

LINKING EMPOWERING LEADERSHIP AND EMPLOYEE CREATIVITY: THE INFLUENCE OF PSYCHOLOGICAL EMPOWERMENT, INTRINSIC MOTIVATION, AND CREATIVE PROCESS ENGAGEMENT

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Synthesizing theories of leadership, empowerment, and creativity, this research built and tested a theoretical model linking empowering leadership with creativity via several intervening variables. Using survey data from professional employees and their supervisors in a large information technology company in China, we found that, as anticipated, empowering leadership positively affected psychological empowerment, which in turn influenced both intrinsic motivation and creative process engagement. These latter two variables then had a positive influence on creativity. Empowerment role identity moderated the link between empowering leadership and psychological empowerment, whereas leader encouragement of creativity moderated the connection between psychological empowerment and creative process engagement.

Given increasingly turbulent environments, heightened competition, and unpredictable technological change, more and more managers are coming to realize that they should encourage their employees to be creative (Shalley & Gilson, 2004). Considerable evidence indicates that employee creativity can fundamentally contribute to organizational innovation, effectiveness, and survival (Amabile, 1996; Shalley, Zhou, & Oldham, 2004). *Creativity* refers to the production of novel and useful ideas by an individual or by a group of individuals working together (Amabile, 1988; Madjar, Oldham, & Pratt, 2002; Shalley, Gilson, & Blum, 2000; Zhou & Shalley, 2003). For creativity to occur in organizations, managers need to support and promote it, as they are the individuals who are most knowledgeable about which employee work outcomes should be creative and they have considerable influence over the context within which creativity can occur (Shalley & Gilson, 2004).

Although a number of studies have investigated the impact of leaders on creativity, these investigations have largely focused on issues of leader support (e.g., Amabile, Schatzel, Moneta, & Kramer, 2004) and leader-member exchange (e.g., Tierney, Farmer, & Graen, 1999). More recently, researchers have begun investigating broader theories of lead-

ership behavior, such as transformational leadership theory, with mixed results (see Tierney, 2008: 106). Noticeably missing from research attention has been empowering leadership, despite suggestions by creativity researchers that scholars focus greater effort on leadership approaches that can address the elemental underpinnings of creativity (Mumford, Scott, Gaddis, & Strange, 2002; Tierney, 2008). Because empowering leadership involves sharing power with a view toward enhancing employees' motivation and investment in their work (Kirkman & Rosen, 1997, 1999; Thomas & Velthouse, 1990), there are major reasons (detailed below) to expect empowering leadership to have a positive impact on creativity (Amabile, 1988; Amabile, Conti, Coon, Lazenby, & Herron, 1996; Amabile et al., 2004; Thomas & Velthouse, 1990; Zhou, 1998). Therefore, a major purpose of this study was to build and test theory that addresses the connection between empowering leadership and creativity, including several important intervening variables.

In building a model linking empowering leadership and creativity, we further drew on the psychological empowerment literature and the creativity literature to posit three mediating mechanisms with high potential to help explain linkages between empowering leadership and creativity: psychological empowerment, creative process engagement, and intrinsic motivation. The first mechanism, psychological empowerment, is defined as a psychological state

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that is manifested in four cognitions: meaning, competence, self-determination, and impact (Spreitzer, 1995). We thus explored the extent to which empowering leadership works through psychological empowerment to ultimately influence employee creativity.

Theoretical arguments have suggested that psychological empowerment, in turn, makes a critical contribution to employee creativity by positively affecting an employee's intrinsic motivation (Amabile, 1996; Spreitzer, 1995), but empirical evidence of such an effect has been lacking (Shalley et al., 2004). This connection is important because, conceptually, intrinsic motivation is considered to be a well-established predictor of creativity (Amabile, 1996; Shalley et al., 2004). Intrinsic motivation is the extent to which an individual is interested in a task and engages in it for the sake of the task itself (Utman, 1997). We posit intrinsic motivation as a second mediating element linking empowering leadership and creativity; we theorize that it acts as a connector between psychological empowerment and creative outcomes.

According to Amabile's (1983) "componential conceptualization" of creativity, intrinsic task motivation is a necessary, but not sufficient, condition for creative outcomes. Amabile argued that engaging in creative process activities has an equal, if not more important, influence on individual creative behaviors. Several researchers have begun to emphasize the value of understanding the creative process whereby individuals come to develop creative ideas, and they have called for more studies addressing this issue (Drazin, Glynn, & Kazanjian, 1999; Mumford, 2000; Shalley et al., 2004). In considering this aspect, we argue for the role of a third mediating variable, creative process engagement, which we posit as also helping to connect psychological empowerment with creative outcomes. Creative process engagement is defined as employee involvement in creativity-relevant methods or processes, including (1) problem identification, (2) information searching and encoding, and (3) idea and alternative generation (Amabile, 1983; Reiter-Palmon & Illies, 2004).

Although "creativity" can be used to describe both an outcome and a process (Shalley & Zhou, 2008), in this article we use the word in the outcome sense—that is, to denote the extent to which novel and useful ideas are produced. We use "creative process engagement" to refer to the process by which creativity occurs. Our use of these two terms allowed us to differentiate creative processes from creative outcomes in our model building. We note that we focus on the three creative processes outlined above because they are generally viewed as

the creative idea production phases of creative problem solving.¹

Finally, we further built theory via this study by positing and testing two potentially important moderators of the empowering leadership–creativity process: empowerment role identity and leader encouragement of creativity. Empowerment role identity is the extent to which an individual views him- or herself as a person who wants to be empowered in a particular job. Leader encouragement of creativity refers to the extent of leader emphasis on an employee's being creative and actively engaging in processes that may lead to creative outcomes.

Overall, our purpose was and is to build theory by conceptually and empirically linking empowering leadership theory, psychological empowerment theory, and relevant creativity theories in answer to calls for a more comprehensive understanding of the empowering leadership phenomenon as it relates to employee creativity (Menon, 2001; Shalley et al., 2004).

THEORY AND HYPOTHESES

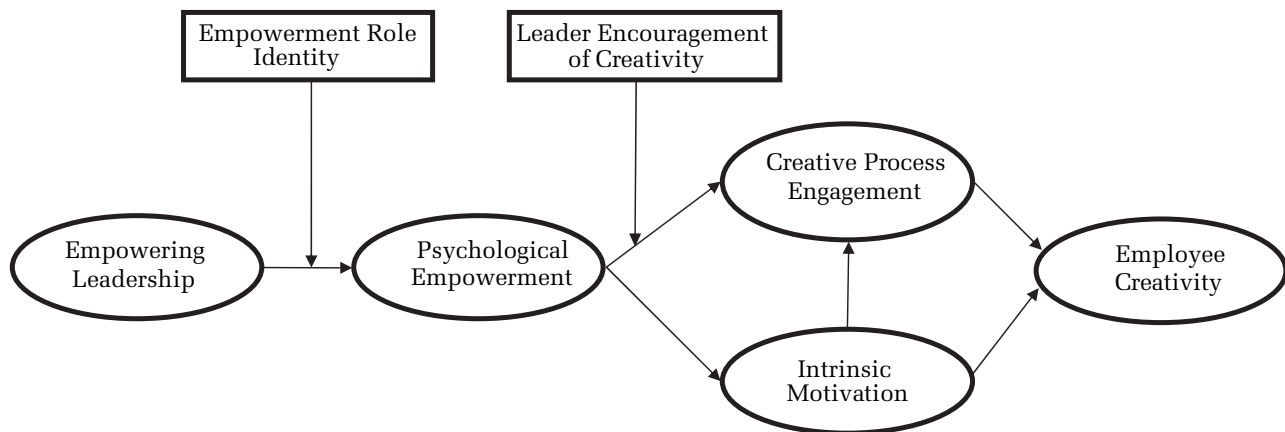
In this section, we trace the development of our overall research model by first exploring the general nature of empowering leadership as it relates to creativity. We next investigate how empowering leadership influences psychological empowerment as delineated by Spreitzer (1995), including consideration of a potential moderator, empowerment role identity. We then examine the influence of psychological empowerment on intrinsic motivation and creative process engagement. As part of these arguments, we incorporate leader encouragement of creativity as a moderating variable to help explain how leaders can affect the extent to which psychological empowerment influences employee creativity via creative process engagement. Finally, we examine links among intrinsic motivation, creative process engagement, and employee creativity. The hypothesized model is depicted in Figure 1.

Empowering Leadership and Creativity

Recent research indicates that different forms of leadership are related to employee creativity (e.g.,

¹ Evaluation of ideas/alternatives, another part of the creative process, is typically considered part of the implementation phase that follows, and is less dependent on, creative idea development (Gilson & Shalley, 2004; Mumford, 2001; Mumford & Connelly, 1991; Reiter-Palmon & Illies, 2004).

FIGURE 1
Hypothesized Model



Amabile et al., 2004; George & Zhou, 2007; Shalley & Gilson, 2004; Shin & Zhou, 2003, 2007; Tierney et al., 1999). For instance, Tierney et al. (1999) found that effective leader-member exchange (LMX) relationships are positively associated with employee creativity, a finding supported by related research (e.g., Scott & Bruce, 1994). Studies also have provided evidence for a positive relationship between supportive leadership and creativity, and a negative relationship between controlling leadership and employee creativity (e.g., Amabile et al., 2004; Madjar et al., 2002; Oldham & Cummings, 1996; Tierney & Farmer, 2002, 2004). In considering broader leadership approaches, some studies have shown support for a positive impact of transformational leadership on employee creativity (e.g., Howell & Avolio, 1993; Jung, Chow, & Wu, 2003; Keller, 1992; Shin & Zhou, 2003; Sosik, Kahai, & Avolio, 1998), but others have produced contrary results (e.g., Basu & Green, 1997; Jaussi & Dionne, 2003; Kahai, Sosik, & Avolio, 2003).

Surprisingly lacking research attention is a leadership approach with considerable promise of influencing employee creativity: empowering leadership. In view of evidence that leaders can affect employee creativity, several creativity scholars have argued for a closer look at leadership behaviors or styles that might fundamentally address the nature of creative work (e.g., Mumford et al., 2002; Tierney, 2008). Such work tends to involve complicated, ill-defined problems for which novel and useful solutions are far from obvious (Ford, 2000; Mumford et al., 2002; Reiter-Palmon & Illies, 2004). As a result, leaders cannot rely on predefined structures that spell out means or even precise ends. Instead, they must encourage employee motivation to solve these problems and yet enable consider-

able employee latitude. We propose that one approach to doing so is empowering leadership.

According to Ahearne, Mathieu, and Rapp's (2005) conceptualization, empowering leadership involves highlighting the significance of the work, providing participation in decision making, conveying confidence that performance will be high, and removing bureaucratic constraints. These behaviors are conceptually highly relevant to creativity. For instance, it is clear from the creativity literature that participation in decision making and perceptions of autonomy are vital preconditions for creative outcomes (Amabile, 1988; Amabile et al., 2004). Inherent in the combination of empowering leadership behaviors is delegating authority to an employee, so as to enable the employee to make decisions and implement actions without direct supervision or intervention (Bass, 1985; Jung et al., 2003). Given the nature of creativity, such delegation helps establish a work context wherein an employee is encouraged and empowered to explore diverse creative alternatives before (perhaps) settling on a viable creative solution (Amabile et al., 1996). We define empowering leadership as the process of implementing conditions that enable sharing power with an employee by delineating the significance of the employee's job, providing greater decision-making autonomy, expressing confidence in the employee's capabilities, and removing hindrances to performance (Ahearne et al., 2005; Arnold, Arad, Rhoades, & Drasgow, 2000; Kirkman & Rosen, 1997, 1999).

