The Relationship between Use of Humor by Leaders and R&D Employee Innovative Behavior: Evidence from Taiwan

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Abstract

Leadership has been found to affect individual and organizational innovation. Use of humor is a characteristic of leadership, and has been identified as a moderator of leadership style and individual or unit-level performance. Yet, the link between use of humor by leaders and employee innovative behavior has not been examined. This study examines the relationships between use of humor by leaders, employee communication, group cohesiveness, and employee innovative behavior, using a survey of 239 employees of R&D departments in 31 of Taiwan’s manufacturing firms. Results indicate that the use of humor by leaders made a significant positive contribution to employee innovative behavior. These relationships were mediated by both employee communication and group cohesiveness. Research and managerial implications are also discussed.

Keywords: Use of humor, innovative behavior, employee communication, group cohesiveness

1. Introduction

In today’s fast changing business environment, innovation is being recognized as the difference between surviving and not surviving. Nystrom (1990) has provided evidence indicating that organizational profit and growth may be related to innovation, since innovation is a strategic approach for improving the organization and making it more competitive.

Given this understanding, over the last two decades growing importance has been placed on research in organizational innovation. As organizational innovation has become more critical, a topic of increasing importance to organizational leaders is enhancing the ability of employees to innovate (Bolwijn and Kumpe, 1990). Innovative behavior plays a central role in employee ability to innovate, because it captures employee behavior intended to achieve the production of novel products, service and/or work processes. In addition, leadership has been identified by many researchers as being one of the important factors that affects employee innovative behavior and performance (Amabile, 1998; Jung, 2001; Mumford and Gustafson, 1988). For example, previous research has found that employee perceptions of the work environment were affected by their team leaders and were also related to their creativity (Oldham and Cummings, 1996; Scott and Bruce, 1994).

Some empirical evidence suggests that there is a relatively strong link between humor and creativity. For example, Csikszentmihalyi (1996) and Murdock and Ganim (1993) have found that the use of humor in organizations has been associated with stimulating individual and group creativity by motivating divergent, creative, and innovative thinking. Dixon (1980) pointed out that leaders who use humor may find innovative solutions, making them more

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productive. A sense of humor is a characteristic or trait associated with leadership (Bass, 1990; Shamir, 1995) and often goes along with a leader’s ability to create behavioral change in followers (Hogan et al., 1994). The important role of humor in organizations has been identified in previous studies (Duncan, 1982; Malone, 1980), but research into the relationship between the use of humor by leaders and organizational innovation is limited. In particular, studies that explore how the use of humor by leaders affects employee innovative behavior are lacking. Romero and Cruthirds (2006) have described how managers can use humor to enhance leadership, group cohesiveness, communication, and creativity. However, relative little empirical research has examined the relationship between use of humor by leaders, group cohesiveness, communication, and employee innovative behavior. Consequently, this study investigates two questions that have not yet been examined in the literature: whether the use of humor by leaders positively affects employee innovative behavior; and the role of employee communication and group cohesiveness in the relationship between the use of humor by leaders and innovative behavior. To address these questions, an exploratory study examining how the use of humor by leaders is related to employee innovative behavior was conducted. The study also explored whether both employee communication and group cohesiveness are mediators between the use of humor by leaders and employee innovative behavior.

2. Theoretical background and hypotheses

In discussions of work environment as an important influence on employee creativity, there were three major theories of organizational creativity: the componential theory (Amabile, 1988, 1997), the interactionist theory (Woodman et al., 1993), and the multiple social domains theory (Ford, 1996). The componential theory was one of the first to comprehensively take into account the work environment (or social environment) on creative process. Besides, the componential theory also proposes that both instrumental and socio-emotional leader support behaviors contribute to the perceived work environment for creativity (Amabile et al., 2004). The componential theory then argues that specific leader behaviors of supervisors can enhance or support employee creativity. This theory provides the conceptual foundation for this study.

Leadership is usually considered a social influence process (Fisher, 1985). There are several theoretical perspectives that attempt to explain leadership including: trait, style, situational or contingency, power, and functional perspectives (Brilhart and Galanes, 1989; Daniels and Spiker, 1987; Fisher, 1980; Hoy and Miskel, 1991; Jensen and Chilberg, 1991). The contingency approach and the functional perspective (Jensen and Chilberg, 1991; Schultz, 1989) of leadership, focuses on leadership behaviors that are performed, rather than on describing the traits or styles of leaders. Using a functional perspective, there are two primary dimensions of leadership behavior, the task dimension and the social dimension (Fisher, 1980; Hoy and Miskel, 1991). Because leadership communication behavior can be categorized into the social dimension, the functional view has been applied to the use of humor as a form of communication (Graham et al., 1992).

