1996) which built on Lumpkin's (1985) scale. Lumpkin recommended a Likert scale format opposed to the bipolar statements used by Rotter which is consistent with LOC being a spectrum. We used three Likert scale items for internal orientation, and three items for chance (external orientation) for this research. Lumpkin indicated sufficient internal consistency and reliability (α = .68) for the instrument and correlated his measure with other measures of locus of control from prior research.

Transformational and Transactional Leadership

The theory of transformational leadership, according to Burns (1978), emphasized followers' needs, values, and morals. The transforming leader has the role of recognizing and exploiting the wants, needs, demands, and unmet expectations of followers or potential followers. Additionally, transformational leadership goes further to engage the whole person in a moral process that is mutually stimulating and elevating. The transformational leader possesses these and other effective characteristics, as suggested by Burns (1978) and Bass (1985).

Transactional leadership is defined as the exchange process based on fulfilling contractual obligations and involves setting objectives and monitoring and controlling outcomes (Antonakis, Avolio, & Sivasubrananiam, 2003). Antonakis, Avolio, and Sivasubrananiam (2003) stated that this leadership model is made up of the three first-order factors:

1. Contingent reward (CR) refers to leader behaviors that are focused on clarifying role and task requirements and providing followers with material or psychological rewards contingent on fulfillment of contractual obligations.
2. Management-by-exception, active (MBEA): refers to the vigilance of a leader whose goal is to make sure that standards are met.
3. Management-by-Exception (MBEP), passive: refers to a leader who intervenes only after noncompliance has occurred or when errors have already happened.

To measure transformational and transactional leadership, we used the MLQ (5X) 7-point Likert scale items developed by Bass and Avolio (1994). There were ten items for the dimensions of transformational leadership that included individualized consideration, intellectual stimulation, inspirational motivation, and idealized influence. The hypotheses for the paths for measuring transformational leadership (TFL) are:

***H7**. Individualized consideration will have a positive relationship with TFL.*

***H8**. Intellectual simulation will have a positive relationship with TFL.*

***H9**. Inspirational motivation will have a positive relationship with TFL.*

***H10**. Idealized influence will have a positive relationship with TFL.*

We measured transactional leadership by six items for contingent reward, management by exception active, and management by exception passive. Avolio, Bass, and Jung (1999) examined the reliability and validity of the MLQ (5X) and found the instrument adequately represented transformational and transactional dimensions. The hypotheses for the paths for measuring transactional leadership (TAL) are:

***H11**. Contingent reward will have a positive relationship with TAL.*

***H12**. Management by exchange (active) will have a positive relationship with TAL.*

***H13**. Management by exchange (passive) will have a positive relationship with TAL.*

Leadership and Innovative Work Behavior

Other researchers have shown the benefits of transformational leadership in organizational environments. Jung, Chow, and Wu (2003) found a positive relationship between transformational leadership and innovation in a survey of 32 Taiwanese electronics and telecommunications companies using partial least squares structural equation modeling. Noruzy, Dalfard, Azhdari, Nazari-Shirkouhi, and Rezazadeh (2013) examined relationships between transformational leadership, organizational learning, knowledge management, organizational innovation, and organizational performance among Iranian manufacturing companies. In a survey of 286 managers from 106 companies with more than 50 employees, they found that transformational leadership positively influenced organizational innovation and performance of manufacturing firms. Khan, Naeem, and Riaz (2012) examined the relationship between transformational, transactional, and laissez-faire leadership and innovative work behavior in public and private banks in Pakistan and found that transformational leadership in public banks resulted in a positive relationship with innovative work behavior. The transactional leadership styles used in the private sector resulted in negative effects on innovative work behavior (Khan, Naaem, & Riaz, 2012).

Since transformational leadership is linked to enhancing a follower's motivation to high performance, we developed the hypothesis for our research that there would be a positive relationship between transformational leadership and innovative work behavior. The relationship between transactional leadership and innovative work behavior indicated mixed findings in the literature. Lee (2008) found that transactional leadership had a negative relationship with innovativeness based on a survey of 201 research and development personnel in Singapore. Dayan, Di Benedetto, and Colak (2009) found a positive correlation between transactional leadership and product development for research and develop teams. Rosing, Frese, and Bausch (2011) performed a meta-analysis on studies for leadership and innovation and found that the interaction of transactional leadership and innovation research lacked consistent findings. Kheng, June, and Mahmood (2013) maintained that there was a positive relationship between Leader-Member Exchange and innovative work behavior ($r = .41$, $p<.01$) based on survey results for 318 survey responses from knowledge-intensive service workers in Malaysia. Based on these findings, we developed the exploratory hypothesis that a positive relationship between transactional leadership and innovative work behavior existed in the manufacturing environment.

