The role of transformational leadership in enhancing organizational innovation: Hypotheses and some preliminary findings

Dong I. Jung\textsuperscript{a,*}, Chee Chow\textsuperscript{b,1}, Anne Wu\textsuperscript{c,2}

\textsuperscript{a}Department of Management, San Diego State University, San Diego, CA 92182, USA
\textsuperscript{b}School of Accountancy, San Diego State University, San Diego, CA 92182, USA
\textsuperscript{c}Department of Accounting, National Chengchi University, Wenshan, Taipei, Taiwan

Abstract

A wide range of factors has been found to affect organizational innovation. Of these, top managers’ leadership style has been identified as being one of the most, if not the most, important. Yet, few studies have empirically examined the link between this factor and innovation at the organizational level. This study builds on the extant literature to propose four hypotheses about how top managers’ leadership styles directly and indirectly (via empowerment and organizational climate) affect their companies’ innovation. A multisource approach is used to collect survey data from 32 Taiwanese companies in the electronics/telecommunications industry. The findings support a direct and positive link between a style of leadership that has been labeled as “transformational” and organizational innovation. They also indicate that transformational leadership has significant and positive relations with both empowerment and an innovation-supporting organizational climate. The former is found to have a significant but negative relation with organizational innovation, while the latter has a significant and positive relationship. The implications of the findings and possible directions for future research are discussed.

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1. Introduction

In today’s globalized economic environment, customers’ vastly increased access to information and suppliers has empowered them to demand ever-increasingly arrays of product features, higher quality, better service, and favorable price/cost ratios (Brett & Okumura, 1998; Yukl, 2001). These realities of the marketplace have put tremendous pressures on companies to increase their efficiency and effectiveness and, even more fundamentally, the creativity that they bring to product/process improvements and development (Andriopoulos & Lowe, 2000; Cummings & Oldham, 1997; Tierney, Farmer, & Graen, 1999). This development also has motivated efforts by practitioners and scholars to identify factors that can stimulate creative behaviors in groups and organizations. For example, Amabile (1998) has identified three factors as being important: individuals’ intellectual capacity (creative thinking skills), expertise based on past experience, and a creativity-conducive work environment. Oldham and Cummings (1996) also have identified creativity-relevant personal attributes as well as characteristics of the organizational context like job complexity, supportive supervision, and controlling supervision. Among the factors that influence employees’ creative behaviors and performance, leadership has been identified by many researchers as being one of the most, if not the most, important (Amabile, 1998; Jung, 2001; Mumford & Gustafson, 1988). These scholars suggest that leaders can affect followers’ creativity in both direct and indirect ways. An example of a direct effect is leaders catering to followers’ intrinsic motivation and higher level needs, which are known to be important sources of creativity (Tierney et al., 1999). Indirectly, leaders can support creativity by establishing a work environment that encourages employees to try out different approaches without worrying about being punished just because outcomes are negative (Amabile, Conti, Coon, Lazenby, & Herron, 1996).

While extant research has contributed useful insights into the determinants of employee creative behaviors and performance, its ability to guide practice is limited by the predominance of studies with a focus on the individual employee level. Although understanding individual employees’ creativity and creative work processes is worthwhile, a more important concern for organizations is how to mobilize creativity among employees for the development and production of novel, socially valued products and/or services (Mumford & Gustafson, 1988). Unless the creative behaviors of individual employees can be coordinated and their creative outputs and ideas are harnessed to yield such organizational-level outcomes, the company still would be left without effective responses to the challenges of a competitive marketplace. As for the role of leadership, empirical studies also have tended to examine its effects at the individual level rather than that of the organization. A further limitation on the generalizability and external validity of extant findings is the predominant use of experimental settings and/or subjective measures of creativity (e.g., subjective supervisor ratings).

In view of the current state of the literature, this study explores how leadership affects creativity at the level of the organization. The type of leadership considered in this study is a set of behaviors that has come to be labeled “transformational leadership.” Transformational leadership emphasizes longer-term and vision-based motivational processes (Bass & Avolio, 1997) and has been the subject of extensive research in the past decade. Yet, despite the
potential for a transformational leader to positively impact organizational creativity, little empirical research has investigated the existence and nature of this link (Mumford, Scott, Gaddis, & Strange, 2002). Because leaders define the context in which their followers interact and work toward a common goal, we believe that previous findings of a positive link between transformational leadership and individual creativity can be extrapolated to an organizational level. Ultimately, this is an empirical question, and we provide some preliminary findings bearing on the efficacy of our expectation.