In the theory of charismatic leadership, House (1976) suggested that charismatic leaders act in distinctive ways that have specific charismatic effects on their followers. In addition, Shamir (1995) identified two forms of charismatic leadership, namely close charismatic leadership, and distant charismatic leadership. Close charismatic leaders are more frequently described as having interpersonal skills and behaviors, such as sensitivity to follower needs, and supportive behaviors. A sense of humor is one of the traits that appears often in descriptions of close charismatic leaders. Further, Bass (1990) cited several early studies reporting substantial correlations between leadership and sense of humor. Although Shamir
(1995) has suggested that a sense of humor is a critical trait of leaders, others have emphasized the functional role of humor. For example, Brilhart and Galanes (1989) pointed out the importance of humor as a leadership function to help reduce tensions among group members. Clearly, humor could be seeing as an important role of leadership for leaders.

2.1 Use of humor by leaders and employee innovative behavior

Humor has been identified as an effective management tool. Avolio et al. (1999) argued that the leadership style is moderated by the use of humor and relationship with individual and unit-level performance. Some empirical evidence suggests that there is a relatively strong link between humor and creativity. For example, Csikszentmihalyi (1996) and Murdock and Ganim (1993) have found that the use of humor in organizations has been associated with stimulating individual and group creativity by motivating divergent, creative, and innovative thinking. Dixon (1980) pointed out that leaders who use humor may find innovative solutions, making them more productive. Moreover, it is possible that leaders who use humor will also influence their followers to find novel solutions as well as attain higher levels of productivity (Romero and Pearson, 2004).

Humor helps openness to new ideas by moderating people and making them less likely to find fault with mistakes or new ideas (Romero and Cruthirds, 2006). This function leads to risk taking, which promotes creative thinking (Morreall, 1991). Lower levels of criticism lead to a more harmonious environment providing people the opportunity to act on creative thinking and implement new ideas more freely (Romero and Cruthirds, 2006). Isen et al., (1987) also found that in a humorous environment individuals are more likely to engage in creative problem solving.

How does humor support creative thinking? Evidence shows that humor fosters creativity by offering practice at gaining new perspectives on problems. In other words, creativity can increase when people are exposed to a humorous atmosphere (Ziv, 1989). For example, simply listening to a humorous recording increase scores on a subsequent creativity test (Ziv, 1976). People also perform more creatively on a task when it is designed as “play” than when it is designed as “work” (Glynn, 1988). De Bono (1970) stated that “lateral thinking is closely related to insight, creativity, and humor”. Ziv (1984) suggested that humor provides a sense of instant freedom by turning the usual rules of logical thinking inside out. Von Oech (1990) pointed out that humor spreads thinking, which helps to develop alternative ideas. Albrecht (1980) suggested that humor promotes the mental flexibility that leads to innovation.

Scott and Bruce (1994) suggested that innovative behavior begins with problem recognition and generation of ideas or solution, either novel or adopted. Janssen (2000) conceives innovative work behavior in the workplace as a complex behavior consisting of a set of different behavioral tasks: idea generation, idea promotion, and idea realization.

Based on previous arguments, this study predicts that the use of humor by leaders will have a direct and positive impact on employee innovative behavior. Thus,

Hypothesis 1: The use of humor by leaders will be positively related to employee innovative behavior.

2.2 Use of humor by leaders, employee communication, and employee innovative behavior

Humor has a positive effect on communication (Greatbatch and Clark, 2002; Gruner, 1976). Gruner (1976) proposed that humor makes messages interesting, motivates the audience to listen attentively, and contributes to effective communication. Humor also creates positive effects on communication (Kupier et al., 1995; Meyer, 1997; Moran, 1996), which contributes to the accuracy of communication. Greatbatch and Clark (2002) pointed out that humor in communication creates an open climate by stimulating positive emotions that enhance listening, understanding, and acceptance of messages.
Some researchers have suggested that humor has the potential to enhance leadership ability by shaping the work environment (Decker and Rotonodo, 2001). Hatch and Ehrlich (1993) and Heath (1997) argued humor may influence the communication process and shape the climate and informal social relations at work. As such, humor not only is a characteristic of the work environment, but also plays a positive role in the mood at work and in the communication channels between group members. The effect of humor on workers may be extended to the relationships between leaders and subordinates, as Decker and Rotonodo (2001) observed. Some researchers have suggested that humor can also facilitate information transfer between group members (Ullian, 1976; Winnick, 1976). Furthermore, the flow of information inside the organization plays a very important role in promoting innovation (Kivimaki et al., 2000), because the primary communications between employees and between supervisors and employees in the workplace are job-related. Thus, it is clear that the use of humor by leaders may contribute to the effectiveness of employee communication.