Like the construct of leader-member exchange (Dansereau, Graen, & Haga, 1975; Graen & Uhl-Bien, 1995), empowering leadership relies theoretically on the idea of vertical dyad linkage, and empowering leadership as a dyadic phenomenon is

the focus of this study. Along these lines, Forrester argued that a main reason why organizational empowerment initiatives often fall short is that they take a “one-size-fits all empowerment approach” (2000: 69) that fails to differentiate among employees’ capabilities and desires. Ford and Fottler posited that empowerment is “a matter of degree rather than an absolute” (2005: 22), indicating that managers need to make judgments regarding whom to empower and to what extent. A number of empirical studies have supported the notion that empowerment can be productively viewed as a dyadic relationship between a supervisor and an individual subordinate (e.g., Ahearne et al., 2005, Robert, Probst, Martocchio, Drasgow, & Lawler, 2000). For instance, Keller and Dansereau (1995) provided evidence that empowerment-related leadership practices are individualized at the subordinate level. Empirical studies by Ahearne et al. (2005) and Leana (1986) have shown that supervisors differentiate among subordinates in the degree of latitude they allow. Yukl and Fu (1999), in an extensive study that relied on surveys, interviews, and focus groups, concluded that managers delegated more to subordinates whom they viewed as competent, as pursuing task objectives congruent with the managers,’ and as having favorable relationships with the managers.

In line with this research, Menon argued that to achieve an adequate understanding of empowerment processes it is important to consider the “perspective of the individual employee” (2001: 158), pointing out that, for the empowering behavior of a leader to have its intended effect, the focal employee must, in turn, feel psychologically empowered. Accordingly, we next consider the issue of psychological empowerment.

Empowering Leadership and Psychological Empowerment

Psychological empowerment is conceptualized as an experienced psychological state or set of cognitions. Conger and Kanungo (1988) defined psychological empowerment as a process of heightening feelings of employee self-efficacy “through the identification of conditions that foster powerlessness and through their removal by both formal organizational practices and informal techniques of providing efficacy information” (1988: 474). Thomas and Velthouse (1990) extended this approach by specifying a more complete set of task assessments (meaningfulness, competence, choice, and impact) that determine intrinsic task motivation in workers. Drawing on both Conger and Kanungo (1988) and Thomas and Velthouse (1990),

Spreitzer (1995) defined empowerment as a process or psychological state manifested in four cognitions: meaning, competence, self-determination, and impact. Specifically, *meaning* concerns a sense of feeling that one’s work is personally important. *Competence* refers to self-efficacy, or belief in one’s ability to successfully perform tasks. *Self-determination* indicates perceptions of freedom to choose how to initiate and carry out tasks. *Impact* represents the degree to which one views one’s behaviors as making a difference in work outcomes. Spreitzer (1995) presented evidence that the four dimensions (meaning, competence, self-determination, and impact), although distinct, reflect an overall psychological empowerment construct. Thus, psychological empowerment is seen as an enabling process that enhances an employee’s task initiation and persistence (Conger & Kanungo, 1988).

Conceptually, a case can be made for a close relationship between empowering leadership and psychological empowerment, despite the limited research in this area (Ahearne et al., 2005; Zhang & Sims, 2005). First of all, an empowering leader tends to enhance the meaningfulness of work by helping an employee understand the importance of his or her contribution to overall organizational effectiveness. Second, an empowering leader expresses confidence in an employee’s competence and prospects for high performance. For instance, Ahearne et al. (2005) found a positive relationship between empowering leadership and employee self-efficacy. Third, an empowering leader provides an employee with autonomy and prospects for self-determination by encouraging the individual to decide how to carry out his or her job (Pearce et al., 2003; Sims & Manz, 1996). Lastly, an empowering leader fosters an employee’s participation in decision making (Manz & Sims, 1987). This process potentially gives an employee a feeling of greater control over the immediate work situation and an enhanced sense that his or her own behaviors can make a difference in work results, thus promoting the sense of impact. Therefore, it is reasonable to argue that empowering leadership influences a follower’s perceptions of psychological empowerment. Accordingly, we propose:

Hypothesis 1. Empowering leadership is positively related to employee psychological empowerment.

Moderation by Empowerment Role Identity

Although, generally, we expect empowering leadership to positively influence psychological empowerment, there is some evidence that employ-

ees differ in the extent to which they welcome and see themselves as psychologically empowered, even in a context of empowering leader behaviors (Ahearne et al., 2005; Forrester, 2000). To assess this prospect, we draw on role identity theory (Burke, 1991; Burke & Tully, 1997; Stryker, 1980; Stryker & Burke, 2000), according to which individuals develop expectations regarding appropriate behavior in various roles and internalize them as components of self or role identities. A role identity, then, is a self-view, or meaning ascribed to the self with respect to a specific role (Farmer, Tierney, & Kung-Mcintyre, 2003; Stryker, 1980). Individuals use role identities as cognitive schemata to provide meaning for the self, help interpret events, and channel behavioral options (Callero, Howard, & Piliavin, 1987; Piliavin, Grube, & Callero, 2002; Stryker & Burke, 2000). As mentioned earlier, we define empowerment role identity as the extent to which an individual views him- or herself as a person who wants to be empowered in a particular job. According to role theory, role identity is composed of related "multiple selves" that are defined further as a hierarchical ranking of identities. Individuals carry out multiple roles in order of salience, judging some identities to be more important than others (McCall & Simmons, 1966; Stryker & Serpe, 1994).

In the case of empowerment, a grounded method study by Labianca, Gray, and Brass concluded that resistance to empowerment in the context of a change initiative was motivated more by "well established, ingrained schema" (2000: 235) regarding appropriate actions associated with an employee's role than by self-interest. Kirkman and Shapiro (1997) theorized that employees differ in the extent to which they desire self-control or self-management and suggested that an employee is more likely to be resistive when he or she is uncomfortable with work-related decision making, is reluctant to work autonomously, and assumes a passive rather than proactive stance with respect to work goals. Such resistance has been shown to be associated with lower job satisfaction and lower organizational commitment (Kirkman & Shapiro, 2001; Maynard, Mathieu, Marsh, & Ruddy, 2007), supporting the notion that some workers consider empowerment as inconsistent with their desires and role perceptions. Forrester (2000) argued that some employees may view themselves as unready to handle new responsibilities or have other reasons for not wanting to take on more empowered roles. On the other hand, role identity theory (Stryker, 1980; Stryker & Burke, 2000) suggests that an employee who envisions empowerment in a positive way is likely to regard it as fitting within his or her role

identity set and to experience greater psychological empowerment in an empowering leadership context. Accordingly, we propose:

Hypothesis 2. Empowerment role identity strengthens the relationship between empowering leadership and psychological empowerment.

Psychological Empowerment and Intrinsic Motivation

In considering the role of psychological empowerment in facilitating creativity, we note available evidence demonstrating links between psychological empowerment and intrinsic motivation. Intrinsic motivation refers to the extent to which an individual is inner-directed, is interested in or fascinated with a task, and engages in it for the sake of the task itself (Utman, 1997). According to Amabile's (1983) componential conceptualization of creativity, intrinsic motivation is one of the most important and powerful influences on employee creativity (Amabile, 1988, 1996; Amabile et al., 1996; Shalley, 1991, 1995).

Thomas and Velthouse posited that psychological empowerment is "presumed to be a proximal cause of intrinsic task motivation and satisfaction" (1990: 668). Gagne, Senecal, and Koestner (1997) demonstrated a positive, significant relationship between meaningfulness and intrinsic task motivation. Koestner, Ryan, Bernieri, and Holt (1984) also showed that feelings of self-determination positively relate to intrinsic motivation. Therefore, on the basis of theoretical arguments and previous studies demonstrating links between the elements of psychological empowerment and intrinsic motivation (Spreitzer, 1995, 1996), we propose:

Hypothesis 3. Psychological empowerment is positively related to intrinsic motivation.

Psychological Empowerment and Creative Process Engagement

According to Amabile's (1983) componential conceptualization of creativity, intrinsic motivation is a necessary but not sufficient condition for creative outcomes. Engaging in creative activities has an equal, if not more important, role in promoting employee creativity (Amabile, 1988, 1996; Amabile et al., 1996). Recently, several scholars (e.g., Mainemelis, 2001; Mumford, 2000; Shalley et al., 2004) have suggested that a promising direction for creativity research would be to focus on achieving a better understanding of the process that eventually leads to creative outcomes. As mentioned earlier, we define creative process engagement as em-

employee involvement or engagement in creativity-relevant cognitive processes, including (1) problem identification, (2) information searching and encoding, and (3) idea and alternative generation (Amabile, 1983; Reiter-Palmon & Illies, 2004). Simple solutions that may not be novel and useful may emerge when individuals minimally engage in the process. On the other hand, when an individual spends effort to more fully identify a problem, obtains as much information as possible, and generates numerous ideas and alternatives, solutions that are both novel and useful are more likely to be produced. This line of reasoning is congruent with research findings that the first ideas generated tend to be routine and less creative, whereas ideas identified later in a process of idea generation tend to be more creative (Runco, 1986).

We theorize that psychological empowerment may have important influences on an employee's willingness to engage in a creative process. Specifically, when an employee perceives that his or her job requirements are meaningful and personally important, the employee will spend more effort on understanding a problem from multiple perspectives, searching for a solution using a wide variety of information from multiple sources, and generating a significant number of alternatives by connecting diverse sources of information (Gilson & Shalley, 2004; Jabri, 1991). In addition, when an employee believes that he or she has the ability to perform a task successfully, has a certain degree of self-determination over job execution, and can shape desired outcomes through his or her behaviors, the employee is likely to focus on an idea or a problem longer and more persistently (Deci & Ryan, 1991; Spreitzer, 1995). Such an employee is also more likely to take risks, explore new cognitive pathways, and be playful with ideas (Amabile et al., 1996). Accordingly, we propose:

Hypothesis 4. Psychological empowerment is positively related to creative process engagement.

Moderation by Leader Encouragement of Creativity

Although there are conceptual and empirical reasons to expect that a psychologically empowered employee will be more prone to creative process engagement, psychological empowerment, by definition, leaves an employee with considerable latitude. Nevertheless, leaders can actively encourage engagement by articulating the need for creative job outcomes, spelling out what the organization values, and calling attention to the effectiveness of

engaging in processes likely to lead to creative outcomes. Leader encouragement of creativity is defined as the extent of a leader's emphasis on being creative and on actively engaging in processes that may lead to creative outcomes. Such emphasis is likely to prime employee attention and facilitate effort toward trying to be creative (Scott & Bruce, 1994; Wyer & Srull, 1980).

Several studies have suggested that when individuals know the importance of creativity in their jobs, they are more likely to actually be creative (e.g., Carson & Carson, 1993; Speller & Schumacher, 1975). For example, Shalley (1991, 1995) found that assigned creativity goals effectively enhanced employee creative performance, whereas assigned performance goals (e.g., production quantity) actually detracted from creative performance. Similarly, Pinto and Prescott (1988) concluded that a clearly stated mission by a leader enables a greater focus on new idea development and subsequent successful innovation. Thus, we expect psychological empowerment and leader encouragement of creativity to interact to influence employee tendencies to engage in creative processes. Formally, we propose:

Hypothesis 5. Leader encouragement of creativity strengthens the relationship between psychological empowerment and creative process engagement.