The remainder of this article is organized as follows. The next section provides an overview of the relevant literature as the basis for specifying four hypotheses. Then, the method is discussed followed by presentation of the findings. The final section provides a summary and discusses implications for future research.

2. Theoretical background and hypotheses

2.1. The role of leadership in creativity and organizational innovation

Research on the determinants of creativity has identified a wide set of factors. These range from ones at the level of the individual, such as personality, technical knowledge, expertise, motives, and the supervisor’s feedback style, to ones at the group level, such as task structure, communication types, and task autonomy, to organizational level factors, such as strategy, organizational structure, culture and climate, and available resources. Damanpour (1991) and Mumford et al. (2002) provide metaanalytic summaries and comprehensive discussions on these issues. While each of these identified factors undoubtedly is relevant, the increasing complexity of work processes and the evermore competitive business environment have created new challenges for organizations, and their top managers’ style of leadership has accordingly become an increasingly important determinant of organizational creativity (Dess & Picken, 2000).

Conceptually, the top managers of an organization can affect employee creativity and organizational innovation in several different ways. First, they define and shape the work contexts within which employees interact to define goals, problems, and solutions (Amabile, 1998; Redmond, Mumford, & Teach, 1993). By articulating a vision that emphasizes long-term over short-term business outcomes (e.g., growth and value rather than quarterly profit), leaders can direct employees’ individual and joint efforts towards innovative work processes and outcomes (Amabile, 1996). More broadly, organizational leaders are a key source of influence on organizational culture (Schein, 1992). By creating and sustaining an organizational climate and culture that nurtures creative efforts and facilitates diffusion of learning, leaders can significantly boost organizational creativity (Yukl, 2001). Finally, leaders can develop and maintain a system that values and rewards creative performance through compensation and other human resource-related policies. When a company provides intrinsic and extrinsic rewards for efforts to acquire new skills and to experiment with creative work approaches, employees’ desire to engage in creative endeavors will be constantly reinforced (Jung, 2001; Mumford & Gustafson, 1988).
2.2. Transformational leadership and organizational innovation

Over the years, a number of research findings have been reported on the relationship between particular leader behaviors and/or leadership styles and creativity in organizations (e.g., creative works, ideas, and performance; see Mumford et al., 2002 for a comprehensive literature review on leadership and creativity). For example, Hage and Dewar (1973) and Maier (1970) found positive associations between democratic, considerate, and participative leader behaviors and subordinates’ creativity. Redmond et al. (1993) found that, when leaders supported constructive problem solving and followers’ self-efficacy, followers displayed higher levels of creativity. In a similar vein, Scott and Bruce (1994) found that the role expectations of a supervisor had a positive influence on subordinates’ innovative behavior. Tierney et al. (1999) focused on the quality of leader–follower relationship based on leader–member exchange theory and found that it was positively related to employee creative performance. Oldham and Cummings (1996) also found that employees produced more creative work when they were supervised in a supportive, noncontrolling manner.

Although these studies have produced valuable insights, a particularly promising direction for studying leadership and creativity seems to be the effects of transformational leadership. The concept of transformational leadership has gained wide popularity among leadership researchers during the past decade (Lowe, Kroeck, & Sivasubramaniam, 1996) because of its qualitatively different approach to motivating followers as compared with other leadership styles (Gardner & Avolio, 1998; Howell & Avolio, 1993; Yammarino, Spangler, & Bass, 1993). Bass and Avolio (1994) characterized transformational leadership as being composed of four unique but interrelated behavioral components: inspirational motivation (articulating an appealing and/or evocative vision), intellectual stimulation (promoting creativity and innovation), idealized influence (charismatic role modeling), and individualized consideration (coaching and mentoring). Several empirical and theoretical studies have found that leaders who display these four behaviors are able to realign their followers’ values and norms, promote both personal and organizational changes, and help followers to exceed their initial performance expectations (e.g., House & Shamir, 1993; Jung & Avolio, 2000).

Several reasons support the expectation that transformational leadership would enhance employee creativity and innovation. First, transformational leaders go beyond exchanging contractual agreements for desired performance by actively engaging followers’ personal value systems (Bass, 1985; Gardner & Avolio, 1998; Shamir, House, & Arthur, 1993). They provide ideological explanations that link followers’ identities to the collective identity of their organization, thereby increasing followers’ intrinsic motivation (rather than just providing extrinsic motivation) to perform their job. By articulating an important vision and mission for the organization, transformational leaders increase followers’ understanding of the importance and values associated with desired outcomes, raise their performance expectations, and increase their willingness to transcend their self-interests for the sake of the collective entity (Bennis & Nanus, 1985; Conger & Kanungo, 1998; House, Spangler, & Woycke, 1991). A number of studies have found that intrinsic motivation leads to creativity because intrinsically motivated
people tend to prefer novel approaches to problem solving (Amabile, Hill, Hennessey, & Tighe, 1994; Zhou, 1998). Followers’ identification with the organization’s vision, mission, and culture also has been linked to heightened levels of motivation toward higher levels of performance (Shamir et al., 1993).