Several empirical studies have found that higher levels of communication and information gathering are associated with higher levels of performance in R&D project groups (Katz, 1982; Keller, 1986; Keller and Holland, 1983) and organizational innovation (Tjosvold and McNeely, 1988). Van de Van (1986) had explained these findings by arguing that as individuals have access to more information about available innovations, they are more likely to exhibit innovative ideas. In other words, individuals with a broader recognition of the results and implications of innovative ideas facilitate the process of organizational innovation.

Dougherty (1992) agreed that shared understandings can be powerful forces in driving technological innovation forward. Other studies have described the challenges of communicating in ways that foster such shared understandings within the innovation process. With such shared understandings, the possibility for innovation success appears to increase, but without them, innovation becomes more difficult (Green and Aiman-Smith, 2004). Thus, it is also clear that employee communication may contribute to employee innovation.

Taken together, the previous observations suggest that,

Hypothesis 2: Employee communication will mediate the relationship between the use of humor by leaders and employee innovative behavior.

2.3 Use of humor by leaders, group cohesiveness, and employee innovative behavior

Humor also has the potential ability to establish cohesiveness between organizational members, and it should be of interest to organizational scholars. Duncan (1982) argued that humor often has a direct impact on the cohesiveness of a group. Humor creates positive feelings among group members by reducing external threats and thus bringing together group members (Francis, 1994). In addition, through the reduction of external threats, group cohesiveness can be enhanced (Romero and Cruthirds, 2006). Humor also has positive effects on the socialization process by reducing the pressure on interactions (Morreall, 1991). Moreover, humor is thought to reduce the magnitude of conflict and to allow people to criticize without allowing those criticisms to affect the organizational climate (Dixon, 1980). Some empirical studies of humor indicated that humor can create and maintain social cohesion and group solidarity (Dwyer, 1991; Fine, 1996; Meyer, 1997, 2000). For example, Bonaiuto et al. (2003) investigate the structural organization of humorous sequences used in group negotiations. The results indicate that the use of humor in negotiation combines two classical functions of humor (namely, aggression and facilitating communication) as well as two main components of negotiation (namely, competition and cooperation). Thus, it is clear that the use of humor by leaders may contribute to the development of strong cohesiveness.

In turn, group cohesiveness has been found to result in improved group creativity (Romero and Pearson, 2004). O’Keefe et al. (1975) have shown that group cohesiveness is positively related to innovation adoption in scientific work team. Nystrom (1979) pointed out
that cohesiveness facilitates innovation because it increases feelings of self-actualization and psychological safety. Recently, the work of Wang et al. (2006) has also provided evidence of the impact of group cohesiveness on organizational Information System innovation implementation. Pelz and Andrews (1966) have shed light on the importance of cohesiveness in R&D team performance. Their findings indicated that cohesiveness is positively related to levels of creative performance in R&D teams. Based on these findings it is also clear that group cohesiveness may contribute to employee innovation. Therefore, the previous evidence predicts that

Hypothesis 3: Group cohesiveness will mediate the relationship between the use of humor by leaders and employee innovative behavior.

3. Methods

3.1 Sample and procedures

The target population of this study consisted of technical and research personnel who are R&D employees in manufacturing firms in Taiwan. Firms were selected from the top 1,000 manufacturing industry firms, published by Commonwealth Magazine in 2005 in Taiwan. In selecting firms, this study used two major criteria. First, the firms had to have set up an R&D department. Second, the R&D department had to have at least 10 team members. Fifty firms were selected randomly from the top 1,000 firms. The author then contacted the general managers or R&D director from each firm by telephone and asked them to participate in the study. Thirty-one firms met the major criteria and volunteered to participate in this study. Questionnaires were administered via company mail to study respondents who completed them during normal working hours. A total of 775 questionnaires were issued in this study. Within each questionnaire was a statement that explained the general purpose of the research and the voluntary nature of the participation, and assured participants of confidentiality. The completed questionnaires were mailed directly back to the author. A total of 239 valid questionnaires were retrieved, for an effective response rate of 30.83%. In order to guarantee the statistical representativeness of the samples, the difference between valid responses and invalid responses were examined. T-tests found no significant differences between valid and invalid responses for any of the independent or dependent variables (Armstrong and Overton, 1977).

3.2 Measures

Four constructs representing the use of humor by leaders, employee communication, group cohesiveness, and employee innovative behavior in the present study are defined and measured, as described below.