Intrinsic Motivation, Creative Process Engagement, and Creativity

Amabile (1983) suggested that an individual's intrinsic task motivation plays an important role in determining behaviors that may result in creative outcomes. This is because intrinsic motivation "makes the difference between what an individual *can* do and what an individual *will* do" (Amabile, 1988: 133). As we indicated earlier, the degree of engagement in the creative process varies. If an individual pays little attention to a problem and chooses to minimally engage in its resolution, solutions may not be creative and useful. On the other hand, creative solutions may be generated when an individual devotes substantial attention to a problem and chooses to fully engage in the creative process—that is, he or she fully identifies the problem from various perspectives; gathers diverse, but relevant, information; and creates a variety of alternatives. Simon (1967) indicated that the primary function of intrinsic motivation is the control of attention. When individuals are intrinsically involved in their work, they are more likely to devote all of their attention to the problems they encoun-

ter. Such attention directs people to engage in a creative process through self-regulation (Kanfer, 1990). Consequently, intrinsic motivation influences the extent to which an individual will persist in carrying out the creative process (Shalley, 1995; Shalley et al., 2000). Stated formally:

Hypothesis 6. Intrinsic motivation is positively related to creative process engagement.

As mentioned previously, for a creative response to emerge, an individual must engage in creative activities such as problem identification, environmental scanning, data gathering, unconscious mental activity, solution generation and evaluation, and solution implementation (Shalley, 1991; Simon, 1966). This creative process “determine[s] the flexibility with which cognitive pathways are explored, the attention given to particular aspects of the task, and the extent to which a particular pathway is followed in pursuit of a solution” (Amabile, 1996: 95). If cognitive processing is interrupted, then critical information will not have been accessed or used in problem solving, which results in low creativity as an outcome (Shalley, 1995). Accordingly:

Hypothesis 7. Creative process engagement is positively related to employee creativity.

Finally, considerable evidence indicates that intrinsic task motivation is critical to creativity in organizations, and research has reported positive associations between intrinsic motivation and employee creativity on a task (e.g., Amabile, 1979, 1987, 1996; Taggar, 2002). Accordingly, we hypothesize a direct impact of intrinsic motivation on employee creativity as an outcome:

Hypothesis 8. Intrinsic motivation is positively related to employee creativity.

METHODS

Research Setting and Participants

This study was conducted in a major information technology (IT) company headquartered in the People's Republic of China (PRC). We used a web-based survey tool to collect the data. The entire survey was translated from English into Chinese and then back-translated into English by two independent bilingual individuals to ensure equivalency of meaning (Brislin, 1980).

Participants were professional-level employees, such as software engineers and new product developers, whose work required substantial creativity in order to be effective, and their respective supervisors. Using contact information obtained from the

company's human resources (HR) department, we sent an e-mail, along with an URL survey link, to 670 professional employees. The employees also received an e-mail from the vice president of the company supporting the study and encouraging participation. The 498 usable employee survey responses received constituted a 74.3 percent response rate. Upon receipt of employee responses, we contacted the 219 relevant direct supervisors. We received useful responses from 164 direct supervisors, for a 74.9 percent response rate. Finally, we were able to match 367 usable responses from both direct supervisors and employees. The number of employees evaluated by each supervisor varied from one to six, with most supervisors rating two or three employees.

Participants comprising the final sample worked in one of three types of jobs: R&D (48%), strategic marketing (43%), and functional professions (9%). The average age of the participants was 30.4 years. The average organizational tenure was 3.62 years. Among the 367 respondents, 63.2 percent were male; 68 percent held bachelor's degrees, and 32 percent had graduate degrees.

Measures

Unless otherwise indicated, all the variables were measured by participant responses to questions on a five-point Likert-type scale ranging from “strongly disagree” to “strongly agree.” The specific measures are described below, along with the results of calculation of Cronbach alpha coefficients for the various measures. When a measure is described as having dimensions, the dimensions (items averaged) were used as indicators for their construct in structural equation modeling (described under “Analysis”). Otherwise, items were averaged into an overall scale score. Measures were completed by employees, except for the creativity measure, which was completed by supervisors. The Appendix gives the texts of the items for our primary measures.

Empowering leadership. For empowering leadership, we used Ahearne et al.'s (2005) measure. This 12-item measure has multi-item subscales corresponding to four dimensions: (1) enhancing the meaningfulness of work, (2) fostering participation in decision making, (3) expressing confidence in high performance, and (4) providing autonomy from bureaucratic constraints (α 's = .89, .86, .85, and .79, respectively). The fit indexes for four first-order factors (the four dimensions) plus one second-order factor fell within an acceptable range ($\chi^2[50] = 153.87$, $p \leq .001$; CFI = .95, GFI = .93, SRMR = .07, RMSEA = .08; see “Analysis” for

interpretation of abbreviations), supporting the notion that the dimensions are distinct, but also collectively reflective of the overall construct.²

Psychological empowerment. Psychological empowerment was measured with Spreitzer's (1995) 12-item scale as manifested in four dimensions of 3 items each: meaning, competence, self-determination, and impact (α 's = .86, .77, .81, and .87, respectively). The fit indexes for four first-order factors plus one second-order factor fell within an acceptable range ($\chi^2[50] = 127.40$, $p \leq .001$; CFI = .97, GFI = .94, SRMR = .04, RMSEA = .07), suggesting that the dimensions reflected the overall construct.

Empowerment role identity. A four-item scale ($\alpha = .77$) to measure empowerment role identity was adapted from Callero's (1985) donor role identity measure and Farmer et al.'s (2003) creative role identity measure.

Creative process engagement. An 11-item scale was developed for this study on the basis of the conceptual work of Amabile (1983) and Reiter-Palmon and Illies (2004). Prior to using the measure, we had six experts (doctoral students and doctorate holders) independently review the items and sort them according to our definitions of the three intended dimensions. All allocated the items to their intended dimensions (α 's = .77, .77, and .81) and judged them to be reasonable indicators. The fit indexes for three first-order factors plus one second-order factor fell within an acceptable range ($\chi^2[41] = 93.42$, $p \leq .001$; CFI = .97, GFI = .96, SRMR = .04, RMSEA = .06). Respondents answered on a five-point scale ranging from "never" to "very frequently."

Intrinsic motivation. Employee intrinsic motivation at work was measured with three items ($\alpha = .82$) adapted from the work of Amabile (1985) and Tierney et al. (1999).

Leader encouragement of creativity. To capture the extent of leader encouragement of creativity, a

six-item scale ($\alpha = .90$) was adapted from Scott and Bruce (1994) for this study.

Creativity. Employee creativity was measured with a 13-item creativity scale ($\alpha = .91$) developed by Zhou and George (2001) and was completed by supervisors. Respondents answered on a five-point scale ranging from "not at all characteristic" to "very characteristic."

Control variables. We controlled for five demographic variables that have been found to be significantly related to creativity (e.g., George & Zhou, 2001; Shalley et al., 2004). Age was measured in years. Gender was measured as a dichotomous variable coded as 1 for male and 0 for female. Company tenure was measured as the number of years that an employee had been in the company. Education was measured as the number of years of post high-school education. Job type was measured as a dichotomous dummy variable coded 1 for IT participants (e.g., employees from the R&D division) and 0 for non-IT participants (e.g., employees from the strategic marketing division and functional divisions).

We also controlled for job characteristics, as they have long been considered an important contributor to employee creativity (West & Farr, 1990), given that enriched jobs increase employees' enthusiasm for their work, which fosters creativity (Oldham & Cummings, 1996; Shalley et al., 2004; Tierney & Farmer, 2002, 2004). We used a six-item scale based on Hackman and Oldham (1974) and Idaszak and Drasgow (1987) and adapted from Piccolo and Colquitt (2006) to measure core job characteristics on three dimensions—task variety, task identity, and task significance—as they represent the critical psychological states likely to influence employee intrinsic motivation and job performance. Respondents answered on a five-point scale ranging from "very inaccurate" to "very accurate." We treated the three dimensions of job characteristics (α 's = .68, .84, and .71) as separate indicators of this construct.

Analysis

Structural equation modeling (SEM) with EQS 6.1 (Bentler, 2005) was used to examine the hypothesized model. The advantage of SEM is that it offers a simultaneous test of an entire system of variables in a hypothesized model and thus enables assessment of the extent to which the model is consistent with the data (Byrne, 1994).

In this study, we adopted Anderson and Gerbing's (1988) comprehensive, two-step analytical strategy to test the hypothesized model depicted in Figure 1. According to this strategy, the measure-

² As further evidence that it is reasonable to conceptualize the leadership dimensions as reflective, rather than formative, we note the correlations among the dimensions were substantial (Jarvis, Mackenzie, & Podsakoff, 2003). The correlations between the enhancing meaningfulness dimension and fostering participation in decision making, expressing confidence in high performance, and providing autonomy from bureaucratic constraints dimensions were .64, .57, and .59, respectively. Correlations between the participation dimension and the confidence and autonomy dimensions were .53 and .59, respectively. Finally, the correlation between the confidence and autonomy dimensions was .62. All were significant at $p \leq .001$.

ment model was first confirmed using confirmatory factor analysis (CFA), and we then performed SEM based on the measurement model to estimate the fit of the hypothesized model to the data. To gauge the model fit, chi-square (χ^2) values are reported as the index of absolute fit, which assesses the extent to which the covariances estimated in the model match the covariances in the measured variables (Kline, 1998). In addition, we also report the comparative fit index (CFI; Bentler, 1990), Jöreskog-Sörbom goodness-of-fit index (GFI), the standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA; Steiger, 1990) to gauge model fit. These indexes indicate the extent to which a research model provides an improved overall fit relative to a null model or independence model in which the correlations among observed variables are assumed to be zero. The CFI and GFI have been considered the best approximations of the population value for a single model, with values greater than or equal to .90 considered indicative of good fit (Medsker, Williams, & Holahan, 1994). The SRMR is a standardized summary of the average covariance residuals; a favorable value is less than .10 (Kline, 1998). The RMSEA is a measure of the average standardized residual per degree of freedom; a favorable value is less than or equal to .08, and values less than or equal to .10 are considered "fair" (Browne & Cudeck, 1989).

Prior to testing the measurement and structural models, we averaged items into dimensions for empowering leadership, psychological empowerment, and creative process engagement and treated the different dimensions as separate indicators of their corresponding construct in our SEM analyses. For all other variables in our model, we averaged the items into single indicators, except for the job characteristics control variable, which we also operationalized at the dimension level. To adjust for measurement error when using a single indicator for a latent variable, we fixed the loading of the variable on its respective factor at one and fixed the measurement error term by the variance multiplied by one minus the reliability.

Because the majority of supervisors in our sample evaluated the creativity of multiple employees, nonindependence of observations was a possibility (that is, effects related to a supervisor rather than to a rated employee). A one-way analysis of variance (ANOVA) with creativity as the dependent variable indicated no systematic differences in the ratings of employees on creativity that were attributable to differences in supervisor rating patterns rather than differences in employee creativity ($F = .98, p = .56$). In addition, a one-way ANOVA with empow-

ering leadership as the dependent variable indicated, as expected, that between-group variance was not greater than within-group variance ($F = .95, p = .62$), thus supporting our conceptualization of the model at the individual level. We hence proceeded to analyze our model using SEM and hierarchical regression analyses.