Locus of Control and IWB

An internal locus of control and innovative work behavior are considered desired traits for organizational success. Mueller and Thomas (2001) identified the internal locus of control and innovativeness as two traits necessary for entrepreneurial activity in their research examining which cultures were more conducive to entrepreneurship. Khan and Manopichetwattana (1989) surveyed 50 Texas manufacturers using Rotter's (1966) instrument and found that the innovative entrepreneur had an internal locus of control using correlation analysis. Pannells and Claxton (2008) found that internal locus of control and creativity were not significantly correlated ($r = -.14$, $p = .21$), but external locus of control and creativity were significantly correlated ($r = .26$, $p = .01$) in a total sample of 179 college students. For this research, we developed the hypotheses that both external and internal locus of control had positive relationships with innovative work behavior.

***H14**: External locus of control has a positive relationship with innovative work behavior.*

***H15**: Internal locus of control has a positive relationship with innovative work behavior.*

Other researchers examined the relationships between leadership, innovative work behavior, and locus of control. Howell and Avolio (1993) studied transformational leadership, transactional leadership, locus of control, and support for innovation to predict business unit performance over a one-year interval. They found transformational leadership related to a higher internal locus of control and positively predicted business performance and transactional leadership negatively predicted business performance using partial least squares (PLS). Gumusluoglu and Ilsev (2009) found a significant correlation between transformational leadership and creativity in research and development employees at Turkish software development companies ($\gamma = 0.25$, $p<0.05$), but did not find that intrinsic motivation mediated the relationship. Al-Husseini and Elbeltagi (2016) discovered that transformational leadership (TL) influenced innovation, leading to increased goal-directed behavior on the part of followers, promoting organizational change, and a spirit of trust, and helping followers to exceed their performance expectations. In questionnaires and interviews administered to 439 teaching staff and ten leaders from the public and private higher education institutions in Iraq, they examined the impacts of TL on product and process innovation. Using structural equation modeling, they found that TL enhanced product and process innovation and expressed the need for study in the manufacturing sector.

Muenjon and McMurray (2016) discovered that few studies explored the relationships between work values ethics and workplace innovation at the individual level and links to leadership behavior and style. Using a survey of 696 respondants in Thai and Vietnamese manufacturing SMEs, they found that design leadership differed in Thai and Vietnamese companies with Thai respondants considering workplace leadership and innovation more critical than Vietnamese respondants. O'Regan, Ghobadian, and Sims (2006) analyzed small and medium enterprises in the United Kingdom electronics and engineering sector and found a close association between strategy, organizational culture, leadership, and innovation using factor and correlation analyses.

Demeško (2017) examined the role of locus of control (LOC) in the relationship between two leadership styles (transformational and transactional) and innovative work behavior (IWB) in the Baltic States using a sample of 106 employees of a large aircraft maintenance company. The results of this study suggested moderation effects of internal LOC in the relationship between transformational leadership and IWB, along with the moderating effects of external LOC on the relationship between transactional leadership style and IWB. The study used correlation and multiple regression statistical analyses and determined that the role of locus of control as a moderator was not confirmed. The results of statistical analyses illustrate that LOC shows correlation with leadership styles, however, does not show correlation with IWB. The results presented evidence of dual control in the ability of individuals to possess both internal and external LOC simultaneously. Demeško (2017) recommended that future research expand the population from a small sample size and to multiple industries.

To address the relationship between transformational leadership, innovative work behavior, and locus of control, we developed the following hypotheses.

