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# TRANSFORMATIONAL LEADERSHIP'S ROLE IN PROMOTING CORPORATE ENTREPRENEURSHIP: EXAMINING THE CEO-TMT INTERFACE

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Research about transformational CEOs' impact on firm-level outcomes, particularly corporate entrepreneurship, has been equivocal, partially because the underlying mechanisms remain largely unexplored. Given that the individuals most closely influenced by a firm's CEO are its top management team (TMT) members, we focus on the CEO-TMT interface as a salient intervening mechanism. We posit that transformational CEOs influence TMTs' behavioral integration, risk propensity, decentralization of responsibilities, and long-term compensation and that these TMT characteristics impact corporate entrepreneurship. Data from 152 firms supported most of our hypothesized links, underscoring how the CEO-TMT interface helps explain transformational CEOs' role in promoting corporate entrepreneurship.

Transformational leaders are drawn by the need to transform individuals, teams, and firms by going beyond the status quo and, in so doing, affect their firms' ability to innovate and adapt. Widely examined as a multifaceted meta-construct, transformational leadership consists of exhibition of four interdependent and mutually reinforcing attributes. These are (1) charisma: creating and presenting an attractive vision of the future; (2) inspirational motivation: energizing followers to go beyond self-interest; (3) intellectual stimulation: stimulating followers to challenge assumptions and view problems from new perspectives; and (4) individualized consideration: focusing on follower development by providing support, encouragement, and coaching (Bass, 1985).

Described as the "givers" and "definers" of adaptive organizational culture (Waldman & Yammarino, 1999), CEOs who are transformational

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leaders are believed to induce organization members to constantly anticipate and adapt to environmental change (Jung, Chow, & Wu, 2003; Waldman, Javidan, & Varella, 2004). For example, Kotter suggested that a firm's entrepreneurial proclivity is enhanced to the extent that a transformational vision seeps into the very fiber of the firm to become "the way we do things around here" (1995: 652). Transformational CEOs are also believed to enhance this proclivity by being enthusiastic about innovation (Howell & Higgins, 1990) and by showing how volatility in the firm's competitive environment can be turned into a vision of opportunity (Avolio, Zhu, Kho, & Puja, 2004).

It would seem to follow then that transformationally led firms are more likely to engage in corporate entrepreneurship, defined by Zahra (1996) as the sum of a firm's product innovation, business venturing, and strategic renewal activities. Yet researchers have been equivocal about the general importance of CEOs' roles in affecting such firm-level outcomes. Some have suggested that CEO impact may be, at best, minimal (e.g., House & Aditya, 1997; Meindl, 1998) or concluded that "the top

team, rather than the top person, has the greatest effects on organizational functioning" (O'Reilly, Snyder, & Boothe, 1993: 10), whereas others have viewed CEO impact as being more directed at organizational aspects of a firm that may in their turn affect firm outcomes (Peterson, Smith, Martorana, & Owens, 2003; Thomas, 1988). According to this latter view, such equivocality reflects the many direct and indirect influences of CEOs on their firms, especially given the number of possible intervening mechanisms that influence firm-level outcomes and that CEOs are likely to affect.

With the exception of Peterson and colleagues (2003), however, researchers have paid scant attention to intervening mechanisms. Indeed, the upper echelons theory's argument (Hambrick & Mason, 1984) may have conceptually constrained such pursuits by not precisely distinguishing between the impact of a firm's CEO and that of the firm's top management team (TMT) (cf. O'Reilly et al., 1993). Therefore, we propose and test a model that explores the mechanisms underlying transformational CEOs' main effects. Specifically, in keeping with Peterson and colleagues' (2003) research, which applied a five-factor model to examine the effects of CEO personality on a selected set of TMT constructs in nine firms, our model focuses on the CEO-TMT interface. We complement their study by using this interface to explain the effects of CEO transformational leadership on the pursuit of corporate entrepreneurship. Although it is not central to our theoretical model, to more didactically develop the latter we borrow Hambrick's (1994) framework identifying four general elements (process, structure, composition, and incentives) that underlie TMT effects on firm-level outcomes. Following this framework, and informed by insights from the upper echelons and corporate entrepreneurship literatures, we identify and then hypothesize four salient TMT characteristics that are both influenced by transformational CEOs and influence corporate entrepreneurship. We report tests of our model using data from a multisource survey of CEOs and members of their TMTs in 152 firms.