Hierarchical multiple regression was used to examine the role of empowerment role identity as a moderator of the relationship between empowering leadership and psychological empowerment and the role of leader encouragement of creativity as a moderator of the relationship between psychological empowerment and creative process engagement. Hierarchical regression is one of the most useful tools for testing interaction effects because it allows a researcher to base variables' order of entry on their causal priority (Cohen & Cohen, 1983). All interaction variables were mean-centered to reduce multicollinearity (Aiken & West, 1991).

RESULTS

Table 1 provides the descriptive statistics, correlations, and scale reliabilities for the variables in the study. Because several of our constructs were conceptually related and could be expected to be associated in a substantive way, we conducted additional analyses to establish the discriminant validity of our measures. First, we performed second-order CFAs for empowering leadership and psychological empowerment in which a two-factor model with individual variables loaded on their first-order factors (the dimensions) and the first-order factors loaded on their appropriate second-order factors (in this case, four dimensions for empowering leadership and four dimensions for psychological empowerment) was compared with a second-order one-factor model in which all first-order factors (representing all eight dimensions) were loaded on one second-order factor. The results indicated that the second-order two-factor model provided a significantly better fit than the second-order one-factor model ($\Delta\chi^2[3] = 759.23, p < .001$), supporting consideration of empowering leadership and psychological empowerment as two distinct constructs. Next, we conducted similar analyses for creative process engagement and intrinsic motivation, which indicated that the second-order two-factor model provided a significantly better fit than the second-order one-factor model ($\Delta\chi^2[1] = 83.42, p < .001$), supporting consideration of creative process engagement and intrinsic motivation as separate constructs. Finally, CFAs involving empowering leadership and leader encouragement of creativity indicated that the sec-

TABLE 1
Descriptive Statistics, Correlations, and Reliabilities^a

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Creativity	3.72	0.46	(.91)												
2. Age	30.47	4.75	.02												
3. Gender	0.63	0.48	.20**	.09											
4. Job tenure	3.62	2.88	-.03	.58**	-.02										
5. Education	4.26	1.27	.04	.17**	.06	.03									
6. Job type	0.54	0.49	.08	-.05	.14**	-.13*	.24**								
7. Job characteristics	3.58	0.44	.35**	.09	.17**	.02	.05	.04	(.71)						
8. Empowering leadership	3.67	0.58	.24**	-.07	.08	-.03	-.05	.15**	.48**	(.92)					
9. Psychological empowerment	3.74	0.42	.37**	.05	.14**	.06	-.02	.14**	.61**	.59**	(.82)				
10. Creative process	3.92	0.43	.70**	.03	.18**	-.07	.05	.02	.35**	.24**	.37**	(.88)			
11. Intrinsic motivation	3.94	0.55	.66**	.05	.11*	.04	.03	-.01	.26**	.20**	.29**	.65**	(.82)		
12. Empowerment role identity	3.83	0.52	.23**	.01	.06	-.00	-.02	.11*	.24**	.35**	.40**	.24**	.23**	(.77)	
13. Leader encouragement	3.68	0.63	.25**	-.14**	.06	-.09	-.11*	.13*	.40**	.69**	.44*	.18**	.20**	.30**	(.90)

^a *n* = 367. Internal reliabilities (alpha coefficients) for the overall constructs are given in parentheses on the diagonal.

* *p* ≤ .05

** *p* ≤ .01

ond-order two-factor model provided a significantly better fit than the second-order one-factor model ($\Delta\chi^2[1] = 77.45, p < .001$), supporting the distinctiveness of these two constructs. Thus, we proceeded with SEM analyses.

Measurement Model

The measurement model results indicated a good fit to the data ($\chi^2[122] = 463.60, p \leq .001$; CFI = .98, GFI = .90, SRMR = .06, RMSEA = .07). They provided evidence that further examination of the structural model was justified. Although the chi-square test was statistically significant, this statistic is well know to be sensitive to sample size and may be significant even when the differences between

observed and model-implied covariances are relatively small (Kline, 1998). Thus, we report multiple indexes in assessing model fit, as generally suggested by SEM scholars (e.g., Bollen, 1989; Schumacker & Lomax, 2004) and as outlined earlier.

Structural Model

Structural modeling results suggested that the hypothesized model fit the data well ($\chi^2[169] = 626.80, p \leq .001$; CFI = .97, GFI = .88, SRMR = .07, RMSEA = .08). Table 2 summarizes all the model fit indexes. Figure 2 presents the overall structural model with path coefficients.

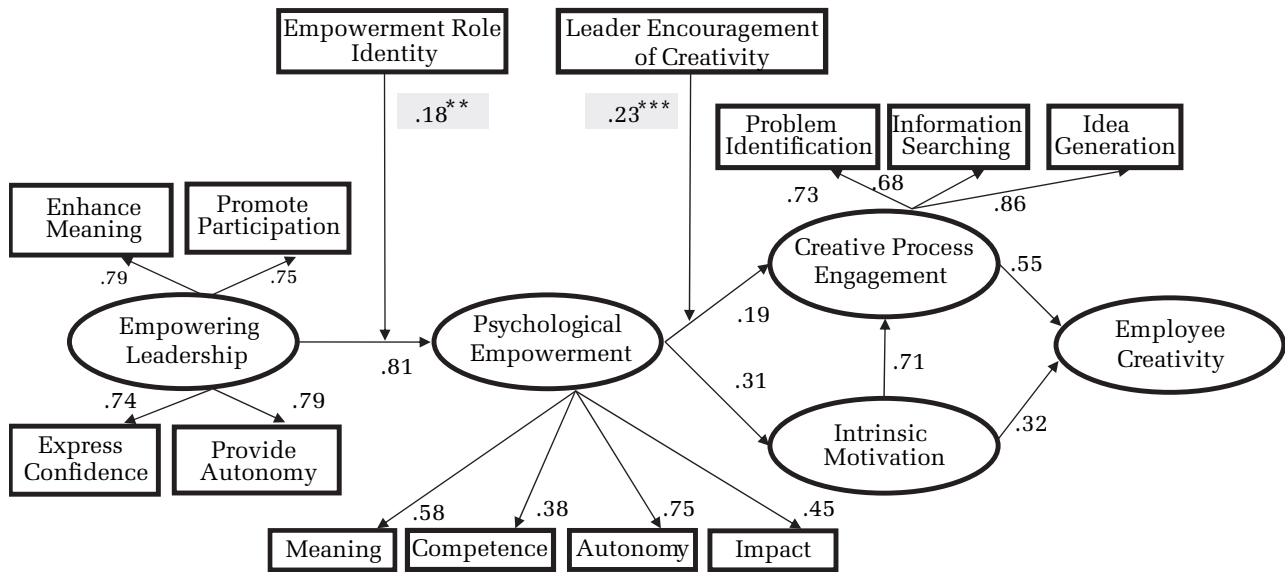
Hypothesis 1 states that empowering leadership is positively related to psychological empower-

TABLE 2
Summary of Model Fit Indexes^a

Model Test	χ^2	<i>df</i>	CFI	GFI	SRMR	RMSEA
1. Independence model	12,068,425	217				
2. Measurement model	463.60	122	.98	.90	.06	.07
3. Hypothesized model	626.80	169	.97	.88	.07	.08
4. Alternative model 1: Direct path from empowering leadership to intrinsic motivation ($\beta = .16, p > .05$)	626.15	168	.95	.87	.08	.09
5. Alternative model 2: Direct path from empowering leadership to creative process engagement ($\beta = .13, p > .05$)	625.28	168	.95	.87	.08	.09
6. Alternative model 3: Direct path from empowering leadership to employee creativity ($\beta = .00, p > .05$)	626.82	168	.95	.87	.08	.09
7. Alternative model 4: Remove direct path from intrinsic motivation to employee creativity	640.96	170	.97	.87	.08	.08
8. Alternative model 5: Reverse link between creative process engagement and intrinsic motivation	626.76	169	.95	.87	.12	.09

^a χ^2 -values for the measurement and structural models are significant at *p* ≤ .001.

FIGURE 2
Structural Equation Modeling with Moderation Results^a



^a $n = 367$. All paths in structural model analysis are significant at $p < .05$. Control variables are not shown for ease of presentation.
 ** $p \leq .01$
 *** $p \leq .001$

ment. Our results supported this view ($\beta = .81, p < .05$). Hypothesis 3, which states that psychological empowerment is positively related to intrinsic motivation, was also supported ($\beta = .31, p < .05$). Similarly, Hypothesis 4, which states that psychological empowerment is positively related to creative process engagement, received support as well ($\beta = .19, p < .05$). Hypothesis 6 says that intrinsic motivation is positively related to creative process engagement. Our results supported this hypothesis ($\beta = .71, p < .05$). Finally, results support the Hypothesis 7 contention that creative process engagement is positively related to employee creativity ($\beta = .55, p < .05$), as well as the Hypothesis 8 prediction that intrinsic motivation is also positively related to employee creativity ($\beta = .32, p < .05$).

In view of Anderson and Gerbing's (1988) suggestions, we also examined five alternative models that we believed were less likely to fit the data but were nevertheless plausible on the basis of theoretical arguments. As discussed earlier, an empowering leader provides a follower with autonomy, expresses confidence in his or her abilities, and maps out the significance of the follower's job, all of which may help directly enhance the employee's intrinsic motivation. Thus, in the first alternative model, we tested a direct effect of empowering leadership on an employee's intrinsic motivation by adding a direct path from empowering leadership to intrinsic motivation. This model provided

an adequate fit to the data but was not significantly better than the hypothesized model ($\Delta\chi^2[1] = 1.65, n.s.$), and the direct path from empowering leadership to intrinsic motivation was not significant. For fit indexes and the path coefficient, see Table 2.

A case could also be made that empowering leaders directly influence employee tendencies to engage in creative process, because an empowering leader tends to help a follower gain confidence, emphasize the importance of his or her work, and provide freedom to carry out the work. As a result, an employee may become more involved in his or her job by engaging in processes likely to lead to creative outcomes. Therefore, in the second alternative model, we added a direct path from empowering leadership to creative process engagement. This model provided an adequate fit to the data but was not significantly better than the hypothesized model ($\Delta\chi^2[1] = 1.01, n.s.$), and the direct path from empowering leadership to creative process engagement was not significant (Table 2).

Relying on similar arguments, we added a direct path from empowering leadership to employee creativity. This model provided an adequate fit to the data but was not significantly better than the hypothesized model ($\Delta\chi^2[1] = 0.03, n.s.$), and the direct path from empowering leadership to creative process engagement was not significant (Table 2).

We also considered two additional alternative models that focused on relationships among intrinsic motivation, creative process engagement, and

employee creativity. In one of these (alternative model 4), we tested the possibility that creative process engagement might fully mediate the relationship between intrinsic motivation and employee creativity by removing the direct link between intrinsic motivation and creativity. We found that this model had a significantly poorer fit than our hypothesized model ($\Delta\chi^2[1] = 14.15, p < .01$). Finally, in alternative model 5, we considered the possibility that creative process engagement might lead to intrinsic motivation instead of the other way around. This alternative was less plausible from a theoretical point of view, and, perhaps not surprisingly, this alternative had a relatively poor fit. We did not compute a chi-square change test for this model because it was not nested in the hypothesized model, and, hence, the test was inappropriate. Overall, the hypothesized model was more consistent with the data than any of the five alternative models.