Second, by providing intellectual stimulation (Bass & Avolio, 1997), transformational leaders encourage followers to think “out of the box” and to adopt generative and exploratory thinking processes (Sosik, Avolio, & Kahai, 1997). Transformational leaders stimulate their followers to think about old problems in new ways and encourage them to challenge their own values, traditions, and beliefs (Hater & Bass, 1988). Oftentimes, transformational leaders are able to accomplish this shift in perspective by serving as role models. By showing high expectations and confidence in followers’ capabilities, transformational leaders also help to develop followers’ commitment to long-term goals, missions, and vision and to shift their focus from short-term and immediate solutions and objectives to long-term and fundamental solutions and objectives. Indeed, in a study of Austrian branch bank managers, Geyer and Steyrer (1998) reported a stronger positive relationship between these managers’ extent of transformational leadership and long-term as compared with short-term performance. Because creativity in organizations often requires trade-offs across time, this finding provides a basis for expecting that transformational leadership would enhance creativity.

Several studies have examined this relationship more directly and found positive results. Sosik, Kahai, and Avolio (1998) found that transformational leadership increased followers’ creativity in a computer-mediated brainstorming exercise. In this study, the followers’ performance was assessed in part based on the number of creative ideas generated. In a study of 78 managers, Howell and Avolio (1993) found a positive relationship between the intellectual stimulation provided by the leader and unit performance when there was a climate of support for innovation within the leader’s unit. However, when support for innovation was absent, the positive relationship became insignificant. This pair of findings provides indirect support for the leader’s role in inducing creativity. Keller (1992) also found that transformational leadership positively influenced performance of research and development (R&D) project teams in a large R&D organization. Performance was measured based on superiors’ ratings of subordinate innovativeness and the extent to which their innovative orientation added unique value to the projects that they finished.

Taken as a whole, these prior studies have provided a strong theoretical basis for expecting that transformational leadership would enhance creativity among followers. However, as can be inferred from our summaries of prior empirical research, these have tended to focus on the role of leadership at the individual level and mainly with subjective performance measures such as self-reported and supervisory ratings of creativity. Mumford et al. (2002) have argued that the use of a vision-based motivational process by transformational leaders should enhance creativity at the organizational level. This is because “by framing vision in terms of work goals and articulating this vision through project selection and project evaluation rather than overt affective appeals, a work-focused vision or mission may be promulgated that will enhance people’s creative efforts” (p. 12). Amabile (1998) also has suggested that by influencing the nature of the work environment and organizational culture, leaders can affect
organizational members’ work attitudes and motivation in their interactions, thereby affecting their collective organizational achievement.

Despite the reasonableness of expecting that transformational leadership would enhance organizational innovation, little empirical research has investigated the existence and nature of this link (Mumford et al., 2002). We share this expectation and specify the following hypothesis to focus our empirical investigation:

**Hypothesis 1:** Transformational leadership is positively related to organizational innovation.

### 2.3. Transformational leadership, empowerment, support for innovation, and organizational innovation

#### 2.3.1. Transformational leadership and empowerment

While transformational leaders may sometimes take a directive approach, they often seek followers’ participation by highlighting the importance of cooperation in performing collective tasks, providing the opportunity to learn from shared experience, and delegating to followers the authority to execute any necessary action for effective performance (Bass, 1985). Through such means, transformational leaders create a work environment where followers feel empowered to seek innovative approaches to perform their job. Avolio and Gibson (1988) have gone so far as to argue that a major goal of transformational leaders is to develop followers’ self-management and self-development skills by allowing them to make and implement actions without direct supervision or intervention.

According to Amabile et al. (1996), autonomy or freedom is an important determinant of organizational creativity because individuals produce more creative work when they perceive more personal control over how to accomplish given tasks. People who are empowered also are more likely to be intrinsically motivated, which in turn promotes creative endeavors (Jung & Sosik, 2002). Consistent with this view, a field experiment with over 800 Israeli soldiers by Dvir, Eden, Avolio, and Shamir (2002) has found that followers with a transformational leader were more self-confident and took more critical and independent approaches toward their work than followers in a control group. Zhou (1998) also found that individuals generated the most creative ideas when they worked in a high task autonomy work environment. Conversely, Damanpour (1991) has found a negative relationship between centralization and organizational innovation, where centralization was defined as the concentration of decision-making authority in the hands of higher management and may be seen as an opposite construct to autonomy and empowerment.