## THEORETICAL BACKGROUND

To date, upper echelons research has suggested that TMTs influence various firm-level behaviors and outcomes (see Carpenter, Geletkanycz, and Sanders [2004] for a review). TMT characteristics have been linked by such research to the order and timing of new product moves (Srivastava & Lee, 2005), product innovation (Bantel & Jackson, 1989), and strategic change (Wiersema & Bantel, 1992). However, Jackson (1992), among others (e.g., Kli-

moski & Koles, 2001; Peterson et al., 2003), observed that upper echelons research typically treats CEOs as members of their TMTs, averaging their characteristics to assess such things as overall TMT demographic composition. As a result, such research has paid little attention to the CEO-TMT interface, or the common boundary between these two sets of actors, to explain the effects of CEOs on firm-level outcomes (Peterson et al., 2003).

This oversight is curious in that it is well understood that CEOs are uniquely responsible for selecting, evaluating, rewarding, motivating, and coaching members of their TMTs. In fact, there are at least two reasons why, from a leadership theory perspective, the CEO-TMT interface should be particularly salient. First, CEOs are expected to have a greater impact on those with whom they work directly, unlike group leaders at lower levels, whose influence is likely to be constrained and mitigated by periodic interventions from senior managers (Zaccaro & Klimoski, 2002). Second, and equally important, the often distorted and unrealistic "great man" views of CEOs are less likely at this interface, because here the CEO's leadership style is assessed and interpreted by close direct reports, rather than by those who are more socially distant in a firm (Katz & Kahn, 1978; Shamir, 1995). Indeed, Hambrick argued that TMT characteristics do not occur in isolation, but rather are significantly traceable to CEO leadership style, suggesting that "the top group leader has a disproportionate, sometimes nearly dominating influence, on the group's various characteristics and outputs" (1994: 180).

In keeping with Hambrick's (1994) argument, our thesis is that a CEO's transformational proclivity impacts his or her firm's engagement in corporate entrepreneurship by shaping characteristics of the TMT. For example, we reason that transformational CEOs can influence corporate entrepreneurship by encouraging their TMTs to be more responsive to new opportunities and associated risks and more committed to initiating and supporting entrepreneurial initiatives. Such a CEO can also have an influence because, the more responsive and committed the TMT is to a firm's entrepreneurial vision, the more apt team members are to marshal their subordinates' efforts toward that vision.

## HYPOTHESES

Hambrick (1994) proposed a generalized framework to capture the essential elements that underlie the effects of a TMT on firm-level outcomes, and he suggested that considering these elements in concert provides a more comprehensive and grounded starting point than many of the previous

TMT studies focusing on only part of them. These elements include a TMT's process, or the nature of interaction among TMT members; structure, or the organization within which TMT members enact their roles; composition, or the collective characteristics of TMT members; and incentives, or the compensation that TMT members receive. Hambrick described each element in very broad terms so as to accommodate specific characteristics within each. Drawing from the entrepreneurial and upper echelons literatures, we identify four specific TMT characteristics that, we reason, are directly influenced by transformational CEOs and, as well, are salient to a firm's pursuit of corporate entrepreneurship. As detailed below, we posit behavioral integration as a process characteristic, decentralization of responsibilities as a structural characteristic, risk-taking propensity as a compositional characteristic, and long-term compensation as an incentive-based characteristic.

### Behavioral Integration

Behavioral integration refers to the degree to which a TMT engages in mutual and collective interaction. Developed by Hambrick (1994, 1995, 1998, 2005), this team process construct parsimoniously recasts a TMT's social and task processes into a meta-construct consisting of one social dimension (the level of the team's collaborative behavior) and two task dimensions (the team's quantity and quality of information exchanged and its emphasis on joint decision making). Hambrick (1994) reasoned that these mutually reinforcing processes, when taken in concert, better capture a TMT's level of wholeness and unity of effort than do process constructs such as cohesion, social integration, and communication quality. For example, Hambrick argued that although a purely cohesive team may experience "groupthink" (Janis, 1983), a behaviorally integrated team should be less apt to encounter this problem because task processes, such as extensive sharing of information, should offset this downside of too much cohesiveness. Thus, the meta-dimensional nature of behavioral integration prevents it from attributing more import to a single process dimension than is warranted.