To help elucidate the relationships among the various mediating variables in the hypothesized model, we conducted an effects decomposition to further understand the direct and indirect effects (Brown, 1997). Specific indirect effects represent the portion of the total effect that works through a single intervening variable (Fox, 1980). Our effects decomposition yielded a coefficient (β) of .22 ($p < .05$) for the indirect effect of psychological empowerment on creative process engagement through intrinsic motivation, which accounted for 53.92 percent of the total effect of psychological empowerment on creative process engagement. In addition, the coefficient for the indirect effect of intrinsic motivation on creativity through creative process engagement was .40 ($p < .05$), and the effect accounted for 55.79 percent of the total effect of intrinsic motivation on creativity.

Hierarchical Multiple Regression Analysis

Table 3 summarizes the hierarchical multiple regression results. In keeping with Hypothesis 2, we found that empowerment role identity interacted significantly with empowering leadership to influence psychological empowerment ($\beta = .18, p < .01$). The plot, presented in Figure 3, suggests that, although a higher level of empowering leadership is associated with higher psychological empowerment, empowering leadership is likely to be even more effective in influencing psychological empowerment when an employee wants to be empowered (i.e., has high empowerment role identity). We further conducted a simple slopes test. Our results confirmed that empowering leadership has a stronger positive effect on employee psychological em-

powerment when an employee's empowerment role identity is high ($\beta = .58, t = 10.92, p < .001$) than when such empowerment role identity is low ($\beta = .43, t = 7.58, p < .001$). Thus, Hypothesis 2 was supported.

The argument of Hypothesis 5 is that leader encouragement of creativity interacts significantly with psychological empowerment to influence creative process engagement. The results supported this argument ($\beta = .23, p < .001$). The plot (see Figure 3) suggests that the impact of perceived leader encouragement of creativity on creative process engagement is higher when psychological empowerment is high than when it is low. Simple slopes tests confirmed that psychological empowerment had a stronger positive effect on creative process engagement when a leader's encouragement of creativity is perceived to be high ($\beta = .56, t = 8.69, p < .001$) than when a leader's encouragement of creativity is perceived to be low ($\beta = .16, t = 2.41, p < .05$). Thus, Hypothesis 5 was supported.³

DISCUSSION

Our research makes five distinct contributions. First, our overall contribution is that we have built and tested a conceptual model that uniquely integrates empowering leadership theory with important creativity theories. Although a number of studies have investigated relationships between leadership style (e.g., supportive vs. controlling leadership style, transformational leadership) and employee creativity (e.g., Amabile et al., 2004; Tierney & Farmer, 2002, 2004; Zhou & George, 2003), empowering leadership has been surprisingly absent from consideration. Yet, as we have argued and uniquely modeled, there are strong theoretical reasons to expect empowering leadership to be well positioned to influence fundamentals underlying creative outcomes, a contention that we have supported empirically here. Our results support suggestions by creativity scholars that leadership approaches ad-

³ A structural equation model run with the two interaction terms as multiplicative terms, as suggested by Ping (1998), produced results similar to those for the hypothesized structural model depicted in Figure 2 (interaction of empowering leadership and empowerment role identity influencing psychological empowerment, $\beta = .15, p < .05$; interaction of psychological empowerment and leader encouragement of creativity influencing creative process engagement, $\beta = .20, p < .05$). The fit remained in the acceptable range ($\chi^2[210] = 811.11, p \leq .001$; CFI = .97, GFI = .85, SRMR = .08, RMSEA = .09).

TABLE 3
Results of Hierarchical Regression Analysis^a

(a) Moderating Effects of Empowerment Role Identity on the Empowering Leadership–Psychological Empowerment Relationship^b

Variables	Model 1		Model 2		Model 3	
Age	-.09	(.03)	-.03	(.03)	-.04	(.03)
Gender	.03	(.04)	.03	(.03)	.03	(.03)
Job tenure	.10	(.03)	.07	(.03)	.09	(.03)
Education	.01	(.03)	.01	(.03)	.02	(.03)
Job type	-.11*	(.04)	-.07	(.03)	-.06	(.03)
Job characteristics	.60***	(.04)	.42***	(.05)	.41***	(.05)
Empowering leadership			.38***	(.03)	.38***	(.03)
Empowerment role identity			-.01	(.04)	-.02	(.04)
Empowering leadership × role identity					.18**	(.04)
ΔR^2			.11		.01	
F for ΔR^2			37.01***		4.14*	
R^2	.38		.49		.49	
F	36.82***		42.39***		38.47***	

(b) Moderating Effects of Leader Encouragement of Creativity on the Psychological Empowerment–Creative Process Engagement Relationship^c

Variables	Model 1		Model 2		Model 3	
Age	.41	(.04)	.43	(.03)	.44	(.03)
Gender	.12**	(.05)	.12*	(.04)	.12**	(.04)
Job tenure	-.42	(.04)	-.45	(.04)	-.47	(.03)
Education	-.10	(.04)	-.10	(.04)	-.12	(.04)
Job type	.00	(.04)	.03	(.04)	.05	(.04)
Job characteristics	.33***	(.05)	.18**	(.06)	.15*	(.06)
Psychological empowerment			.26***	(.07)	.27***	(.06)
Leadership encouragement			-.02	(.04)	-.03	(.04)
Psychological empowerment × leadership encouragement					.23***	(.06)
ΔR^2			.04		.05	
F for ΔR^2			9.90***		24.15***	
R^2	.14		.18		.24	
F	9.90***		10.02***		12.17***	

^a $n = 367$. Values are standardized coefficients, with standard errors in parentheses.

^b Psychological empowerment is the dependent variable.

^c Creative process engagement is the dependent variable.

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

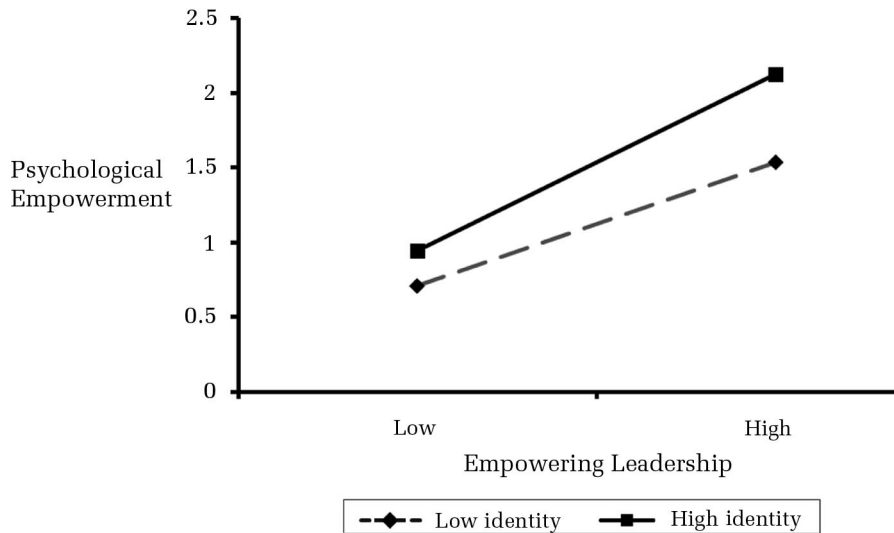
addressing the underpinnings of creativity may be effective means for encouraging creativity.

Second, our study contributes to both the leadership and the empowerment literatures by examining and confirming psychological empowerment as a mediating mechanism through which empowering leadership ultimately influences employee creativity (Zhang & Sims, 2005). Our findings are congruent with past research pointing to a positive association between empowering leadership and the self-determination aspect of psychological empowerment (Ahearne et al., 2005). However, there has been a need to empirically test the specific

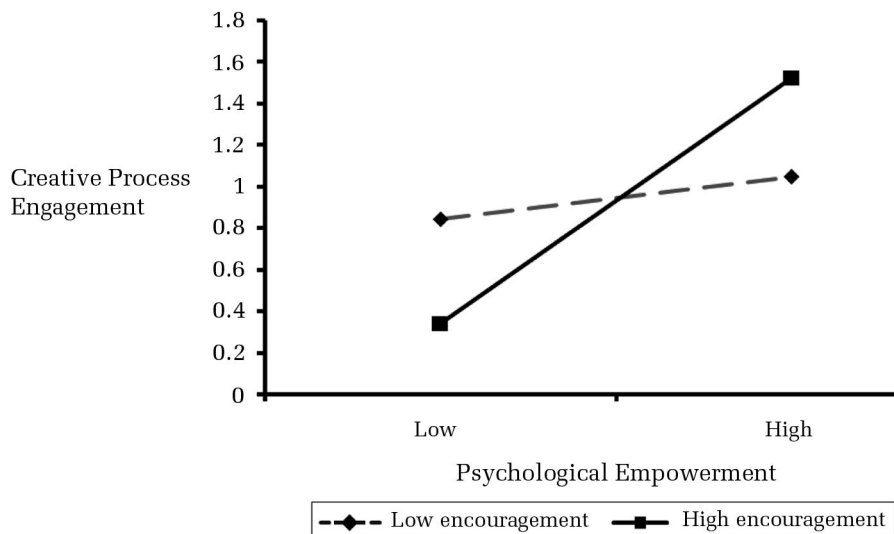
connection between empowering leadership and psychological empowerment. As Menon (2001) noted, empowering leadership is unlikely to have its anticipated impact unless followers actually experience psychological empowerment. Indeed, along these lines, we also introduced a promising moderating variable, empowerment role identity. Results of our study support the notion that empowering leadership is likely to have a stronger impact on psychological empowerment to the extent that an individual views empowerment as part of his or her employee role identity. Future research might assess means of influencing empow-

FIGURE 3
Moderating Effects

(a) Moderating Effects of Empowerment Role Identity on Empowering Leadership–Psychological Empowerment Relationship



(b) Moderating Effects of Leader Encouragement of Creativity on Psychological Empowerment–Creative Process Engagement Relationship



empowerment role identity, as it appears to be an important boundary condition with respect to the influence of empowering leadership on psychological empowerment. One possibility is knowledge and experience, which Ahearne et al. (2005) operationalized as a composite and termed “employee empowerment readiness” in their study of the influence of leadership empowerment on customer satisfaction and performance. Empowerment readiness as used by Ahearne et al. focused on sales representatives’ knowledge of their company and its products, as well as their experience in the

company and the sales field. It may be possible to adapt their approach to other venues, particularly those involving similar occupations and a single company.

Third, our study is unique in explicating the connection of psychological empowerment with not only intrinsic motivation, but also creative process engagement. More specifically, our study shows that, as expected, psychological empowerment was positively related to intrinsic motivation (Spreitzer, 1995, 1996; Thomas & Velthouse, 1990). Similarly, this study also built theoretical argu-

ments for and demonstrated a connection between psychological empowerment and creative process engagement. Although creativity researchers have suggested the need for greater understanding of the processes that an individual follows in producing creative outcomes, to our knowledge, no previous research has been an attempt to assess potential connections between psychological empowerment and employee engagement in an effective creative process.

Also as anticipated theoretically, our results confirmed that leader encouragement of creativity moderated the link between psychological empowerment and creative process engagement. These results not only support previous indications that an employee tends to be more creative when he or she understands the importance of doing so (e.g., Carson & Carson, 1993; Speller & Schumacher, 1975), but also demonstrate the important role that leaders can play in directing employee attention to effective processes for achieving creativity.