#### 2.3.2. Transformational leadership and support for innovation

Mumford and Gustafson (1988, p. 37) have argued that organizational innovation also depends on whether the organization has a climate that supports innovation: “(E)ven when individuals have developed the capacity for innovation, their willingness to undertake productive efforts may be conditioned by beliefs concerning the consequences of such actions in a given environment.” When an organization’s culture emphasizes reliable and efficient operations without making any mistakes or is not highly concerned with
innovation, employees will be discouraged from taking initiative in their work even if they are given autonomy (Yukl, 2001). In part, this is due to employees fearing potentially negative consequences associated with risky decisions. However, when an organizational culture values initiative and innovative approaches, employees are more likely to take calculated risks, accept challenging assignments, and derive intrinsic enjoyment from their work.

According to Mumford et al. (2002), organizational climate and culture represent collective social construction, over which leaders have substantial control and influence. Jung (2001) also views managers as playing key roles in developing, transforming, and institutionalizing organizational culture. Along the same vein, Schein (1992) argues that as organizational founders and leaders communicate what they believe to be right and wrong, these personal beliefs become part of the organization’s climate and culture. As was discussed earlier, one defining characteristic of a transformational leader is the ability to arouse and change followers’ propensity for longer-term and more creative perspectives (Bass & Avolio, 1997). When a transformational leader stimulates followers’ efforts to be innovative and creative by questioning their assumptions, reframing problems, and approaching old situations in new ways, he/she helps to establish an organizational culture among employees that values creative thought processes, risk-taking approaches, and innovative work approaches. Once this organizational climate is established, it serves as a sense-making device and guiding principle for more creative work processes that could ultimately lead to innovative products and services (Scott & Bruce, 1994).

Several empirical studies have provided evidence that an organization’s or group’s climate for innovation is an important determinant of innovation. For example, Bain, Mann, and Pirola-Merlo (2001) studied a group of research scientists and technologists in four Australian companies with substantial R&D operations. They found a positive relationship between a team’s climate for innovation and six indicators of innovation (e.g., number of patents and supervisory ratings). At the organizational level, Scott and Bruce (1994) found that a climate that strongly supported innovation increased innovative behavior among research scientists and engineers in a large U.S. company’s R&D center. They also found a positive and significant association between leader–member exchange and support for innovation, which in turn was positively related to innovative behavior among employees.

In summary, there is substantial theoretical support for expecting that leaders play a major role in establishing an innovative organizational culture and facilitating creativity in organizations. In addition, the role of creativity and innovation in determining organizational performance has been well established. However, as Mumford et al. (2002) have observed, conspicuously absent from the literature are empirical studies on the link between leadership and innovation at the organizational level while incorporating contextual variables. Considering that researchers have emphasized the transformational leader’s role in creating an intellectually stimulating work environment, it is surprising to find that no study has yet examined how a transformational leadership style affects innovative organizational climate and how it further affects creativity and organizational innovation. The prior literature provides the basis for expecting specific relationships among transformational leadership, empower-
ment, support for innovation as an organizational climate, and organizational innovation. We specify these expectations as the basis for focusing our empirical investigation:

**Hypothesis 2:** Transformational leadership is positively related to employees’ perceptions of (a) empowerment and (b) support for innovation.

**Hypothesis 3:** Employees’ perceptions of (a) empowerment and (b) support for innovation have a positive relationship with organizational innovation.

As we also had noted earlier, not only can transformational leadership directly affect organizational innovation, but the relationship also could be moderated by followers’ perceptions about the extent of empowerment and the support for innovation in the organizational climate. Thus:

**Hypothesis 4:** Employees’ perceptions of (a) empowerment and (b) support for innovation moderate the relationship between transformational leadership and organizational innovation such that the relationship will be stronger when perceived empowerment/support for innovation is high rather than low.

Our theoretical model depicting the nomological networks among all of our hypotheses is summarized and shown in Fig. 1.

3. Method

3.1. Sample and procedures

Thirty-two Taiwanese companies participated in the present study. To eliminate common response biases, three senior managers were randomly chosen from each company to complete different survey instruments (A, B, and C). The manager who completed Survey A had to be one who regularly interacted with the CEO/President of the firm. The questions in the survey measured his/her CEO’s (President’s) transformational leadership behaviors. A second manager was given Survey B, which measured empowerment and organizational
climate for innovation in the company. Finally, the third manager was given Survey C about his/her firm’s innovation performance. More detailed information on these survey instruments is provided in the following section.