***H16**: Higher levels of external LOC will have a larger significant relationship for transactional leadership and IWB.*

***H17**: Higher levels of internal LOC will have a larger significant relationship for transformational leadership and IWB.*

***H18**: There will be a difference in the significant relationship with transformational leadership and transactional leadership on IWB, with transformational leadership being stronger.*

METHODOLOGY

We used a quantitative field survey with standardized scales via a web link that was distributed to 1,696 individuals working in the manufacturing industry in the United States to determine the perceptions of employees about their IWB characteristics, their LOC, and their supervisors' management style. To

test for nonresponse bias, we left the survey open for one month as suggested by Oppenheim (2001). Latent variables for leadership attributes, LOC, and IWB that could not be measured directly were used in the research model. We used variance-based partial least squares structural equation modeling (PLS-SEM) which is appropriate for the research philosophically since the research is in the exploratory stage of theory development (Urbach & Ahlemann, 2010). PLS-SEM is also appropriate because the research model shown in Figure 1 is complex with minimal theoretical bases, and causal predictive analysis is needed (Joreskog & Wold, 1982) for constructs with non-normal variable distributions (Gefen et al., 2000; Chin et al., 2003).

We distributed the survey link by email using a list of employees who were at least 18 years old belonging to professional manufacturing organizations and employed full-time in manufacturing companies with at least 100 employees. The survey consisted of demographic questions, ten items for innovative work behavior, ten items for transformational leadership, six items for transactional leadership, and six items for locus of control which is shown in Appendix A. Out of the 1,696 individuals who were emailed the link, 376 individuals opened the survey and 234 completed the survey resulting in a 13.8% response rate. Table 1 shows the sample demographics for the 234 individuals completing the survey. The sample size of 234 exceeded the recommended sample size of 81 to determine a minimum effect of 0.10 ($p < .05$) with a power of at least 0.80 (Cohen, 1992).

TABLE 1
SAMPLE DEMOGRAPHICS

Characteristic	N	Frequency (%)
Age		
18-25 years	69	29.5
26-40 years	130	55.6
Over 40 years	35	15.0
Gender		
Male	156	66.7
Female	78	33.3
Employee's Education Level		
Less than high school	2	0.9
High school diploma or GED	14	6.0
Some college/no degree	14	6.0
Associate degree	14	6.0
Bachelor's degree	134	57.3
Graduate degree	56	23.9

To determine if common method bias was present, we loaded all items into an exploratory factor analysis in SPSS with an unrotated solution. Harman's single factor test that showed less than 30% of the variance was explained by a single variable indicating no cause for concern (Podsakoff, Mackenzie, Podsakoff, & Lee, 2003).

RESULTS

We performed PLS-SEM in two stages. First, we assessed the validity (convergent and discriminate) and the reliability of each indicator forming the latent variables. For the PLS-SEM analysis, mean value replacement was used if there were less than 5% of the values missing per indicator; otherwise casewise deletion was used. We examined the outer loadings of indicators for convergent validity using the criteria of indicators exceeding 0.70, the average variance extracted (AVE) exceeding 0.50, and rho_A exceeding .70 (Hair et al., 2017). Table 2 shows the construct and indicators of transformational leadership with

factor loadings, Cronbach's alpha, average variance extracted, rho_A, and composite reliability. Based on the information provided in Table 2, the Cronbach's alpha values for the subdimensions of transformational leadership exceeded .70 except for individual consideration and intellectual stimulation. However, the composite reliabilities and average variance extracted exceeded the recommended thresholds. Since the research is exploratory, we retained individual consideration and individual stimulation as subdimensions of transformational leadership.

TABLE 2
CONSTRUCT INDICATORS OF TRANSFORMATIONAL LEADERSHIP

Indicators / Items	Code	FL	Cron Alpha	AVE	rho_A	Comp Rel
Individual Consideration			.644	.737	.646	.849
Manager treats as individual	IndCon1	0.868				
Manager considers my needs, abilities, inspirations	IndCon2	0.850				
Intellectual Stimulation			.659	.746	.660	.854
Manager reexamines critical assumptions	IntStim1	0.857				
Manager gets me to look at problems from different angles	IntStim2	0.870				
Inspirational Motivation			.715	.778	.717	.875
Manager talks optimistically about future	InsMot1	0.874				
Manager expresses confidence goals will be achieved	InsMot2	0.890				
Ideal Influence			.812	.641	.818	.878
Manager goes beyond self-interest for the good of group	IdInf1	0.829				
Manager acts in ways that builds my respect	IdInf2	0.828				
Manager specifies the importance of having a strong sense of purpose	IdInf3	0.820				
Manager considers the moral and ethical consequences of decisions	IdInf4	0.721				

Similarly, Table 3 shows the construct and indicators of transactional leadership. Based on the information in Table 3, the Cronbach's alpha values for the subdimensions of transactional leadership exceeded or were extremely close to .70. The composite reliabilities, rho_As, and AVEs exceeded or were very close to the recommended thresholds.