Fourth, we specifically contribute to the creativity literature by demonstrating the importance of creative process engagement in explaining employee creative outcomes. More specifically, several creativity theorists (e.g., Mainemelis, 2001; Mumford, 2000; Shalley et al., 2004) have pointed to the importance of allocating greater research attention to the creative process itself if understanding of how creative outcomes are achieved is to grow. In assessing this issue, Gilson and Shalley (2004) offered an initial look at what might influence an employee's engagement in effective creative process by focusing on the idea generation step in the process. The current study advances the creativity literature by addressing creative process engagement as a broader construct that includes the idea and alternative generation phase, but also encompasses the other two phases of creative idea production—the problem identification phase and the information searching and encoding phase (Amabile, 1983; Mumford, 2001; Mumford & Connelly, 1991; Reiter-Palmon & Illies, 2004).

Moreover, we demonstrate the important mediating role of creative process engagement for creativity with respect to both psychological empowerment and intrinsic motivation itself. Our results indicate that part of the impact of psychological empowerment on creativity stems from its impact on creative process engagement directly and also indirectly through intrinsic motivation. Thus, our findings support contentions (Mumford, 2000; Shalley et al., 2004) that further research in the area of creative process engagement is warranted. A promising direction for the future research would be to further examine the nature of the three cre-

ative processes. A finer-grained investigation of the three aspects of creative process engagement is a logical next step.

Finally, this study also demonstrates mediation by intrinsic motivation between psychological empowerment and employee creativity directly and also indirectly, through its influence on creative process engagement. Our results show that intrinsic motivation operating through creative process engagement has an indirect effect on creative performance that is stronger than its direct effect on creative performance. This differential may help explain prior research that has not shown a direct effect for intrinsic motivation when considered with other potential influences (e.g., Shalley & Perry-Smith, 2001). Possibly intrinsic motivation is operating at times through intervening variables, such as engagement in creative processes. In light of this notion, we place intrinsic motivation in a more complex nomological net than is often the case, thus advancing understanding of its role, particularly in the context of empowering leadership. Future research might also explore the extent to which moderating factors, such as creative and/or supportive coworkers (Perry-Smith, 2008), may influence the extent to which psychological empowerment translates into intrinsic motivation.

In considering other areas for future research beyond those that we have mentioned, several studies (e.g., Farmer et al., 2003; Rodan & Galunic, 2004; Tierney & Farmer, 2002) have indicated that creativity is contingent on a variety of individual difference variables, such as creative self-efficacy, creative role identity, personality, knowledge, and skills. An interesting direction for future study might be to assess the extent to which these individual difference variables interact with various aspects of creative process engagement to influence creative outcomes. For instance, it is possible that an individual with high creative self-efficacy or a creativity-oriented personality (e.g., openness to experience, proactivity) may be more willing to persist through the various stages of the creative process in order to produce the needed novel and useful ideas. In the current study, our focus was on empowerment role identity as an important “upstream” moderator variable in our model linking empowering leadership with creativity. Thus, we also concentrated on what we theorized to be the most important intervening variables. Although Farmer et al. (2003) provided evidence that creative role identity may influence individual creativity, future research might address the extent to which creative role identity is still a factor after taking into consideration empowerment-related variables.

In targeting other areas of future research inter-

est, one is the extent to which training on creative processes might enhance the impact of psychological empowerment on the propensity to engage in such processes. Issues of rewards continue to be important, particularly suggestions that extrinsic rewards may have varying importance at different stages of the creative process, with intrinsic motivation being more important at earlier stages (Amabile, 1993; Durham & Bartol, 2000). Yet another area of interest is the extent to which empowering leadership behaviors over time might strengthen an employee's psychological empowerment, potentially leading the employee to accelerate the pace of creative idea production.

Although our research has focused on empowering leadership as a dyadic construct, evidence suggests that empowering leadership can also be operationalized at the team level (e.g., Srivastava, Bartol, & Locke, 2006). In fact, some research points to possibilities for multilevel models involving empowerment issues (e.g., Chen, Kirkman, Kanfer, Allen, & Rosen, 2007; Seibert, Silver, & Randolph, 2004), although none has directly focused on empowering leadership and creativity. Future research might address multilevel factors in situations in which there is a need for teams to be creative. Overall, there are many fruitful paths for future research seeking to develop a more comprehensive understanding of the connection between empowering leadership and employee creativity.

Like any study, this one is not without limitations. First, this study had a cross-sectional design. Although the use of structural equation modeling permitted a simultaneous test of the entire system of variables in the hypothesized model, the explanation of results should still be made with caution.

Second, data on many of the major constructs were collected with self-reports from employees, raising the possibility of same-source bias. Since these constructs (psychological empowerment, creative process engagement, and intrinsic motivation) address individuals' internal states, we would argue that it is logical to collect the data from participants themselves. A mitigating factor is that the rating of employee creativity was collected from managers.

Third, all data were collected within a single organization, which limits the observed variability and decreases external validity. Of course, conducting this study in a single organization did provide the advantage of controlling for potential organization-level confounding variables. Future research in multiple organizational settings may increase the generalizability of the findings to other types of employees and organizations.

Finally, the model, derived from Western theo-

ries, was tested in a Chinese organization. Although previous studies have shown consistent results for the relationships between leadership and performance across cultures (e.g., Chen & Farh, 1999; Hackett, Farh, Song, & Kapierre, 2003), to our knowledge there have been no prior empirical studies of the application of empowerment and creativity theories in a Chinese culture. Thus, this study provides initial support that Western empowerment and creativity theories can be applied to other cultural contexts (e.g., China). Future work in other cultures can help verify the generalizability of our findings.

Our theoretical model also has implications for managers. First of all, in encouraging employee creativity, leadership does matter. Specifically, our results suggest that empowering leadership has the capacity to positively influence employee psychological empowerment, an element of importance in affecting creative outcomes. However, managers are likely to find differences in the extent to which employees wish to be empowered—that is, identify with an employee role that includes empowerment. Hence, managers may find that their empowerment efforts are more successful in engendering cognitions of psychological empowerment in those who view empowerment as part of their role identities. Indeed, evidence suggests that managers do not attempt to empower all employees to the same degree, at least at a given point in time (Forrester, 2000; Yukl & Fu, 1999), a strategy supported by our empowerment role identity findings. One implication is that, when empowerment role identity is low, leaders may need to expend some time gradually increasing empowerment behaviors so as to encourage employees to begin to view empowerment as part of their role identities. Fortunately, role identity theory suggests that adding role identities is possible through such a process, particularly over time (Stryker, 1980).

Second, our results suggest that creativity gains may be boosted if an employee is willing to spend the time and effort necessary to thoroughly identify a problem, search for extensive information, and generate multiple ideas from different perspectives—that is, engage in an effective creative process. Fortunately, our findings also indicate that a leader can play an active role in encouraging such creative process engagement by elucidating to a follower the need for creative outcomes, spelling out what their organization values, and explaining the elements of an effective creative process, such as the one we have considered here. Training employees in creativity-relevant methods or processes is likely to enhance such efforts.

In conclusion, this study uniquely synthesizes

leadership theories, empowerment theories, and creativity theories to further build and test theory regarding the potential influence of empowering leadership on creativity. It also explicates the role of three mediating mechanisms: psychological empowerment, intrinsic motivation, and creative process engagement. Finally, it identifies two important boundary conditions: empowerment role identity and leader encouragement of creativity. In consequence, our theoretical model, which received empirical support, sets the stage for further research and theory progress in understanding how empowering leadership can increase creative outcomes in organizations.

REFERENCES

- Ahearne, M., Mathieu, J., & Rapp, A. 2005. To empower or not to empower your sales force? An empirical examination of the influence of leadership empowerment behavior on customer satisfaction and performance. *Journal of Applied Psychology*, 90: 945–955.
- Aiken, L. S., & West, S. G. 1991. *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Amabile, T. M. 1979. Effects of external evaluation on artistic creativity. *Journal of Personality and Social Psychology*, 37: 221–233.
- Amabile, T. M. 1983. The social psychology of creativity: A componential conceptualization. *Journal of Personality and Social Psychology*, 45: 357–376.
- Amabile, T. M. 1985. Motivation and creativity: Effects of motivational orientation on creative writers. *Journal of Personality and Social Psychology*, 48: 393–399.
- Amabile, T. M. 1987. The motivation to be creative. In S. Isaksen (Ed.), *Frontiers in creativity: Beyond the basics*: 223–254. Buffalo, NY: Bearly.
- Amabile, T. M. 1988. A model of creativity and innovation in organizations. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior*, vol. 10: 123–167. Greenwich, CT: JAI Press.
- Amabile, T. M. 1993. Motivational synergy: Toward new conceptualizations of intrinsic and extrinsic motivation in the workplace. *Human Resource Management Review*, 3: 185–201.
- Amabile, T. M. 1996. *Creativity in context*. Boulder, CO: Westview Press.
- Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. 1996. Assessing the work environment for creativity. *Academy of Management Journal*, 39: 1154–1184.
- Amabile, T. M., Schatzel, E. A., Moneta, G. B., & Kramer, S. J. 2004. Leader behaviors and the work environment for creativity: Perceived leader support. *Leadership Quarterly*, 15: 5–32.
- Anderson, J. C., & Gerbing, D. W. 1988. Structural equation modeling in practice: A review and recommended two step approach. *Psychological Bulletin*, 103: 411–423.
- Arnold, J. J., Arad, S., Rhoades, J. A., & Drasgow, F. 2000. The Empowering Leadership Questionnaire: The construction and validation of a new scale for measuring leader behaviors. *Journal of Organizational Behavior*, 21: 249–269.
- Bass, B. M. 1985. *Leadership and performance beyond expectation*. New York: Free Press.
- Basu, R., & Green, S. G. 1997. Leader-member exchange and transformational leadership: An empirical examination of innovative behaviors in leader-member dyads. *Journal of Applied Social Psychology*, 27: 477–499.
- Bentler, P. M. 1990. Comparative fit indexes in structural models. *Psychological Bulletin*, 107: 238–246.
- Bentler, P. M. 2005. *EQS for Window 6.1*. Encino, CA: Multivariate Software.
- Bollen, K. A. 1989. *Structural equations with latent variables*. Newbury Park, CA: Sage.
- Brislin, R. W. 1980. Translation and content analysis of oral and written material. In H. C. Triandis & J. W. Berry (Eds.), *Handbook of cross-cultural psychology*, vol. 2: 349–444. Boston: Allyn & Bacon.
- Brown, R. L. 1997. *Assessing specific meditational effects in complex theoretical models*. Working paper, University of Wisconsin–Madison.
- Browne, M. W., & Cudeck, R. 1989. Single sample cross-validation indices for covariance structures. *Multivariate Behavioral Research*, 24: 445–455.
- Burke, P. J. 1991. Identity processes and social stress. *American Sociological Review*, 56: 836–849.
- Burke, P. J., & Tully, J. C. 1977. The measurement of role identity. *Social Forces*, 55: 881–897.
- Byrne, B. M. 1994. *Structural equation modeling with EQS and EQS/Window: Basic concepts, applications, and programming*. Thousand Oaks, CA: Sage.
- Callero, P. L. 1985. Role-identity salience. *Social Psychology Quarterly*, 48: 201–215.
- Callero, P. L., Howard, J. A., & Piliavin, J. A. 1987. Helping behavior as role behavior: Disclosing social structure and history in the analysis of prosocial action. *Social Psychology Quarterly*, 50: 247–256.
- Carson, P. P., & Carson, K. D. 1993. Managing creativity enhancement through goal setting and feedback. *Journal of Creative Behavior*, 27: 36–45.
- Chen, G., & Farh, J. L. 1999. *The effectiveness of transactional and transformational leader behaviors in Chinese organizations: Evidence from Taiwan*. Paper presented at the annual meeting of the Academy of Management, Chicago.