We reason that the attributes of transformational CEOs can facilitate the achievement of both the social and task processes that underlie a TMT's behavioral integration. Regarding social processes, studies have shown that by articulating and transmitting a strong sense of vision and mission, as well as inspiring followers to high levels of collective satisfaction, transformational leaders raise fol-

lowers' social identification, which motivates them to base their self-concepts and self-esteem partly on their belonging to the group (Trice & Beyer, 1993). Such social identification has been found to arouse pride, respect, trust, and loyalty among followers (Shamir, House, & Arthur, 1993), which should motivate them to cooperate more fully with each other, engage in more intensive exchange, and contribute more to their team (Shamir et al., 1993). Supporting this argument, empirical research has suggested that teams with leaders who are less neurotic or possess more positive views of the world—a personality trait predictive of transformational leadership (Bono & Judge, 2004)—experience greater social integration (Peterson et al., 2003). Regarding task processes, transformational leaders are expected to challenge followers to view problems from a diversity of perspectives (Bass, 1985; Sosik, 1997). Diverse perspectives help a team avoid cognitive homogeneity and simplification, both of which tend to reduce the quality of information exchanged and obviate the need for joint decision making. Moreover, transformational leaders seek followers' participation by highlighting the importance of cooperation in performing collective tasks (Jung, Chow, & Wu, 2003). Thus,

*Hypothesis 1. CEO transformational leadership is positively associated with top management team behavioral integration.*

Furthermore, when a TMT is behaviorally integrated, it is more likely to contribute to a firm's pursuit of corporate entrepreneurship. In part, this can be explained by Hambrick's (1994) observation that when TMTs lack behavioral integration, even though the individual members may possess all the information, insights, and energies needed to do their own jobs, they are unable, or disinclined, to engage in internal information exchange, collaboration, and mutual adjustment. Thus, "although ideas are formed in the minds of individuals, such interactions typically play a critical role in developing ideas," so that absent integration, TMTs are less likely to develop a "community of interaction" (Nonaka, 1994: 15). Nonaka further argued that without a functioning "community" at the top, an organization cannot effectively develop and exploit new knowledge, which suggests that corporate entrepreneurship will suffer. Complementing this argument, Hambrick (1998) suggested that firms with less behaviorally integrated TMTs are more likely to be impaired by tactical impediments (e.g., unrealized economies of scope, poor coordination between departments, and the like), as well as bureaucratic impediments (e.g., difficulties in reaching consensus on strategic changes).

Conversely, by sharing decision making, information, and effort, behaviorally integrated TMTs are better able to shorten the time needed to develop a collective understanding of environmental changes, such as customers' changing needs, and formulate corresponding responses (Hambrick, 1998; Smith, Smith, Olian, Sims, O'Bannon, & Scully, 1994). Further, a TMT's unity of effort and involvement in decision making can increase members' commitment to new entrepreneurial initiatives and stimulate their enthusiasm to "sell" these initiatives to subordinates, thereby facilitating the transformation of entrepreneurial ideas into actionable outcomes for the firm (Damanpour, 1991; Stevenson & Jarillo, 1990). In keeping with this argument, Hambrick (1998) found that firms with behaviorally integrated TMTs had less difficulty orchestrating transformations to enhance product innovation, international sales, and cooperative production, and Lubatkin, Simsek, Ling, and Veiga (2006) found that a TMT's behavioral integration significantly contributed to its firm's ability to pursue new strategic initiatives. Thus,

*Hypothesis 2. Top management team behavioral integration is positively associated with corporate entrepreneurship.*

#### Decentralization of Responsibilities

Similar to Hage and Aiken's (1967) notion of authority hierarchy, decentralization of responsibilities refers to the degree of concentration of decision making in regard to task and operational activities within a TMT. In brief, the more responsibility over day-to-day tasks and tactical decisions a firm's CEO delegates to the members of its TMT, the more responsibilities are decentralized. Thus, this structural characteristic is intended to capture each member's flexibility and latitude in making tactical and operational decisions, as opposed to the TMT process construct of joint decision making that is reflected in behavioral integration and associated with team-level strategic decisions (Baum & Wally, 2003).