TABLE 3
CONSTRUCT INDICATORS OF TRANSACTIONAL LEADERSHIP

Indicators / Items	Code	FL	Cron Alpha	AVE	rho_A	Comp Rel
Contingent Reward			.699	.768	.710	.869
Manager specifies who is responsible for performance target	ConRew1	0.867				
Manager makes clear what is received when goals met	ConRew2	0.886				
Management by Exchange (Active)			.698	.767	.710	.868
Manager deals with mistakes and failure	ManExcA1	0.896				
Manager keeps track of all mistakes	ManExcA2	0.855				
Management by Exchange (Passive)			.758	.805	.759	.892
Manager waits for things to go wrong before action	ManExcP1	0.902				
Manager only fixes what is broken	ManExcP2	0.892				

Table 4 shows the construct and indicators of locus of control. All factor loadings, Cronbach's alpha values, AVEs, rho_As, and composite reliabilities exceeded the recommended values.

TABLE 4
CONSTRUCT INDICATORS OF LOCUS OF CONTROL

Indicators / Items	Code	FL	Cron Alpha	AVE	rho_A	Comp Rel
Internal LOC			.884	.811	.888	.928
Certain can make plans work Depends on ability – luck not a factor	IntCon1 IntCon2 IntCon3	0.911 0.885 0.906				
External LOC			.905	.834	.990	.938
Unhappy things in life are due to bad luck	Ch1	0.896				
Good job depends on right place at right time	Ch2	0.933				
Have little influence over things that happen to me	Ch3	0.927				

Table 5 shows the construct and indicators for Innovative Work Behavior. All factor loadings, Cronbach alpha values, AVEs, rho_As, and composite reliabilities exceeded the recommended values except for opportunity exploration which was eliminated from the analysis.

TABLE 5
CONSTRUCT INDICATORS OF INNOVATIVE WORK BEHAVIOR

Indicators / Items	Code	FL	Cron Alpha	AVE	rho_A	Comp Rel
Idea Generation			.721	.643	.724	.843
Search out new working methods or techniques Generate original solutions for problems Find new approaches to execute tasks	IdGen1 IdGen2 IdGen3	0.771 0.796 0.837				
Idea Championing			.692	.764	.699	.866
Unhappy things in life are due to bad luck	IdChp1	0.891				
Good job depends on right place at right time	IdChp2	0.857				
Idea Implementation			.757	.672	.761	.757
Introduce innovative ideas into workplace	II1	.830				
Contribute to implementation of new ideas	II2	.811				
Put effort into the development of new things	II3	.818				
*Opportunity Exploration**			.491	.657	.533	.792
Pay attention to issues not part of daily work	OpEx1	.382				
Wonder how things can be improved	OpEx2	.552				

* Opportunity Exploration as a latent variable was eliminated from further analysis.

We tested the discriminant validity for all variables in the model. Table 6 shows the results using the Fornell-Larcker criterion and heterotrait-monotrait ratio (HTMT). From Table 6, the square-root of the AVE on the diagonal line is greater than the correlations between constructs in the model except for the second order latent variables which were defined by all indicators for the first order latent variables. The constructs in the research model meet discriminant validity recommendations.

We also use HTMT to test discriminant validity. The HTMT values are above the diagonal in Table 6. The results show that the HTMT values are less than 0.90 except for the constructs of the second order latent variables that were defined by the first order latent variables' indicators. The recommended requirements for discriminant validity were met (Hair et al., 2017).