3.2.1 Use of humor by leaders

A complete review of the extensive literature on humor is beyond the scope of this study. There are many definitions of humor in the literature (Roeckelein, 2002). For example, Martineau (1972) defined humor as “any communicative instance which is perceived as humorous” and Crawford (1994) defined humor as “consists of nonverbal and verbal communication which produces a positive cognitive or affective response from listeners”. Based on the definition of Romero and Pearson (2004), this study defines the use of humor as when leaders produce “amusing communications that produce positive emotions and cognitions in the individual, group, or organization”.

Five items are used to assess the use of humor by leaders in the study. These items were developed by Avolio et al. (1999) with acceptable levels of reliability (Cronbach’s $\alpha = .90$). This scale measures employee perception of use of humor in terms of frequency of occurrence
by his or her direct supervisor in R&D department. Items were rated on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). A sample item is “the use of humor to take the edge off during stressful periods”.

3.2.2 Employee communication

With focus on R&D staff, this study considers the communication patterns among and/or within the innovation teams and shows how this affects their innovative behavior. Thus, this study follows Kratzer et al. (2004) in defining employee communication as “the discussion, development or evaluation of new ideas or approaches to technical problems, technical or scientific help or advice and/or the distribution of scientific or technical information”. Research has named this kind of communication “problem-solving communication” and it has been shown to be the main type of communication in innovation teams (e.g. Kratzer, 2001). Aiken et al. (1980) and Katz and Tushman (1979) found that the communication and information flows in innovative organizations or groups are related to successful innovation. For example, given very complex problems to solve, more effective innovation was associated with communication between members of the group. Essentially, technological and scientific problem solving is a communication and information processing activity (Fischer, 1980). At the same time, problem solving is an integral part of the process of innovation (Ebadi and Utterback, 1984). Thus, the meaning of employee communication in the study includes communication flow or idea relevant to the process of innovation.

Employee communication in the study was measured using two items adapted from employee communication scale developed by Ruppel and Harrington (2000). This communication scale does not measure personal communication. Rather, it focuses on communication skills relevant to the job of exchanging technical information between employees and/or management in an R&D department. There are two Likert-style statements, whose reliability Cronbach’s $\alpha$ in their study was .86. A sample item is “Our employees communicate technical information or ideas easily and freely with each other”. These items were rated using a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree).

3.2.3 Group cohesiveness

Elkins and Keller (2003) have suggested that by emphasizing group cohesiveness leaders can create an organizational climate of innovation. Montes et al. (2004), used the scales of psychological climate developed by Koys and Decotiis (1991), as a proxy for the operatively defined cohesiveness dimension of organizational climate. Of the several past empirical studies of cohesion, the construct for measuring psychological climate developed by Koys and Decotiis (1991), who defined group cohesiveness as “the perception of group spirit within the organization’s environment, including members’ willingness to provide material help,” was mostly closely aligned to the purposes of this study. We thus use the scale of Koys and Decotiis (1991) in this study.

There were five items on the scale developed by Koys and Decotiis (1991). Montes et al. (2005) provided evidence that the scale has acceptable levels of reliability and validity (composite reliability = .88, convergent validity = .66). A sample item is “People pitch in to help each other out”. All items were rated on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree).
3.2.4 Employee innovative behavior

The terms creativity and innovation are often used interchangeably in research studies, and the distinction between the two concepts may be more one of emphasis than of content (West and Farr, 1990). Mumford and Gustafson (1988) define creativity as the production of novel and useful ideas. Innovation has been defined in several ways. One of the first definitions was offered by Zaltman et al. (1973), who defined innovation as “any idea, practice, or material artifact perceived to be new by the relevant unit of adoption”. Kanter (1988) and Van de Ven (1986) define innovation as the production or adoption of useful ideas and idea implementation. From this perspective, innovative behavior begins with problem recognition and generation of ideas or solutions, either novel or adopted (Scott and Bruce, 1994). Following Scott and Bruce (1994), Janssen (2000) conceives innovative work behavior in the workplace to be a complex behavior consisting of a set of different behavioral tasks: idea generation, idea promotion, and idea realization. This study follows Janssen (2000) in defining employee innovative behavior as “the internal creation, introduction, and application of new ideas within a work role, group or organization”.

Janssen (2000), based on Kanter’s (1988) work on the stages of innovation, created the IWB (Innovative Work Behavior) scale, in which three items referred to idea generation, three items to idea promotion, and three items to idea realization. Individual Employee innovative behavior in this study was measured by the nine items developed by Janssen (2000) for the IWB scale. This study uses participant self-reporting to investigate how often participants performed innovative activities. The response format was a Likert-type 5-point scale in the study. This scale has been used and is considered a reliable measure of innovative behavior (Cronbach’s $\alpha = .96$, (Janssen, 2004). A sample item is “Searching out new working methods, techniques, or instruments”.