All 32 participating companies were selected from the electronics and telecommunications industry to limit potential variation due to different industry types. We chose this industry for study because product development through organizational innovation has been a critical factor for company survival due to the industry’s rapid technological advances and highly competitive markets (Carey & Nahavandi, 1996).

Based on the responses to Survey A, the 32 companies had been in existence for around 17.2 years on average ($SD = 7.6$ years). This suggested that they are fully established with a stable executive leadership structure in place. The average length of time that the CEOs/Presidents from these companies had been in their current position was about 9.7 years ($SD = 5.7$ years). In terms of size, only three of the companies had fewer than 100 full-time equivalent (FTE) employees while nine had between 101 and 500 FTE employees. All of the remaining 20 companies had at least 500 full-time employees.

The majority of Survey A participants (about 51%) was between 40 and 50 years old and only one was female. On average, they had been working for their company for 8.3 years and for the current CEO/President for 5.8 years. The vast majority (94%) had a college degree or above. Fifty-nine percent identified themselves as members of top management, and their average tenure in their current job was about 4.2 years.

The 32 participants who completed Survey B had similar demographic profiles. For example, only four were younger than 40 years old and two were female. The mean number of years of stay with their organizations and current positions were 8.6 and 3.9 years, respectively. Thirty-one of these participants had a college degree or above and 72% of them (23 out of 32) indicated that their current organizational rank was top management.

The managers who responded to Survey C were slightly less senior than the other two groups. For example, 16 (50%) were between 30 and 40 years old, with mean lengths of organizational and positional tenure of 6.7 and 3.3 years, respectively. Only six indicated their current ranks as being top management, with the rest considering themselves to be at the middle management rank. Nevertheless, all of them were highly educated (all had college or above levels of education). There was only one female in this group.

Due to the sensitive nature of many questions (e.g., their CEO’s/President’s leadership, organizational climate, and organizational innovation performance), all respondents were guaranteed confidentiality and anonymity. A postage-paid, self-addressed envelope was provided so that they could mail their surveys back to the researchers directly. (The instrument contained a company identification code so that the three surveys from each company could be grouped for analysis. This purpose was made known to the respondents.)

3.2. Measures

Transformational leadership was measured using a 20-item scale from the Multifactor Leadership Questionnaire (MLQ) developed by Bass and Avolio (1997). The MLQ has been
extensively used and is considered a well-validated measure of transformational leadership (Awamleh & Gardner, 1999). Its construct validity has recently been demonstrated using Confirmatory Factor Analysis (cf. Avolio, Bass, & Jung, 1999).

All four theoretically distinctive behavioral components of transformational leadership were operationalized in the MLQ. A sample item measuring the leader’s position as role model (idealized influence) was “My team leader goes beyond self-interest for the good of the group.” The transformational leader’s inspirational motivation role was gauged with items like “My team leader talks optimistically about the future.” An item relating to the intellectual stimulation role was “My team leader got me to look at the task from many different angles.” Finally, items like “My team leader helps team members to develop their strengths” were used to tap the individualized consideration aspect of transformational leadership. All items were rated on a 5-point scale with 1 = strongly disagree and 5 = strongly agree.

Empowerment was measured using a 12-item scale developed by Spreitzer (1995). This scale measures followers’ perception of empowerment based on the dimensions of meaningfulness, competence, self-determination, and impact (sample item: “I have significant autonomy in determining how I do my job”). All items were rated using a 7-point scale ranging from 1 (very strongly disagree) to 7 (very strongly agree).

Support for innovation was measured using a 22-item scale containing two subscales (support for creativity and tolerance of differences). It was originally developed by Siegel and Kaemmerer (1978) and later modified by Scott and Bruce (1994). All items were rated on a 7-point scale ranging from 1 (very strongly disagree) to 7 (very strongly agree).

Organizational innovation was measured with three different proxies. We followed Woodman, Sawyer, and Griffin (1993) in viewing organizational innovation as “the creation of a valuable, useful new product, service idea, procedure, or process by individuals working together in a complex social system” (p. 293). Therefore, we conducted an extensive literature review to identify multifaceted measures of organizational innovation. Based on this review, we included a measure of R&D intensity (the total amount that each company had spent on R&D over the past 3 years), which Hitt, Hoskisson, and Kim (1997) have maintained to be a proxy for firm innovation. The second proxy that we used was annual R&D expenditures as a percentage of gross revenues over the past 3 years. Finally, the number of patents that a company obtains represents a tangible outcome of an organization’s effort for innovation and has been commonly used by past research as a measure of creative performance (Oldham & Cummings, 1996). Therefore, we also asked for the average number of patents that the company had obtained annually over the past 3 years.