TABLE 6
CORRELATIONS AND DISCRIMINANT VALIDITY RESULTS

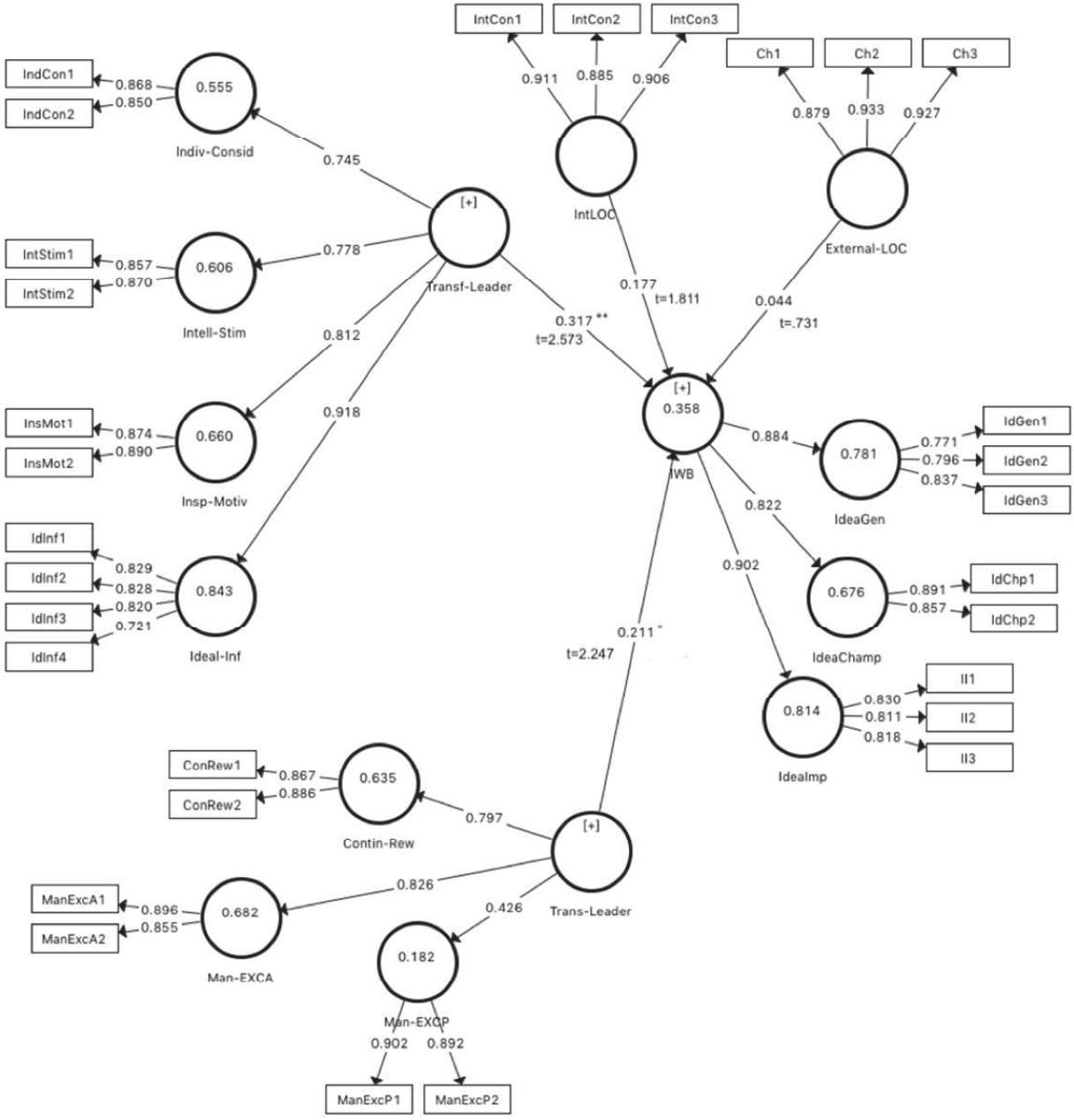
Construct	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 ConRew	.88	.31	.49	.50	.51	.47	.63	.72	.70	.46	.84	.66	.13	1.03	.76
2 Ch	.26	.91	.26	.28	.19	.28	.24	.41	.31	.09	.29	.41	.50	.58	.32
3 IWB	.40	.25	.68	1.03	1.11	1.09	.59	.48	.59	.45	.55	.50	.29	.61	.63
4 IdChp	.35	.24	.82	.87	.86	.89	.58	.47	.55	.44	.47	.57	.30	.65	.58
5 IdGen	.37	.18	.88	.61	.80	.92	.53	.44	.54	.43	.52	.43	.24	.58	.56
6 II	.35	.25	.90	.66	.69	.82	.60	.43	.58	.39	.53	.52	.35	.63	.60
7 IdInf	.47	.21	.50	.44	.40	.47	.80	.79	.86	.32	.84	.51	.10	.71	1.10
8 IndCon	.48	.30	.35	.32	.30	.30	.58	.86	.74	.45	.74	.52	.09	.99	.99
9 InsMot	.50	.26	.47	.39	.39	.43	.66	.50	.88	.38	.78	.54	.09	.72	1.01
10 IntCon	.36	.10	.39	.35	.34	.32	.27	.34	.31	.90	.50	.38	.14	.51	.43
11 IntStim	.57	.23	.41	.32	.36	.38	.61	.48	.54	.38	.86	.71	.07	.82	1.02
12ManExcA	.47	.34	.40	.40	.31	.38	.39	.36	.39	.31	.49	.88	.36	1.06	.62
13 ManExcP	.09	.41	.25	.22	.18	.26	-.06	-.01	-.06	.11	.04	.26	.90	.70	.09
14 Transact	.80	.46	.51	.48	.43	.47	.52	.62	.50	.42	.60	.83	.43	,71	.86
15 Transform	.60	.29	.54	.46	.45	.49	.92	.75	.81	.38	.78	.49	-.03	-.15	.82