We reason that when a TMT is led by a transformational CEO, responsibilities for specific key tasks needed to achieve important strategic decisions are more likely to be distributed among TMT members because such leaders seek to encourage self-management and self-development among followers (Barling, Moutinho, & Kelloway, 2000). In particular, by providing followers with greater latitude and a greater sense of responsibility, transformational leaders more fully empower and intellectually stimulate team members (Dvir, Eden, Avolio,

& Shamir, 2002). And, by being more attentive to followers' individual needs, these leaders enhance individual team members' willingness to take responsibility. Put differently, Avolio and Gibbson (1988) have gone so far as to argue that a major goal of transformational leaders is to develop followers' self-management and self-development skills by allowing them to make and implement actions without direct supervision or intervention.

Hence, transformational CEOs tend to be more likely to structure their TMTs in such a way as to encourage decentralization of responsibilities among TMT members as a direct manifestation of their leadership style (Zhu, Chew, & Spangler, 2005). Research has provided some additional evidence to support this tendency by suggesting that "highly agreeable leaders," as transformational CEOs have been labeled (Judge & Bono, 2000; Rubin, Munz, & Bommer, 2005), tend to promote decentralization of power within their teams (Peterson et al., 2003). Indeed, research has shown that transformational leaders not only empower team members by giving them high autonomy (Smith, Montagno, & Kuzmenko, 2004), but also increase their perceptions of the amount of authorized power they have (Ozaralli, 2003). Therefore, we expect:

*Hypothesis 3. CEO transformational leadership is positively associated with top management team decentralization of responsibilities.*

Relative to their CEO, senior managers are closer to the product-markets, customers, and operational details that serve as the stimuli for exploiting innovative ideas. In a more centralized structure, however, TMT members may have little motivation to recognize new market opportunities or tactical problems, because they lack the authority to act on them without the CEOs' approval (Rickards, 1985). Further, the time and effort associated with obtaining CEO approval may also impair the firm's responsiveness. Not surprisingly, therefore, Caruana, Morris, and Vella (1998) found that centralization limited firms' entrepreneurial behavior, and Damanpour (1991) found a negative relationship between centralization and organizational innovation.

In contrast, in more responsibility-decentralized TMTs, decision-making authority is delegated to those who have greater experience and expertise to diagnose problems and implement solutions in their domain. Amabile (1995) argued that such delegation is fundamental to a firm's ability to innovate, because it helps the firm better reap each manager's knowledge. In addition, because delegation gives individuals more control over how they

accomplish tasks, it increases their intrinsic motivation and facilitates their more creative endeavors (Basadur, 2004). In keeping with this line of reasoning, Atuahene-Gima (2003) reported that decentralization was positively related to new product development in fast-changing environments. Thus,

*Hypothesis 4. Top management team decentralization of responsibilities is positively associated with corporate entrepreneurship.*

### Risk Propensity

A TMT's shared preference for risky growth opportunities is likely to be enhanced by transformational CEOs, because such leaders possess both a vision and a measured degree of optimism about change, and they tend to communicate inspirational messages that both challenge TMT members to think "outside of the box" and to instill in them the confidence that obstacles can be overcome (Bass, 1985). These messages should not only mitigate TMT member reluctance to pursue growth opportunities with reasonable risks (Amabile, Schatzel, Moneta, & Kramer, 2004), but also engender in them a heightened sense of team efficacy, as well as individual efficacy (Jung & Sosik, 2002), which should further enhance the TMT's willingness to take risks (Zhao, Siebert, & Hills, 2005). Put differently, transformational leaders, as passionate, but not reckless, advocates for change are better able to convince followers to frame decisions in an unskeptical manner and to buy into a risky vision, based at least as much on trust in the leader as in critical analysis (Flynn & Staw, 2004). Further, these leaders tend to emphasize teaching and coaching that necessitates followers accepting some risk, along with the potential for failure, as a part of the developmental process (Nystrom, 1993). Thus, when a transformational CEO stimulates a TMT's members' efforts to be innovative and creative by questioning the team's assumptions, reframing problems, and encouraging consideration of new ways to approach existing situations, the leader helps to alleviate some of their concerns associated with such undertakings (Amabile et al., 2004), thereby enhancing the TMT's propensity to take risk. For all these reasons, we hypothesize:

*Hypothesis 5. CEO transformational leadership is positively associated with top management team risk propensity.*

Entrepreneurial activities like innovation, venturing, and strategic renewal entail considerable risk, because time, effort, and resources must be invested before the distribution of their returns is

known, but they also entail the potential for considerable return. Consequently, on the basis of the assumption that TMT members' collective values guide the team's strategic choices (Finkelstein & Hambrick, 1996), it would follow that the greater a TMT's shared preference for risky growth opportunities, the more apt the firm is to engage in corporate entrepreneurship. Simply put, a TMT with a greater propensity for risk taking is more likely to focus on the potential benefits of risk-entailing entrepreneurial activities, and more risk-averse TMTs are more likely to focus on the potential losses (Sitkin & Weingart, 1995). Moreover, this greater acceptance of risk might also cascade down to those whom TMT members manage, thus further supporting and enhancing the firm's entrepreneurial proclivity. Supporting this prediction, Knight, Durham, and Locke (2001) found a positive relationship between managerial risk taking and innovative task performance, and Gilley, Walters, and Olson (2002) concluded that TMT risk taking had a strong, positive influence on firm innovativeness. Thus, we hypothesize:

*Hypothesis 6. Top management team risk propensity is positively associated with corporate entrepreneurship.*

### Long-Term Compensation

With the exception of Goodwin, Wofford, and Whittington (2001), who suggested that rewards for performance may be tied to transformational leadership, discussion of the use of contingent rewards has generally been absent from research on transformational leadership. This may be because these rewards are viewed as being central to the construct of transactional leadership (Bass, 1990). Nevertheless, this absence is curious, since effective leaders, regardless of their leadership style, are believed to carefully manage performance-based incentives.

We reason that what distinguishes transactional leaders from transformational leaders is their choice of performance time horizon. Specifically, transactional leaders, because they seek to monitor and control rather than inspire followers, are more likely to base rewards on immediate, short-term performance, and transformational leaders are more likely to base rewards on longer-term performance. Indeed, research has shown that when managers and employees are rewarded only for their accomplishments during a short, fixed time period (e.g., via monthly or semiannual performance reviews), they are primarily motivated to expend just the effort required by the job and make little effort to realize their full potential (Gomez-Mejia, 1992;

Henderson & Fredrickson, 1996). Clearly, such motivational outcomes, especially among members of a TMT, are incongruent with a transformational leadership style and expectations. Said differently, because transformational leaders are guided by the principle of encouraging followers to exceed expectations and generate the highest levels of performance for the collective (Dvir et al., 2002), they are more apt to base rewards on long-term expectations.

At the same time, compared to short-term compensation, long-term compensation demands that followers place great trust in their leader, because they are aware of the time lag between initiating action and receiving rewards. Long-term compensation also calls for the existence of a visioning mechanism that helps followers see how their actions can subsequently influence future firm performance (Cogliser & Brigham, 2004). Consequently, given that the ability to provide vision and build trusting relationships is more characteristic of transformational than transactional leaders (Bass, 1985), we reason that transformational CEOs are more likely to facilitate the implementation of a compensation system that makes TMT rewards contingent upon a firm's long-term performance. Thus,

*Hypothesis 7. CEO transformational leadership is positively associated with the extent to which a top management team's compensation is based upon the long-term performance of its firm.*

Drawing from agency theory, researchers have suggested a link between the performance objectives upon which a manager's compensation is contingent and the manager's willingness to pursue growth-oriented, risk-taking initiatives, like innovation, venturing, and strategic renewal (Rajagopalan, 1997). Specifically, it has been recognized that short-term compensation clearly links managerial rewards to a firm's short-term performance and generates no further risk or commitment on the part of the manager, since the value of a short-term reward is not affected by how well the firm does in the future (Rajagopalan, 1997). As such, managers whose compensation is contingent upon the firm's short-term performance are less likely to be motivated to pursue entrepreneurial initiatives, which involve long lead times between investment and eventual pay-off. Indeed, some researchers (Jones & Butler, 1992; Zahra & Hayton, 2002) have proposed that managers whose compensation is tied to short-term performance objectives tend to view entrepreneurial initiatives as threatening to their performance appraisal and employment, because

short-term performance matrixes such as net income are typically adversely affected by such initiatives (Rappaport, 1978).