All items of the scales are fully reported in the Appendix. Because data for the current study are collected from firms in Taiwan, this study followed Brislin (1986)’s recommendation of translation and back-translation. First, all survey items were translated into Chinese by a bilingual individual who was not told the objective of the study. Next, another bilingual individual has been taken to back translate the Chinese version to English without access to the original instrument. The two English versions were carefully compared and a few changes were made to the Chinese version to ensure conceptual equivalence to the English original.

3.2.5 Control variables

Mumford and Gustafson (1988) identified the level of education of the innovators as important in innovation. This was obtained by self-report from respondents and coded as follows: elementary school, 1; junior school, 2; high school, 3; junior college, 4; bachelor’s degree, 5; master’s degree and Ph.D. degree, 6. Because this study focused on the level of the individual, age and gender were included.

3.3 Statistical analyses

Table 1 lists the characteristics of the sample. First, in order to ensure construct validity, the study carried out a confirmatory factor analysis for each construct using the LISREL 8.5 program.
Table 1. Characteristics of the sample

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>% (N= 239)</th>
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<tbody>
<tr>
<td>Gender</td>
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<td>Male</td>
<td>63.6 %</td>
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<td>Female</td>
<td>36.4 %</td>
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<td>Age</td>
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<td>29 years or less</td>
<td>42.3 %</td>
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<td>30-39 years</td>
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<tr>
<td>40-49 years</td>
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<td>50 years or over</td>
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<td>Master’s degree or above</td>
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<tr>
<td>Others</td>
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<tr>
<td>Technician</td>
<td>20.9 %</td>
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3.3.1 Confirmatory factor analyses

The study conducted a confirmatory factor analysis (CFA) for a single first-order model for use of the humor construct. Results showed that the single first-order factor model fitted the data satisfactorily ($\chi^2 = 8.48$, $df = 5$, GFI = .99, AGFI = .96, RMSEA = .054, NFI = .99). Next, because employee innovative behavior has three items for each subdimension: idea generation, idea promotion, and idea realization, a single second-order model for employee innovative behavior construct was established. The results showed that the single second-order factor model fitted the data well ($\chi^2 = 67.99$, $df = 24$, GFI = .94, AGFI = .90, RMSEA = .073, NFI = .96). Consistent with prior research, the results showed that these three subdimensions were highly intercorrelated ($r$ from .686 to .750). Given these high intercorrelations and following Janssen (2000), idea generation, idea promotion, and idea realization were conceived to combine additively to create an overall scale of innovative work behavior. Thus, this study averaged the nine items to create a single index, and used that for the statistical analyses. Finally, we again conducted a CFA analysis for a single first-order model for employee communication and group cohesiveness constructs, respectively. Results showed that these models also fitted the data satisfactorily ($\chi^2 = .00$, $df = 0$, RMSEA = .000; $\chi^2 = 2.00$, $df = 2$, GFI = 1.00, AGFI = .98, RMSEA = .003, NFI =1.00).

The study assessed construct reliability through calculation of composite reliability that assesses whether indicators are sufficient in their representation of their respective latent variables. As presented in Table 2, the results showed that these estimates of composite reliability range from .70 to .94. Their values all exceed .60, satisfying the general requirement of reliability for research instruments (Bagozzi and Yi, 1988). Cronbach’s $\alpha$ of the four constructs of the study all exceeded the threshold recommended by Hair et al. (1998), and were thus found to be reliable and to display internal consistency. The study also estimated the amount of shared variance among the indicators for a construct. Also presented in Table 2, the results showed that the average variance extracted (AVE) estimates range from .55 to .85. AVE estimates of .50 or higher indicate validity for a construct’s measure
(Fornell and Larcker, 1981). All estimates are well above the value that suggests acceptable convergent validity.

Table 2. Internal consistency, composite reliability and convergent validity

<table>
<thead>
<tr>
<th>Variables</th>
<th>Factor loading</th>
<th>Cronbach’s α</th>
<th>( R^2 )</th>
<th>Composite reliability (CR)</th>
<th>Average variance extracted (AVE)</th>
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</table>

** \( p < .01 \)**

Because the study obtained the measures of both predictor and criterion variables from the same rater, to minimize the effects of common method variance, several different approaches were employed in designing the questionnaire in this study, as suggested by Podsakoff et al. (2003). First, we counterbalanced the order of the measurement of the predictor and criterion variables, to reduce the biases related to the question context. Second, some items in the questionnaire were reverse coded in order to reduce the effects of consistency artifacts. Third, participant answers were anonymous. Fourth, it was explained to the respondents that there are no right or wrong answers and that they should answer questions as honestly as possible. After collecting the data, the study also examined the fit of a model in which all indicators loaded on one factor to assess the severity of common method variance. The logical foundation of the single factor procedure is that, if common method variance is largely
responsible for the covariance among the measures, a confirmatory factor analysis should indicate that a single factor fits the data (Podsakoff and Organ, 1986). The results indicate that a one factor model did not fit the sample well (CFI = .48, RMSEA = .26). Thus, the design of the questionnaire as well as the post hoc test suggest that common method variance is not of great concern.