- Chen, G., Kirkman, B. L., Kanfer, R., Allen, D., & Rosen, B. 2007. A multilevel study of leadership, empowerment, and performance in teams. *Journal of Applied Psychology*, 92: 331–346.
- Cohen, J., & Cohen, P. 1983. *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Conger, J. A., & Kanungo, R. N. 1988. The empowerment process: Integrating theory and practice. *Academy of Management Review*, 3: 471–482.
- Dansereau, F., Graen, G. B., & Haga, W. 1975. A vertical dyad linkage approach to leadership in formal organizations. *Organizational Behavior and Human Performance*, 13: 46–78.
- Deci, E. L., & Ryan, R. M. 1991. A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), *Nebraska symposium on motivation*, vol. 38: 237–288. Lincoln: University of Nebraska Press.
- Drazin, R., Glynn, M., & Kazanjian, R. 1999. Multilevel theorizing about creativity in organizations. *Academy of Management Review*, 24: 286–307.
- Durham, C. C., & Bartol, K. M. 2000. Pay for performance. In E. A. Locke (Ed.), *The Blackwell handbook of principles of organizational behavior*: 150–165. Oxford, U.K.: Blackwell.
- Farmer, S. M., Tierney, P., & Kung-Mcintyre, K. 2003. Employee creativity in Taiwan: An application of role identity theory. *Academy of Management Journal*, 46: 618–630.
- Ford, C. M. 2000. Creative developments in creativity theory. *Academy of Management Review*, 25: 284–289.
- Ford, R. C., & Fottler, M. D. 1995. Empowerment: A matter of degree. *Academy of Management Executive*, 9(3): 21–29.
- Forrester, R. 2000. Empowerment: Rejuvenating a potent idea. *Academy of Management Executive*, 14(3): 67–80.
- Fox, J. 1980. Effects analysis in structural equation models. *Sociological Methods and Research*, 9: 3–28.
- Gagne, M., Senecal, C. B., & Koestner, R. 1997. Proximal job characteristics, feelings of empowerment, and intrinsic motivation: A multidimensional model. *Journal of Applied Psychology*, 27: 1222–1240.
- George, J. M., & Zhou, J. 2001. When openness to experience and conscientiousness are related to creative behavior: An interactional approach. *Journal of Applied Psychology*, 86: 513–524.
- George, J. M., & Zhou, J. 2007. Dual tuning in a supportive context: Joint contributions of positive mood, negative mood, and supervisory behaviors to employee creativity. *Academy of Management Journal*, 50: 605–622.
- Gilson, L. L., & Shalley, C. E. 2004. A little creativity goes a long way: An examination of teams' engagement in creative processes. *Journal of Management*, 30: 453–470.
- Graen, G. B., & Uhl-Bien, M. 1995. Relationship-based approach to leadership: Development of leader-member exchange (LMX) theory of leadership over 25 years: Applying a multi-level multi-domain perspective. *Leadership Quarterly*, 6: 219–247.
- Hackett, R. D., Farh, J. L., Song, L. J., & Kapierre, L. M. 2003. LMX and organizational citizenship behavior: Examining the links within and across Western and Chinese samples. In G. Graen (Ed.), *Dealing with diversity* (volume in *LMX leadership: The series*): 219–263. Greenwich, CT: Information Age.
- Hackman, J. R., & Oldham, G. R. 1974. The Job Diagnostic Survey: An instrument for the diagnosis of jobs and the evaluation of job redesign projects. *Catalog of Selected Documents in Psychology*, 4: 148–149.
- Howell, J. M., & Avolio, B. J. 1993. Transformational leadership, transactional leadership, locus of control and support for innovation: Key predictors of consolidated-business-unit performance. *Journal of Applied Psychology*, 78: 891–902.
- Idaszak, J. R., & Drasgow, F. 1987. A revision of the Job Diagnostic Survey: Elimination of a measurement artifact. *Journal of Applied Psychology*, 72: 69–74.
- Jabri, M. 1991. The development of conceptually independent subscales in the measurement of modes of problem solving. *Educational and Psychological Measurement*, 51: 975–983.
- Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. 2003. A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of Consumer Research*, 30: 199–218.
- Jaussi, K. S., & Dionne, S. D. 2003. Leading for creativity: The role of unconventional leader behavior. *Leadership Quarterly*, 14: 475–498.
- Jung, D. I., Chow, C., & Wu, A. 2003. The role of transformational leadership in enhancing organizational innovation: Hypotheses and some preliminary findings. *Leadership Quarterly*, 14: 525–544.
- Kahai, S. S., Sosik, J. J., & Avolio, B. J. 2003. Effects of leadership style and problem structure on work group processes and outcomes in an electronic meeting system environment. *Personnel Psychology*, 50: 121–146.
- Kanfer, R. 1990. Motivation theory and organizational psychology. In M. D. Dunnette & L. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed.), vol. 1: 75–170. Palo Alto, CA: Consulting Psychologists Press.

- Keller, R. T. 1992. Transformational leadership and the performance of research and development project groups. *Journal of Management*, 18: 489–504.
- Keller, T., & Dansereau, F. 1995. Leadership and empowerment: A social exchange perspective, *Human Relations*, 48: 127–146.
- Kirkman, B. L., & Rosen, B. 1997. A model of work team empowerment. In R. W. Woodman & W. A. Pasmore (Eds.), *Research in organizational change and development*, vol. 10: 131–167. Greenwich, CT: JAI Press.
- Kirkman, B. L., & Rosen, B. 1999. Beyond self-management: Antecedents and consequences of team empowerment. *Academy of Management Journal*, 42: 58–74.
- Kirkman, B. L., & Shapiro, D. L. 1997. The impact of cultural values on employee resistance to teams: Toward a model of globalized self-managing work team effectiveness. *Academy of Management Review*, 22: 730–757.
- Kirkman, B. L., & Shapiro, D. L. 2001. The impact of cultural values on job satisfaction and organizational commitment in self-managing work teams: The mediating role of employee resistance. *Academy of Management Journal*, 44: 557–569.
- Kline, R. B. 1998. *Principles and practices of structural equation modeling*. New York: Guilford Press.
- Koestner, R., Ryan, R. M., Bernieri, R., & Holt, K. 1984. Setting limits in children's behavior: The differential effects of controlling versus informational styles on intrinsic motivation and creativity. *Journal of Personality*, 52: 233–248.
- Labianca, G., Gray, B., & Brass, D. J. 2000. A grounded model of organizational schema change during empowerment. *Organization Science*, 11: 235–257.
- Leana, C. R. 1986. Predictors and consequences of delegation. *Academy of Management Journal*, 29: 754–774.
- Madjar, N., Oldham, G. R., & Pratt, M. G. 2002. There's no place like home? The contributions of work and nonwork creativity support to employees' creative performance. *Academy of Management Journal*, 45: 757–767.
- Mainemelis, C. 2001. When the muse takes it all: A model for the experience of timelessness in organizations. *Academy of Management Review*, 26: 548–565.
- Manz, C. C., & Sims, H. P. 1987. Leading workers to lead themselves: The external leadership of self-managing work teams. *Administrative Science Quarterly*, 32: 106–129.
- Maynard, M. T., Mathieu, J. E., Marsh, W. M., & Ruddy, T. M. 2007. A multilevel investigation of the influence of employees' resistance to empowerment. *Human Performance*, 20: 147–171.
- McCall, G. J., & Simmons, J. L. 1966. *Identities and interactions*. New York: Free Press.
- Medsker, G. J., Williams, L. J., & Holahan, P. J. 1994. A review of current practices for evaluating causal models in organizational behavior and human resources management research. *Journal of Management*, 20: 439–464.
- Menon, S. T. 2001. Employee empowerment: An integrative psychological approach. *Applied Psychology: An International Review*, 50: 153–180.
- Mumford, M. D. 2000. Managing creative people: Strategies and tactics for innovation. *Human Resource Management Review*, 10: 313–351.
- Mumford, M. D. 2001. Something old, something new: Revisiting Guilford's conception of creative problem solving. *Creativity Research Journal*, 13: 267–276.
- Mumford, M. D., & Connelly, M. S. 1991. Leaders as creators: Leader performance and problem solving in ill-defined domain. *Leadership Quarterly*, 2: 289–315.
- Mumford, M. D., Scott, G. M., Gaddis, B. H., & Strange, J. M. 2002. Leading creative people: Orchestrating expertise and relationships. *Leadership Quarterly*, 13: 705–750.
- Oldham, G. R., & Cummings, A. 1996. Employee creativity: Personal and contextual factors at work. *Academy of Management Journal*, 39: 607–634.
- Pearce, C. L., Sims, H. P., Cox, J. F., Ball, G., Schnell, E., Smith, K. A., & Trevino, L. 2003. Transactors, transformers and beyond: A multi-method development of a theoretical typology of leadership. *Journal of Management Development*, 22(4): 273–307.
- Perry-Smith, J. E. 2006. Social yet creative: The role of social relationships in facilitating individual creativity. *Academy of Management Journal*, 49: 85–101.
- Perry-Smith, J. E. 2008. When being social facilitates creativity: Social networks and creativity within organizations. In J. Zhou & C. E. Shalley (Eds.), *Handbook of organizational creativity*: 3–31. New York: Taylor & Francis.
- Piccolo, R. F., & Colquitt, J. A. 2006. Transformational leadership and job behaviors: The mediating role of core job characteristics. *Academy of Management Journal*, 49: 327–340.
- Piliavin, J. A., Grube, J. A., & Callero, P. L. 2002. Role as resource for action in public service. *Journal of Social Issues*, 58: 469–485.
- Ping, Jr. R. A. 1998. EQS and LISREL examples using survey data. In R. E. Schumacker & G. A. Marcoulides (Eds.), *Interaction and nonlinear effects in structural equation modeling*: 63–100. Philadelphia: Erlbaum.
- Pinto, J. K., & Prescott, J. E. 1988. Variations in critical success factors over the stages in the project life cycle. *Journal of Management*, 14(1): 5–18.