*Diagonal elements are the square roots of the AVE (average variance extracted)
**Below the diagonal elements are the correlations between the construct values. Above the diagonals are the HTMT values

We evaluated the structural model, the quality of the model, and examined the research hypotheses using the SmartPLS 3 program (Ringle, Wende, & Becker, 2015). PLS-SEM does not require normality of data and can be used to test causal-predictive relationships between latent variables simultaneously (Joreskog & Wold, 1982). The results of the structural model using SmartPLS 3 with a 5,000 resampled bias-corrected and accelerated bootstrapping are shown in Figure 2. The paths from internal locus of control to innovative work behavior and external locus of control to innovative work behavior were not significant. SRMR was .109 and RMS_{theta} was .159. Hair, Hult, Ringle, and Sarstedt (2017) stated that the SRMR and RMS_{theta} fit tests offered little value because PLS-SEM is focused on predication rather than explanatory modeling.

In Figure 2, the individual antecedents of transformational leadership and transactional leadership explain 35.8% of innovative work behavior. The value indicated that the ability of transformational and transactional leadership styles to explain innovative work behavior was in the weak to moderate range (Hair et al., 2017). The variance inflation factors (VIFs) for all independent variables in the model were less than 3.070, indicating no collinearity issues.

FIGURE 2
PLS-SEM



Note: *p<.05, **p<.01

To determine the out-of-sample predictive power or relevance, we used blindfolding by omitting every seventh case. The Q^2 values ranged from .136 to .515 which were greater than 0 indicating predictive power or relevance. The effect size of each latent variable predicting innovative work behavior was calculated using the R^2 included, and R^2 excluded., We removed the latent variable from the model to calculate R^2 excluded and ran the PLS algorithm without the variable. For all latent variables measuring transformational leadership (individualized consideration, intellectual stimulation, inspirational motivation, and idealized influence), the effect size was greater than 0.35 indicating a large effect on innovative work behavior. For all latent variables measuring transactional leadership (contingent rewards,

management by exception active, and management by exception passive), the effect size was greater than 0.35 indicating a large effect on innovative work behavior (Hair et al., 2017).

We then examined the moderating relationships for significance. Direct paths from the moderating constructs internal locus of control and external locus of control to innovative work behavior were used in addition to the interaction effects as recommended by Hair et al. (2017). The moderating effect of internal locus of control on the relationship between transformational leadership and innovative work behavior was not significant (t=0.407, p=.684) and was also not significant for transactional leadership (t= 1.097, p=.273). The moderating effect of external locus of control on the relationship between transformational leadership and innovative work behavior was not significant (t=0.262, p=.793) and was also not significant for transactional leadership (t=.003, p=.998).