In contrast, however, managers whose compensation emphasizes their firms' long-term performance are believed to have greater incentive to pursue such initiatives, because their personal gain depends strongly upon the company's future welfare. In other words, when TMT members are evaluated and compensated on the basis of a longer time horizon, they should embrace a long-term orientation, perceive greater ownership of and commitment to entrepreneurial initiatives, and consequently be more predisposed to pursuing such undertakings (Black & Scholes, 1973). Consistently with this view, Waagelein (1988) found a negative association between short-term bonus plans and R&D expenditures, and Rappaport (1978) found a positive association between compensation plans that were tied directly to a firm's long-term performance and R&D expenditures. Similarly, Holthausen, Larcker, and Sloan (1995) found that the proportion of total compensation tied to a firm's long-term performance was positively related to future innovation. From this, we expect:

*Hypothesis 8. The extent to which a top management team's compensation is based upon the long-term performance of its firm is positively associated with corporate entrepreneurship.*

## METHODS

### Data Collection Techniques and Sample

We chose small-to-medium-sized firms (SMEs) as a sampling frame, because firms of this size (i.e., employing no more than 500 individuals) presented a more direct litmus test for our hypotheses. Compared to large firms, SMEs have fewer intervening levels of management that can dilute the influence of their CEOs and TMTs on firm-level outcomes. Moreover, SMEs are less constrained than large public firms by extraneous influences, like those coming from a powerful board of outside directors, capital markets, and the strategic and administrative challenges of competing with multiple divisions.

We identified 795 SMEs in New England as our initial population, using Dun & Bradstreet's (D&B's) Million Dollar Database in 2004. Then, to induce CEOs from this population to participate, we sent a letter endorsed by the director of the regional Small Business Development Center to each CEO. The letter explained the research project, encouraged participation, and indicated that we would follow up by telephone. We then began contacting CEOs to

request participation and, if they agreed, to schedule meetings. One hundred ninety-three CEOs agreed. During our meetings, the nature of the study was further explained, and each CEO received a survey to complete and return via a postage-paid envelope. Then, following Smith and colleagues (1994), we asked these CEOs to identify all of their TMT members and to send them a memo encouraging them to participate along with a survey and postage-paid return envelope. After excluding incomplete surveys, surveys from the firms that had less than a 50 percent intrateam response rate, and surveys from CEOs with less than three years tenure, we had usable responses from 152 firms' CEOs and 416 of their TMT members, representing 20 percent of the firms in the original sampling frame.

The CEOs in our final sample had held their positions for 14 years, on average, and had spent an average 19 years with their firms. Their firms employed an average of 62 people, had been in business for 24 years, and reported median sales of \$5.1 million. All but 14 of the 152 sample firms were privately held. Classified in terms of the first two digits of the North American Industry Classification System (NAICS), the firms primarily represented three industries: manufacturing (56%), scientific and technical services (18%), and construction (12%); the remaining firms were spread out over several different industries. A paired comparison test indicated no significant differences in firm age, size, or industry between firms whose CEOs agreed to participate in our study and those that did not.

Finally, the sample firms' TMTs averaged 4.5 members and, on average, 81 percent of the members of each TMT responded to our survey, a rate that compares favorably with that of most upper echelons studies (cf. Geletkanycz, 1998; Smith et al., 2005). Moreover, the data showed a high level of stability in the composition of the sampled TMTs, with 91.4 percent of the surveyed members having served on their respective teams for at least three years.