3.2.1. Control variables

Past research has identified several demographic variables, such as an individual’s age, education, and organizational tenure, as potential influences on employees’ innovative behavior and performance (Mumford et al., 2002). Because our study focused on the level of the organization rather than individuals, we measured each company’s age and size (number of full-time employees). These two company attributes were used as control variables because prior studies have documented their positive relations with organizational innovation (Hitt et al., 1997). Because all of the companies in our sample had come from
the same industry, there was no need to control for industry type although this variable has been shown to influence the degree to which organizations emphasize innovation (Hitt et al., 1997).

Finally, because we collected data from Taiwanese companies in Taiwan, we followed Brislin’s (1986) recommendation of translation and back-translation. First, all three surveys were translated into Chinese by a bilingual individual who was not told the objective of the study. Another bilingual person then back-translated the Chinese versions into English without having access to the original instruments. The two English versions were carefully compared and a few minor changes were made to the Chinese version to ensure conceptual equivalence to the English original (Brislin, 1986).

3.3. Data analysis

The hypotheses were tested using the partial least squares structural equation modeling technique (PLS) (Wold, 1985). PLS is increasingly being adopted by group researchers (see Sambamurthy & Chin, 1994; Sosik et al., 1997 for detailed information on PLS) because it does not require a large sample for data analysis. This is a major advantage because in studying issues at the organizational level, it is extremely difficult to obtain a large sample. In addition, PLS does not make assumptions about (a) data distributions to estimate model parameters, (b) observation independence, or (c) variable metrics. This feature makes it more suitable than other techniques like multiple regression and LISREL, which require multivariate normality, interval scaled data, and large sample sizes.

PLS generates estimates of standardized regression coefficients (i.e., path coefficients) for the model paths, which can then be used to measure the relationships between latent variables. A jackknifing procedure called blindfolding with an omission distance of 10 was used to evaluate the statistical significance of the path coefficients (Sambamurthy & Chin, 1994). The blindfolding procedure omits a part of the data matrix for a particular variable and then estimates model parameters (e.g., path coefficients) associated with that variable.

4. Results

4.1. Measurement component

We first ran a preliminary PLS analysis with all of the survey items to test the scales’ psychometric properties. Three criteria were used to determine whether any item indicator should be retained. First, the factor loadings of indicators associated with each construct had to be 0.60 or above to ensure adequate reliability (Bagozzi & Youjae, 1988). Second, the composite scale reliability for each construct (an internal consistency estimate similar to α) had to exceed the recommended cutoff of 0.70. Finally, the average variance extracted by the preceding latent constructs from their indicators had to exceed the recommended cutoff of 0.50 (Fornell & Larcker, 1981).
Application of these criteria led us to retain 18 items for transformational leadership, 5 items for empowerment, and 9 items for support for innovation. One indicator (absolute R&D expenditure) failed to achieve a factor loading of 0.60. However, it still was kept because it represented an important aspect of innovation efforts made by the companies (Hitt et al., 1997). Table 1 shows descriptive statistics and intercorrelations among the scales. Table 2 summarizes factor loadings of retained indicators, composite scale reliabilities, and average variance extracted. All of the measures had adequate reliability. Intercorrelations also showed generally positive relationships.

4.2. Structural component

Results of the PLS analysis are shown in Fig. 2. These results are based on a model that included company age and size as covariates. Both company age ($\beta = 0.11, p < .001$) and size ($\beta = 0.65, p < .001$) were positively related to organizational innovation, which is consistent with prior findings from the organizational innovation literature (Hitt et al., 1997).

4.2.1. Direct effects

Considering the small sample size of 32 companies, we used a relatively lenient criterion of 10% for statistical significance in the current study. Consistent with Hypothesis 1,
transformational leadership was significantly and positively related to organizational innovation ($\beta = 0.04, p < .10$). Transformational leadership also was significantly and positively related to empowerment ($\beta = 0.11, p < .001$) and support for innovation ($\beta = 0.58, p < .001$), thus supporting Hypotheses 2a and 2b. Hypothesis 3 was only partially supported. While