We tested the hypotheses (direct effect) before testing the hypotheses (interaction). We found that H1 was supported since there was a positive relationship between transformational leadership and innovative work behavior in the manufacturing industry (β = .317, p < .01). H2 was also supported since there was a positive relationship between transactional leadership and innovative work behavior (β = .211, p < .05). H3 was not supported since opportunity exploration did not have a positive relationship with IWB and was removed from the model (p > .05). H4, H5, and H6 were supported since idea generation, idea championing, and idea implementation had positive relationships with IWB as shown in Figure 2. The hypotheses for the paths for measuring transformational leadership (H7, H8, H9, and H10) were supported since individualized consideration, intellectual stimulation, inspirational motivation, and idealized influence all had positive relationships with transformational leadership. The hypotheses for the paths measuring transactional leadership (H11, H12, and H13) were supported since contingent reward, management by exception active, and management by exception passive all had positive relationships with transactional leadership. H14 was not supported since the relationship with external locus of control, and innovative work behavior was not significant (β = .044, p > .05). H15 was not supported since the relationship with internal locus of control, and innovative work behavior was not significant (β = .177, p > .05). H16 and H17 for the moderating effects of internal and external locus of control on transformational and transactional leadership were not supported. The moderating effects were not significant (p>.05).

To determine if there was a significant difference in the path coefficients from transational leadership to innovative work behavior and from transformational leadership to innovative work behavior, we used the procedure outlined by Rodriguez-Entrena, Schuberth, and Gelhard (2018). The 95% confidence intervals from bootstrapping with 5,000 subsamples was used to determine whether the zero was covered by the confidence interval. The zero was not covered, indicating that H18 was supported and there was a significant difference in the path coefficient from transactional leadership to innovative work behavior (β = .211) and in the path coefficient from transformational leadership to innovative work behavior (β = .317).

DISCUSSION OF RESULTS

This study provides practical implications for both individuals and organizations. With respect to individuals, results suggest that in work contexts where creativity is highly valued, supervisors may simply like creative followers. They may also devote more attention and invest more time and resources into followers they like, thereby creating facilitating conditions for creativity. With respect to organizations, it appears that leader charisma and contingent rewards have an equally positive influence on the creativity of subordinates. Perhaps leaders can compensate for their lack of charisma in efforts to stimulate creativity among followers through providing timely feedback, clearly articulating performance expectations and rewarding followers when these expectations are met.

Limitations

The data for the present study were collected from a variety of different manufacturing industry sources and not a specific manufacturing field, it has several limitations. The findings reported here need to be replicated using a specific manufacturing field and replicated in other populations. Also, the sample for the current study was drawn from the manufacturing industry and across various manufacturing fields, future research should examine these relationships across contexts varying in complexity and the degree to which innovation and creativity is valued. Finally, the generalizability of results beyond the general manufacturing industry setting is questionable, necessitating testing this study's hypotheses in specific manufacturing fields, organizations, and other industries.

Recommendations for Future Research

Future research should analyze the augmenting impact of transformational leadership on transactional and how this may impact innovative behavior. Bass (1985) examined the relationship between transformational and transactional leadership and discovered the augmenting effects of transformational leadership on transactional leadership. He discovered that transformational leadership augments transactional leadership in predicting the effects on associates' satisfaction and other outcome measures. When used in combination transformational leadership improved on the results of transactional leadership. This augmentation effect is accountable for variances in the ratings of performance that is greater than accounted for by transactional leadership alone (Avolio and Bass, 2004). Waldman, Bass, and Yammarino (1988) confirmed this augmentation effect when outcome was unit performance. In addition, a greater amount of Extra Effort, Effectiveness, and Satisfaction is possible from employees by augmenting transactional with transformational leadership (Avolio and Bass, 2004).

CONCLUSION

In our research, we examined transactional leadership, transformational leadership, external locus of control, internal locus of control, and innovative work behavior. We found that both transactional leadership and transformational leadership were positively related to innovative work behavior. Managers should exhibit transformational leadership styles in the manufacturing environment since transformational leadership was more effective in promoting innovative work behaviors such as idea generation, idea championing, and idea implementation than transactional leadership styles. Internal locus of control and external locus of control were not significantly related to innovative work behavior and did not moderate the relationships between leadership styles and innovative work behavior. The findings of the research are important in the manufacturing environment because managers should develop leadership styles that lead to innovative work behavior to promote sustainability of the organization.

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