- Reiter-Palmon, R., & Illies, J. J. 2004. Leadership and creativity: Understanding leadership from a creative problem solving perspective. *Leadership Quarterly*, 15: 55–77.
- Robert, C., Probst, T. M., Martocchio, J. J., Drasgow, F., & Lawler, J. J. 2000. Empowerment and continuous improvement in the United States, Mexico, Poland, and India: Predicting fit on the basis of the dimensions of power distance and individualism. *Journal of Applied Psychology*, 85: 643–658.
- Roden, S., & Galunic, C. 2004. More than network structure: How knowledge heterogeneity influences managerial performance and innovativeness. *Strategic Management Journal*, 25: 541–562.
- Runco, M. A. 1986. Maximal performance on divergent thinking tests by gifted, talented, and nongifted children. *Psychology in the Schools*, 23: 308–315.
- Schumacker, R. E., & Lomax, R. G. 2004. *A beginner's guide to structural equation modeling*. Mahwah, NJ: Erlbaum.
- Scott, S. G., & Bruce, R. A. 1994. Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, 37: 580–607.
- Seibert, S. E., Silver, S. R., & Randolph, W. A. 2004. Taking empowerment to the next level: A multiple-level model of empowerment, performance, and satisfaction. *Academy of Management Journal*, 47: 332–349.
- Shalley, C. E. 1991. Effects of productivity goals, creativity goals, and personal discretion on individual creativity. *Journal of Applied Psychology*, 76: 179–185.
- Shalley, C. E. 1995. Effects of coaction, expected evaluation, and goal setting on creativity and productivity. *Academy of Management Journal*, 38: 483–503.
- Shalley, C. E., & Gilson, L. L. 2004. What leaders need to know: A review of social and contextual factors that can foster or hinder creativity. *Leadership Quarterly*, 15: 33–53.
- Shalley, C. E., Gilson, L. L., & Blum, T. C. 2000. Matching creativity requirements and the work environment: Effects on satisfaction and intent to turnover. *Academy of Management Journal*, 43: 215–224.
- Shalley, C. E., & Perry-Smith, J. E. 2001. Effects of social-psychological factors on creative performance: The role of informational and controlling expected evaluation and modeling experience. *Organizational Behavior and Human Decision Processes*, 84: 1–22.
- Shalley, C. E., & Zhou, J. 2008. Organizational creativity research: A historical overview. In J. Zhou & C. E. Shalley (Eds.), *Handbook of organizational creativity*: 95–123. New York: Taylor and Francis.
- Shalley, C. E., Zhou, J., & Oldman, G. R. 2004. The effects of personal and contextual characteristics on creativity: Where should we go from here? *Journal of Management*, 30: 933–958.
- Shin, S., & Zhou, J. 2003. Transformational leadership, conservation, and creativity: Evidence from Korea. *Academy of Management Journal*, 46: 703–714.
- Shin, S., & Zhou, J. 2007. When is educational specialization heterogeneity related to creativity in research and development teams? Transformational leadership as a moderator. *Journal of Applied Psychology*, 92: 1709–1721.
- Simon, H. A. 1966. Scientific discovery and the psychology of problem solving. In R. G. Colodny (Ed.), *Mind and cosmos: Essays in contemporary science and philosophy*: 22–40. Pittsburgh: University of Pittsburgh Press.
- Simon, H. A. 1967. Motivational and emotional controls of cognition. *Psychological Review*, 74: 29–39.
- Sims, H. P., & Manz, C. C. 1996. *Company of heroes: Unleashing the power of self-leadership*. New York: Wiley.
- Sosik, J. J., Kahai, S. S., & Avolio, B. J. 1998. Transformational leadership and dimensions of creativity: Motivating idea generation in computer-mediated groups. *Creativity Research Journal*, 11: 111–122.
- Speller, K. G., & Schumacher, G. M. 1975. Age and set in creative test performance. *Psychological Reports*, 36: 447–450.
- Spreitzer, G. M. 1995. Individual empowerment in the workplace: Dimensions, measurement, validation. *Academy of Management Journal*, 38: 1442–1465.
- Spreitzer, G. M. 1996. Social structural characteristics of psychological empowerment. *Academy of Management Journal*, 39: 483–505.
- Srivastava, A., Bartol, K. M., & Locke, E. A. 2006. Empowering leadership in management teams: Effects on knowledge sharing, efficacy, and performance. *Academy of Management Journal*, 49: 1239–1251.
- Steiger, J. H. 1990. Structural model evaluation and modification: An interval estimation approach. *Multivariate Behavioral Research*, 25: 173–180.
- Stryker, S. 1980. *Symbolic interaction: A social structural version*. Menlo Park, CA: Benjamin/Cummings.
- Stryker, S., & Burke, P. J. 2000. The past, present, and future of an identity theory. *Social Psychology Quarterly*, 63: 284–297.
- Stryker, S., & Serpe, R. T. 1994. Identity salience and psychological centrality: Equivalent, overlapping, or complementary concepts? *Social Psychological Quarterly*, 57: 16–35.
- Taggar, S. 2002. Individual creativity and group ability to utilize individual creative resources: A multilevel model. *Academy of Management Journal*, 45: 315–330.

- Thomas, K. W., & Velthouse, B. A. 1990. Cognitive elements of empowerment: An "interpretive" model of intrinsic task motivation. *Academy of Management Review*, 15: 666–681.
- Tierney, P. 2008. Leadership and employee creativity. In J. Zhou & C. E. Shalley (Eds.), *Handbook of organizational creativity*: 95–123. New York: Taylor and Francis.
- Tierney, P., & Farmer, S. M. 2002. Creative self-efficacy: Potential antecedents and relationship to creative performance. *Academy of Management Journal*, 45: 1137–1148.
- Tierney, P., & Farmer, S. M. 2004. The Pygmalion process and employee creativity. *Journal of Management*, 30: 413–432.
- Tierney, P., Farmer, S. M., & Graen, G. B. 1999. An examination of leadership and employee creativity: The relevance of traits and relationships. *Personnel Psychology*, 52: 591–620.
- Utman, C. H. 1997. Performance effects of motivational state: A meta-analysis. *Personality and Social Psychology Review*, 1: 170–182.
- West, M. A., & Farr, J. L. 1990. Innovation at work. In M. West & J. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strategies*: 3–13. Chichester, U.K.: Wiley.
- Wyer, R. S., & Srull, T. K. 1980. The processing of social stimulus information: A conceptual integration. In R. Hastie, T. M. Ostrom, E. B. Ebbeson, R. S. Wyer, D. L. Hamilton, & D. E. Carlston (Eds.), *Person memory: The cognitive basis of social perception*: 227–300. Hillsdale, NJ: Erlbaum.
- Yukl, G., & Fu, P. P. 1999. Determinants of delegation and consultation by managers. *Journal of Organizational Behavior*, 20: 219–232.
- Zhang, X., & Sims, H. P., Jr. 2005. Leadership, collaborative capital, and innovation. In M. Beyerlein, S. Beyerlein, & F. Kennedy (Eds.), *Advances in interdisciplinary studies of work teams*, vol. 14: 211–236. Greenwich, CT: JAI Press.
- Zhou, J. 1998. Feedback valence, feedback style, task autonomy, and achievement orientation: Interactive effects on creative performance. *Journal of Applied Psychology*, 83: 261–276.
- Zhou, J., & George, J. M. 2001. When job dissatisfaction leads to creativity: Encouraging the expression of voice. *Academy of Management Journal*, 44: 682–696.
- Zhou, J., & George, J. M. 2003. Awakening employee creativity: The role of leader emotional intelligence. *Leadership Quarterly*, 14: 545–568.
- Zhou, J., & Shalley, C. E. 2003. Research on employee creativity: A critical review and directions for future research. In J. Martocchio (Ed.), *Research in personnel and human resource management*: 165–217. Oxford, U.K.: Elsevier.

APPENDIX

Items for Primary Measures

Empowering Leadership (from Ahearne, Mathieu, and Rapp [2005])

Enhancing the meaningfulness of work:

1. My manager helps me understand how my objectives and goals relate to that of the company.
2. My manager helps me understand the importance of my work to the overall effectiveness of the company.
3. My manager helps me understand how my job fits into the bigger picture.

Fostering participation in decision making:

4. My manager makes many decision together with me.
5. My manager often consults me on strategic decisions.
6. My manager solicits my opinion on decisions that may affect me.

Expressing confidence in high performance:

7. My manager believes that I can handle demanding tasks.
8. My manager believes in my ability to improve even when I make mistakes.
9. My manager expresses confidence in my ability to perform at a high level.

Providing autonomy from bureaucratic constraints:

10. My manager allows me to do my job my way.
11. My manager makes it more efficient for me to do my job by keeping the rules and regulations simple.
12. My manager allows me to make important decisions quickly to satisfy customer needs.

Psychological Empowerment (from Spreitzer [1995])

Meaning items:

1. The work I do is very important to me.
2. My work activities are personally meaningful to me.
3. The work I do is meaningful to me.

Competence items:

4. I am confident about my ability to do my jobs.
5. I am self-assured about my capabilities to perform my work activities.
6. I have mastered the skills necessary for my job.

Self-determination items:

7. I have significant autonomy in determining how I do my job.
8. I can decide on my own how to go about doing my work.
9. I have considerable opportunity for independence and freedom in how I do my job.

Impact items:

10. My impact on what happens in my department is large.
11. I have a great deal of control over what happens in my department.

12. I have significant influence over what happens in my department.

Creative Process Engagement (developed for the study drawing on Amabile [1983], Perry-Smith [2006], and Reiter-Palmon and Illies [2004])

Respondents answered the following question: "In your job, to what extent do you engage in the following actions when seeking to accomplish an assignment or solve a problem?" (1 = "never," 2 = "rarely," 3 = "occasionally," 4 = "frequently," 5 = "very frequently").

Problem identification:

1. I spend considerable time trying to understand the nature of the problem.
2. I think about the problem from multiple perspectives.
3. I decompose a difficult problem/assignment into parts to obtain greater understanding.

Information searching and encoding:

4. I consult a wide variety of information.
5. I search for information from multiple sources (e.g., personal memories, others' experience, documentation, Internet, etc.).
6. I retain large amounts of detailed information in my area of expertise for future use.

Idea generation:

7. I consider diverse sources of information in generating new ideas.
8. I look for connections with solutions used in seeming diverse areas.
9. I generate a significant number of alternatives to the same problem before I choose the final solution.
10. I try to devise potential solutions that move away from established ways of doing things.
11. I spend considerable time shifting through information that helps to generate new ideas.

Intrinsic Motivation (adapted from Amabile [1985], Tierney, Farmer, and Graen [1999])

1. I enjoy finding solutions to complex problems.
2. I enjoy creating new procedures for work tasks.
3. I enjoy improving existing processes or products.

Creativity (from Zhou and George [2001])

Respondents answered the following question: "To what extent do you think the following statement is characteristic?" (1 = "not at all characteristic," 2 = "a little bit," 3 = "neutral," 4 = "characteristic," 5 = "very characteristic").

This employee:

1. Suggests new ways to achieve goals or objectives.
2. Comes up with new and practical ideas to improve performance.
3. Searches out new technologies, processes, techniques, and/or product ideas.
4. Suggests new ways to increase quality.
5. Is a good source of creative ideas.

6. Is not afraid to take risks.
7. Promotes and champions ideas to others.
8. Exhibits creativity on the job when given the opportunity to.
9. Develops adequate plans and schedules for the implementation of new ideas.
10. Often has new and innovative ideas.
11. Comes up with creative solutions to problems.
12. Often has a fresh approach to problems.
13. Suggests new ways of performing work tasks.

Empowerment Role Identity (adapted from Callero [1985], Farmer, Tierney, and Kung-Mcintyre [2003])

1. I often think about having greater control over my job.
2. I have a clear concept of myself as an employee who wants to have greater decision-making power.
3. Having certain degree of power and discretion is an important part of my identity.
4. I would feel a loss if I have no discretion at all in my job.

Leader Encouragement of Creativity (developed for the study drawing on Scott and Bruce [1994])

1. My manager encourages and emphasizes or reinforces creativity by employees.
2. My manager respects employees' ability to function creatively.
3. My manager allows employees to try to solve the same problems in different ways.
4. My manager expects employees to deal with problems in different ways.
5. My manager will reward employees who are creative in doing their job.
6. My manager will publicly recognize those who are creative.



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