### Table 2
Factor loadings, weights, composite scale reliability, and average variance extracted to assess reliability of constructs ($n = 32$ companies)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measurea</th>
<th>Factor loading</th>
<th>Weights of measures</th>
<th>Composite scale reliability</th>
<th>Average variance extracted</th>
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<tr>
<td>1. Transformational leadership</td>
<td>II1</td>
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<td></td>
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<td>IM1</td>
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<td>IM2</td>
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<td>2. Empowerment</td>
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<td>0.89</td>
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<td>0.89</td>
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<td>0.83</td>
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<td>3. Support for innovation</td>
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<td>0.21</td>
<td>0.91</td>
<td>0.54</td>
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<td>Item 9</td>
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<td>0.17</td>
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<td>4. Organizational innovation</td>
<td>R&amp;D (NT$)</td>
<td>0.48</td>
<td>0.23</td>
<td>0.66</td>
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<tr>
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<td>R&amp;D (%)</td>
<td>0.90</td>
<td>0.54</td>
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<tr>
<td></td>
<td>Number of patents</td>
<td>0.87</td>
<td>0.47</td>
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</table>

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*a CH = Charisma; II = Idealized influence; IM = Inspirational motivation; IS = Intellectual stimulation; IC = Individualized consideration.*

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empowerment (Hypothesis 3a: $\beta = -0.20$, $p < .001$) was significantly related to organizational innovation, the relationship was negative rather than positive. On the other hand, support for innovation (Hypothesis 3b: $\beta = 0.37$, $p < .001$) was, as predicted, significantly and positively related to organizational innovation.

4.2.2. Moderating effects

We tested the moderating effects of empowerment and support for innovation (Hypotheses 4a and 4b) by creating two subgroups ($n=16$ companies in each group) based on median splits of empowerment and support for innovation, respectively, and rerunning the same PLS analysis. Then, we compared the path coefficients from transformational leadership with organizational innovation. As expected, the path coefficient was higher in the high empowerment group ($\beta = 0.11$) than in the low empowerment group ($\beta = 0.04$). However, although the difference was in the expected direction, it was not statistically significant in unpaired $t$ tests. In the case of support for innovation, the path coefficient was higher in the high-support group ($\beta = 0.10$) than in the low-support group ($\beta = 0.02$). The difference was statistically significant [$t(32) = 1.75$, $p < .05$].

5. Discussion and conclusions

Prior research has suggested that top managers’ leadership styles can significantly impact an organization’s creativity and innovative ability. A major avenue whereby this positive impact arises is held to be the establishment of an organizational climate that empowers employees and provides support for innovation. We have integrated extant discussions of leadership to propose four sets of hypotheses about how transformational leadership shown by top executives directly and indirectly affects innovation at the collective level of the organization. We also have provided preliminary research findings on the efficacy of these hypotheses.

Findings based on 32 Taiwanese companies provide support for our expectation that a direct and positive relationship exists between transformational leadership and organizational innovation. We also find positive and significant relationships between transformational leadership and empowerment as well as support for innovation and a positive relationship
between support for innovation and organizational innovation. These results support our proposition that transformational leadership by the top manager can enhance organizational innovation directly and also indirectly by creating an organizational culture in which employees are encouraged to freely discuss and try out innovative ideas and approaches. While our study did not examine how specific transformational behaviors affected organizational innovation, certain types of transformational leadership behaviors (e.g., inspiration motivation or intellectual motivation) have been specifically identified by several researchers as being positively related to creativity (e.g., Sosik et al., 1997). For example, organizations such as 3M and Qualcomm have been singled out as ones in which employees are constantly challenged to be creative, and it is held that this approach has enabled them to achieve many innovative and successful business outcomes, including superior technologies and more advanced products than those of competitors (Sosik, Jung, Berson, Dionne, & Jaussi, in press). Because many aspects of leadership behavior can be learned or modified, our findings suggest that organizations can improve their innovativeness by helping managers to develop and display transformational leadership behaviors through training and mentoring processes.

We also found that the link between empowerment and organizational innovation was negative rather than positive. This finding implies that companies, which delegate more autonomy to employees, are less rather than more innovative. Two factors may help to explain this unexpected finding in the context of our study. First is that all of our sample companies had come from Taiwan, where cultural values are relatively high in power distance (Hofstede, 1997). Within this type of culture, employees tend to prefer having top managers take more control of the work process and to lead by example (Chow, Shields, & Wu, 1999). As such, employees with a high power distance cultural disposition may feel confused when left alone to figure out what they need to do and how to accomplish their goals. Because undertaking innovative approaches to work typically requires making risky decisions, empowerment per se, if not accompanied by guidance and some measure of structure, could lead to negative consequences in a high power distance culture.