Before conducting regression analyses, the study examined residual plots and Kolmogorov–Smirnov (KS) tests and verified that regression assumptions were met. In order to test the hypotheses, hierarchical regression analyses were conducted. The suitability of the regression analysis was examined by testing for multicollinearity by checking the VIF (Variable Inflation Factor) and CI (Condition Index). This examination did not reveal any violation in conducting the multiple regression.

This study predicted that employee communication (Hypothesis 2) and group cohesiveness (Hypothesis 3) would mediate the use of humor and employee innovative behavior relations. If a variable is to be considered a mediator of an outcome, four conditions should be met: (a) the independent variable involved should make a significant contribution to the outcome, (b) the independent variable should make a significant contribution to be the mediator, (c) the mediator should make a significant contribution to the outcome, and (d) when the influence of the mediator is held constant, the contribution of the independent variable to the outcome should become nonsignificant (Baron and Kenny, 1986).

Because all the constructs were validated and reliable, the scale items measuring use of humor by leaders, employee communication, group cohesiveness, and innovative behavior were averaged to obtain a single score for each construct in the analyses.

4. Results

4.1 Correlation analyses

Table 3 provides means, standard deviations, and correlations for all measures. Gender was the only demographic variable significantly correlated with use of humor (r = .13, p < .05) and employee innovative behavior (r = .15, p < .05). Employee innovative behavior was positively, significantly correlated with use of humor (r = .13, p < .05), employee communication (r = .35, p < .001), and group cohesiveness (r = .44, p < .001). Use of humor was positively, significantly correlated with employee communication (r = .29, p < .001) and group cohesiveness (r = .27, p < .001). Finally, employee communication was also positively, significantly correlated with group cohesiveness (r = .68, p < .001).

Table 3. Means, standard deviations, and correlations (N=239)

<table>
<thead>
<tr>
<th>Variables</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gender</td>
<td>.64</td>
<td>.48</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Age</td>
<td>1.79</td>
<td>.82</td>
<td>.23***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Education</td>
<td>4.69</td>
<td>.98</td>
<td>.06</td>
<td>-.15*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Use of humor</td>
<td>3.06</td>
<td>.84</td>
<td>.13*</td>
<td>.00</td>
<td>-.08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Employee communication</td>
<td>3.58</td>
<td>.87</td>
<td>.08</td>
<td>.08</td>
<td>.03</td>
<td>.29***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Group cohesiveness</td>
<td>3.70</td>
<td>.77</td>
<td>.06</td>
<td>.08</td>
<td>.12</td>
<td>.27**</td>
<td>.68***</td>
<td></td>
</tr>
<tr>
<td>7. Innovative behavior</td>
<td>3.79</td>
<td>.66</td>
<td>.15*</td>
<td>.04</td>
<td>.10</td>
<td>.13*</td>
<td>.35***</td>
<td>.44***</td>
</tr>
</tbody>
</table>

* Gender (male = 1, female = 0) : * p < .05 *** p < .001
4.2 Hierarchical regression analyses

For the purpose of testing hypotheses, hierarchical regression analyses were conducted. The study introduced the block of control variables and employee innovative behaviour into the equation, followed by the appropriate independent and mediating variables. As shown in Column 1 of Table 4, use of humor made a significant contribution to employee innovative behavior ($\beta = .13, p < .05$), thereby meeting Condition (a). Moreover, this result also leads to the conclusion that use of humor was positively related to employee innovative behavior and Hypothesis 1 was supported.

To examine if the use of humor by leaders contributed to the mediators (employee communication and group cohesiveness) the next two regression equations were built. The results shown in Columns 2 and 3 indicate that use of humor by leaders made a positive and significant contribution to both employee communication and group cohesiveness respectively ($\beta = .30, p < .001$; $\beta = .29, p < .001$). These results meet Condition (b) for mediation and suggest that the leader’s use of humor contributed to employee communication and group cohesiveness.

To examine Condition (c), the controls, employee communication, and group cohesiveness were being entered into an equation predicting employee innovative behavior. As shown in Column 4, both employee communication and group cohesiveness made a significant contribution to employee innovative behavior ($\beta = .34, p < .001$; $\beta = .31, p < .001$), therefore meeting Condition (c).