## Measures

**Transformational leadership.** This was measured with the Multifactor Leadership Questionnaire (MLQ Form 5X-Short) developed by Bass and Avolio (1995) and shown by Avolio, Bass, and Jung (1999) to possess convergent and discriminant validity. Specifically, we asked the members of each TMT, except the CEO, to evaluate how frequently their CEO engaged in four components of transformational leadership—charisma, inspirational mo-

tivation, intellectual stimulation, and individualized consideration—on a scale ranging from 1 ("not at all") to 5 ("frequently, if not always").

A one-way analysis of variance (ANOVA) using firm affiliation as the independent variable was performed on each item as a means to determine if there was greater variability in the ratings between organizations than within organizations. A significant ( $p < .001$ )  $F$  for each item legitimized our aggregating the individual team member scores. We also used James, Demaree, and Wolf's (1993) interrater reliability coefficient ( $r_{wg}$ ) to examine the intragroup reliability of responses. A value greater than or equal to .70 indicates good agreement within a group. The average intragroup reliability of this scale was .82, further legitimizing the aggregation of individual team member scores. The reliability for the overall transformational leadership score was .90. Appendix A gives the results of a confirmatory factor analysis for this and all the other constructs in our study and also provides the complete scale for each construct.

**Behavioral integration.** We used the nine-item scale developed and validated by Simsek, Veiga, Lubatkin, and Dino (2005). Those researchers found this measure, which they designed to capture a TMT's level of *collaborative behavior, information exchange, and joint decision making*, to have content, construct, and convergent validity. All TMT members, including the CEOs, assessed these team processes using a scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). An ANOVA suggested that individual scores could be aggregated to the team level ( $p < .001$ ). The average  $r_{wg}$  for the scale was .80. The overall measure of TMT behavioral integration had a Cronbach's alpha of .90, which compares favorably to the alpha of .85 reported by Simsek and colleagues (2005).

The other main variables, which are described next, were all rated on the same five-point scale used for behavioral integration.

**Decentralization of responsibility.** This seven-item scale was adapted by Sutcliffe (1994) from a scale originally developed by Glick, Huber, Miller, Doty, and Sutcliffe (1990). These items captured the extent to which team members perceive they have responsibility and authority regarding seven aspects of day-to-day operations. All TMT members, including the CEOs, completed this scale. Again, ANOVA ( $p < .001$ ) and  $r_{wg}$  (average  $r_{wg} = .87$ ) results legitimized the aggregation of individual team member scores. The reliability of the measure was .92.

**Risk propensity.** Following Gilley et al. (2002), we measured TMT shared preference for risky growth opportunities using six items. Again, all



TMT members, including the CEOs, were asked to complete this scale, and ANOVA results supported aggregating individual scores to the team level ( $p < .001$ ). The average intragroup reliability ( $r_{wg}$ ) for the TMT risk propensity scale was .86. However, the third item, "Our team prefers to carefully analyze a situation before moving," which was reverse-scored, had a low squared multiple correlation (.27) with other items and, thus, was dropped from further analyses. The reliability of the five-item measure was .78.

*Long-term compensation.* We used Balkin and Gomez-Mejia's (1990) three-item measure. The three items asked TMT members, including CEOs, to evaluate the executive compensation in their firms. ANOVA ( $p < .001$ ) and  $r_{wg}$  (average  $r_{wg} = .84$ ) results again supported aggregating individual scores to the team level. The overall measure reliability was adequate [ $\alpha = .85$ ].

*Corporate entrepreneurship.* We used Zahra's (1996) 16-item scale, which broadly measures a firm's entrepreneurial activities on three dimensions: innovation (creating and introducing products, production processes, and organizational methods), venturing (expanding operations in existing or new markets), and strategic renewal (changing the scope of business and/or its competitive approaches). Team members, including the CEOs, were asked to rate their firms' actual, rather than preferred, entrepreneurial activities. Each dimension consisted of 5 items, except for strategic renewal, which had 6 items.

An ANOVA again confirmed ( $p < .001$ ) that the individual scores could be aggregated to the group level. The average intragroup reliability for this scale was .83. An examination of aggregated data showed that for one item of strategic renewal ("The firm has divested several unprofitable business units"), 33 percent of the cases lacked data, indicating that this item was not applicable to many of the participant firms. Therefore, we dropped this variable, reducing the number of items from 16 to 15. The overall measure had a reliability of .88.