Second, and not totally independent of the possible role of power distance, our finding may underline a general need for transformational leaders to maintain a balance between letting people feel empowered and providing guidance via defining goals and agenda. Creative work processes often involve a complicated process of pulling available resources together to recognize current market trends, focus on the core message and strategy, and develop people in line with the strategy (Schein, 1992). Unless the leader plays an active role in providing guidance, coordinating and supporting these activities, employees or organizational units might wind up working at cross-purposes. Indeed, several studies have found a positive relationship between leaders’ initiation of work structure and performance of creative activities (i.e., Keller, 1992). At the same time, the importance of allowing room for individual experimentation and initiative is emphasized by Mumford et al. (2002), who state that “...planning by leaders should not focus on the conduct of a specific piece of work. Rather, leaders’ planning should focus on progress, the general types of projects that should be pursued, and the consequences of pursuing project results into development” (p. 716). Future research could fruitfully explore whether our finding on the link between empowerment and organizational innovation would differ in a low power distance culture and whether
there is an effect due to the balance between empowerment and specificity of guidance provided by the top manager.

Although we have found several encouraging results, it is important to recognize that the current findings also have several limitations. These limitations caution against immediate acceptance of the findings as a guide to action and present opportunities for replication and validation in future research. First, it is desirable to expand the size of the sample. Although we were able to use PLS to accommodate our relatively small sample size (e.g., see House et al., 1991), using data from a larger number of companies will permit more powerful hypothesis tests. For example, we surmise that the lack of statistical significance for our tests of moderating effects may be an artifact of our small sample size. Obtaining a larger sample will help to assess the validity of this conjecture. In addition, having only one respondent for each variable did not allow us to test within-group agreement. This could be an important issue because the extant leadership literature has indicated that different followers/employees may have different perceptions about their superior’s leadership style and organizational culture (Klein & House, 1995). One direction in which we are currently extending this study is collecting data from multiple raters on the measured variables to address the issue of within-organization agreement.

Second, all of our sample companies had come from one industry (electronics/telecommunications). Although this sample helped to control for industry effects, it also precluded discovery of factors and relationships that may differ across industries. For example, companies from different industries may face different degrees of environmental and technological uncertainty, which may affect the relative importance of efficiency versus innovation and, accordingly, the companies’ competitive priorities and foci.

Third, our study has only examined the role of transformational leadership in establishing/maintaining a creativity-inducing work environment (e.g., empowerment and support for innovation). Yet, the behaviors of organizational members occur in a far more complex environment involving many additional factors. Besides being guided and motivated by the leader’s behavior and organizational culture, employees’ behaviors also are a function of the performance measurement and reward system (e.g., whether performance is individual based or team based, the use of short-term vs. long-term performance measures, the mix of financial and nonfinancial measures, and the extent of performance-based rewards). Employees’ willingness to experiment and take risks also may depend on the tightness of the resource and time constraints that they face at work. In turn, these aspects of the work environment may be affected by the extent to which superiors permit subordinate participation in establishing budgets and performance standards and in the latter’s performance evaluation.

Fourth, attention should be devoted to expanding and refining measurement of the dependent variable. While the three proxies that we used have precedents in the literature, they seem far short of fully operationalizing the organizational innovation construct. In particular, it might be argued that R&D expenditures more appropriately reflect an organization’s willingness to support innovative efforts than its success in generating outcomes. While the number of patents successfully obtained probably does reflect innovation success, many organizational innovations may not be of the type that lends itself to patent applications. This may be particularly true, for example, with improvements in services and
work processes, time-to-market of new products, or ways of measuring and rewarding performance.

Finally, this study has focused on the organization as a whole, although we believe that a similar mode of reasoning should apply at the level of organizational subunits. The leader of each organizational subunit typically has some control over his/her unit’s operations, and it is reasonable that his/her leadership behaviors should impact the motivations and work processes of subordinates and, through that, the unit’s innovation performance. As with our extending the prior literature from the individual to the organizational level, whether such an expectation is valid is an empirical question. Future studies can fruitfully examine this issue based on a cross-level analysis that encompasses leadership styles, followers’ personal and motivational characteristics, group norms, and various organizational and environmental characteristics as discussed above.

These limitations notwithstanding, we believe that the present study has made a meaningful contribution to the current literature. While empirical research has examined many determinants of creativity and innovation, leadership has been relatively understudied despite its wide acceptance among leadership scholars as being a key contributor to creative performance in organizations (Mumford et al., 2002). As Dess and Picken (2000) have emphasized, the 21st century business environment will require organizations to continuously innovate by harnessing the collective knowledge, skills, and creative efforts of their employees. Transformational leadership can be an effective part of the response, and to our knowledge, our study is the first one to have examined how transformational leadership is associated with innovative organizational climate and firm innovation from a macrolevel perspective and with multisource data collection.

6. Uncited reference

Osborn et al., 2002

References