To examine Condition (d), the controls, use of humor by leaders, employee communication, and group cohesiveness were entered into an equation predicting employee innovative behavior. The results in Column 5 show that when Condition (d) is met - when employee communication and group cohesiveness are controlled for, the coefficient for use of humor becomes nonsignificant ($\beta = -.01, p > .05$).

In total, these results support Hypothesis 2 and Hypothesis 3 and indicate that both employee communication and group cohesiveness complete mediate the relations between the use of humor and employee innovative behavior.
Table 4. Summary of hierarchical regression analysis results (N=239)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Innovative behavior</th>
<th>Employee communication</th>
<th>Group cohesiveness</th>
<th>Innovative behavior</th>
<th>Innovative behavior</th>
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<tbody>
<tr>
<td></td>
<td>( \beta )</td>
<td>( t )</td>
<td>( \beta )</td>
<td>( t )</td>
<td>( \beta )</td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (^a)</td>
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<td>1.51</td>
<td>.02</td>
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<td>-.03</td>
</tr>
<tr>
<td>Age</td>
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<td>.09</td>
<td>1.45</td>
<td>.11</td>
</tr>
<tr>
<td>Education</td>
<td>.12</td>
<td>1.82</td>
<td>.07</td>
<td>1.07</td>
<td>.15</td>
</tr>
<tr>
<td>( R^2 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.03</td>
<td>.01</td>
<td>.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of humor</td>
<td>.13</td>
<td>1.99*</td>
<td>.30</td>
<td>4.65***</td>
<td>.29</td>
</tr>
<tr>
<td>( \Delta R^2 )</td>
<td>.02</td>
<td>.08</td>
<td>.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.34</td>
</tr>
<tr>
<td>( \Delta R^2 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.12</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.31</td>
</tr>
<tr>
<td>Group cohesiveness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \Delta R^2 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.07</td>
</tr>
<tr>
<td>( R^2 ) for total</td>
<td>.05</td>
<td>.09</td>
<td>.11</td>
<td>.22</td>
<td>.22</td>
</tr>
<tr>
<td>F for total</td>
<td>2.73*</td>
<td>6.25***</td>
<td>7.06***</td>
<td>12.89***</td>
<td>10.70***</td>
</tr>
</tbody>
</table>

\(^a\) Gender (male=1, female=0); \* \( p < .05 \) \ *** \( p < .001 \)
5. Discussion and conclusion

This study showed that the use of humor by leaders had a positive, direct relationship on R&D employee innovative behavior. The finding was consistent with earlier research (Csikszentmihalyi, 1996; Murdock and Ganim, 1993; Dixon, 1980). However, the study was a preliminary investigation of the relationship between the use of humor by leaders and employee innovative behavior. Additionally, this study also examined the contributions of the use of humor by leaders to employee communication and group cohesiveness, and explored the possibility that both employee communication and group cohesiveness mediated the association between the use of humor by leaders and innovative behavior.

Consistent with results obtained in previous studies (Greatbatch and Clark, 2002; Grunner, 1976), the results showed that the use of humor by leaders made a positive, significant contribution to effective employee communication. Similarly, consistent with results obtained in previous studies (Duncan, 1982; Francis, 1994), the results showed that use of humor by leaders made a positive, significant contribution to group cohesiveness. However, the present study conducted the first empirical exploration of whether employee communication and group cohesiveness were mediating the association between the use of humor by leaders and innovative behavior association. These findings add to the further understanding that the use of humor by leaders can enhance employee innovative behavior indirectly by creating employee communication and group cohesiveness.

Taken together, these findings provide insights into how the use of humor by leaders might influence the work environment for employee innovative behavior. Thus, the first contribution of the study provides empirical evidence from Taiwan confirming that the use of humor by leaders is positively related to employee innovative behavior. Few studies have tested this possibility in actual work settings. The second contribution of this study is that it explains the relationship between use of humor by leaders and employee innovative behavior by formulating and empirically testing the effects of employee communication and group cohesiveness. It is worth noting that these findings also tested Amabile’s componential theory. The central prediction of the componential theory is that the social environment (work environment) will impact individual creativity. The use of humor by leaders, employee communication, and group cohesiveness were examined as key components of the social environment for creativity in the study. Consequently, another contribution of this study is to identify possible social-environment influences on employee creativity. Future research might identify other psychological processes (for example, stress) that mediate or moderate the relations between contextual factors and employee innovative behavior.

Given the need for innovation has become critical, finding the link between use of humor by leaders and employee innovative behavior is important to practitioners. The results of this study have implications for the management of innovation. First, they suggest that it may be possible to affect employee innovation if supervisors are trained and encouraged to use humor. For example, much practitioner literature has focused on ways to make the work environment less formal or serious by using humorous games, contests, or activities designed to relax the workplace and enhance relationships. Such methods may be a good alternative for managers who lack a natural ability to be humorous to infuse the work environment with humor. Consequently, providing managers with a humor skills training program to improve their humor skills may result in an increased level of creative behavior among employees. Moreover, this practice may be especially helpful for employees with relatively little experience in innovative behavior or with relatively low levels of innovative motivation. Second, it is noteworthy that leaders who valued the use of humor and had good humor skills were important in the selection and placement of human resource management. That is, the
use of humor may serve as a useful selection tool (Keller, 1984). Thus, hiring or selecting new managers who had good humor skills is one way of helping assure that their employees will make creative contributions. Third, since the core product of innovation activities is knowledge, and this knowledge can only be created through interaction between employees, good employee communication and group cohesiveness in the performance of innovation activities is necessary. It is very important that managers can use humor to improve employee communication and group cohesiveness and conducting innovative efforts, especially if their workplace is full of high need of innovation activities. By showing employee communication or group cohesiveness as a mediator, results suggest that managers need to consider the mechanism by which use of humor by leaders is related to innovative behavior. By doing so, managers may be more able to direct the influence of humor to proper psychological process, and ultimately obtain greater innovative behavior. In addition, the findings also suggest that employees who experience employee communication or group cohesiveness are likely to exhibit high innovative behavior. Thus, implementing other strategies that have been shown to enhance employee communication or group cohesiveness, such as improving the organizational climate, should also have desirable effects. For example, managers can create an innovative climate emphasizing both employee communication and group cohesiveness.

Several limitations of the present study suggest directions for future research. First, despite our use of several methods to test for common method variance, and our finding that it should be of no great concern, because the measures used for the predictor (use of humor by leaders), the mediator (employee communication or group cohesiveness), and outcome (individual innovative behavior) were taken from one source (R&D employees), common method variance may still be a problem. Data obtained from the subjective perceptions of the respondent may contain a response bias. Second, although the study was cross-sectional, the construct relationships suggest causal direction. Causal inferences made from cross-sectional designs are only inferences. Future research should examine longitudinal and/or experimental data to assess causality. Third, humor is a double-edged sword (Malone, 1980), because it can be perceived as humorous by one person yet offensive by another person. Further, the use of humor measured in the study was single index only. It is necessary to apply a multi-dimensional conceptualization of humor. Researchers have recently proposed four humor styles suitable for this purpose (Martin et al., 2003). It is possible to employ any of these humor styles in combination and to varying degrees. Future study might examine how the various styles of humor can affect employee communication, group cohesiveness, and employee innovative behavior. Finally, this study was conducted in Taiwan. It may be that different results would be obtained in different countries and cultural settings. Future study might address this issue by using cross-cultural comparisons to strengthen the causal inference.

References


Fornell, C., Larcker, D.F. (1981) Structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 18, 39-50.


### Appendix Measures of Constructs

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Indicators</th>
<th>Source</th>
</tr>
</thead>
</table>
| Use of humor by leaders | 1. My direct supervisor always uses humor to take the edge off during stressful periods.  
2. My direct supervisor always uses a funny story to turn an argument in his or her favor.  
3. My direct supervisor always makes us laugh at ourselves when we are too serious.  
4. My direct supervisor always uses amusing stories to defuse conflicts.  
5. My direct supervisor always uses wit to make friends of the opposition.                                                        | Avolio et al. (1999)                        |
| Employee communication | 1. In our department, employees communicate easily and freely with each other in technical information or idea.  
2. In our department, employees communicate easily and freely with members of management in technical information or idea.                                      | Ruppel & Harrington (2000)                  |
| Group cohesiveness    | 1. In our department, people pitch in to help each other out.  
2. In our department, people tend to get along with each other.  
3. In our department, people take a personal interest in one another.  
4. There is a lot of “team spirit” among people in our department.  
5. I feel like I have a lot in common with the people I know in our department.                                                 | Koys & Decotiis (1991)                      |
| Innovative behavior   | 1. I like creating new ideas for difficult issues.  
2. I like searching out new working methods, techniques, or instruments.  
| Idea generation       | 4. I like mobilizing support for innovative idea.  
5. I like acquiring approval for innovative idea.  
6. I like making important organizational members enthusiastic for innovative ideas.                                                          |                                             |
| Idea promotion        | 7. I like transforming innovative ideas into useful applications.  
8. I like introducing innovative ideas into the work environment in a systematic way.  
9. I like evaluating the utility of innovative ideas.                                                                                       |                                             |
| Idea realization      |                                                                                                                                            |                                             |