Zahra (1996) demonstrated the validity of this scale by showing that it significantly correlated with Miller's (1983) corporate entrepreneurship index and an objective indicator consisting of a firm's R&D spending, number of new products, and sales growth. Like Zahra, we obtained an objective measure of sales growth from D&B's Million Dollar Database (the only performance measure listed in this database) for 128 of our sample firms for 2005. We correlated this objective measure with our measure of corporate entrepreneurship and found, like Zahra, a positive and significant association ( $r = .27, p < .01$ ).

*Covariates.* To reduce the variance caused by other factors that are extraneous to the research question, we included firm size and firm age in the study. We also controlled for TMT size, the average of TMT members' team tenure, TMT diversity in team tenure, education level, and functional background, as well as CEO tenure, since all have been examined in previous TMT studies (Simsek et al., 2005; Smith et al., 1994). Following Allison (M78), we used the coefficient of variation to measure tenure diversity by dividing each team's standard deviation by the team's mean. We asked respondents to report the highest educational degree they had attained (i.e., high school, baccalaureate, master's, Ph.D., or J.D.). As did Smith and colleagues (1994), we transformed the answers on highest degree into years of formal education and then computed each group's coefficient of variation to estimate education-level diversity. We also asked respondents to indicate which of the following categories reflected their functional specialty: finance, accounting, information system, personnel, general management, marketing, operations, research and development, or general counsel/secretary. We then used Blau's (1977) index, which assesses the number of significant categories in a distribution and how individuals are dispersed over such categories, to compute functional background diversity. Firm size, firm age, TMT size, the average of team tenure, and CEO tenure were square-root-transformed to achieve normality.

We also controlled for a firm's unabsorbed slack and its past performance [i.e., before the focal year] as has previous research on corporate entrepreneurship (Zahra, 1996). Unabsorbed slack was measured by all TMT members using a four-item measure (Simsek, Veiga, & Lubatkin, 2007), of which two items were from Chattopadhyay, Click, and Ruber (2001), and two were from Nohria and Gulati (1996). These items captured the extent to which a firm: (1) has had plentiful resources to produce its products and/or service, (2) has had abundant resources for training and rewarding employees to actively think about changes or new business problems, (3) has made a great deal of resources available for experimental projects, and (4) has had more resources than promising ideas for using all of its resources. The average intragroup and overall measure reliabilities were adequate ( $r_{wg} = .84; \alpha = .76$ ). Since objective data on the performance of smaller firms are generally not available, we used their CEOs' evaluation of past firm performance. We asked the CEOs to compare their firms' past performance with that of their major competitors on profitability and growth, using an eight-item scale from Covin, Prescott, and Slevin (1990). Cron-

bach's alpha for the measure was .95. Finally, we controlled for type of industry and environmental uncertainty to rule out the influence of a firm's external environment on corporate entrepreneurship. As noted above, the firms in our sample were categorized into four industries: manufacturing, scientific and technical services, construction, and other; we then dummy-coded variables for the first three industries. Environmental uncertainty was evaluated by all TMT members using a four-item scale reported by Waldman, Ramirez, House, and Puranam (2001); however, our reliability test resulted in two items being dropped so that an acceptable reliability ( $\alpha = .75$ ) could be achieved. The two remaining items gauged the extent to which a firm's major industry was (1) very risky and such that "one false step can mean the firm's undoing" and (2) very "stressful, exacting, hostile, and hard to keep afloat [in]." The intragroup reliability was .79.

## ANALYSES AND RESULTS

We used maximum-likelihood structural equation modeling (SEM) to test our model's hypotheses because SEM allows estimation of multiple associations, simultaneously incorporates observed and latent constructs in these associations, and accounts for the biasing effects of random measurement error in the latent constructs (Shook, Ketchen, Hult, & Kacmar, 2004). We adopted the two-step approach to SEM outlined in Anderson and Gerbing (1988), as numerous researchers, such as Hoyle and Panter (1995), have recommended. The first phase of this approach involves using a confirmatory factor analysis (CFA) model to fit to the observed data. The second phase involves comparing a sequence of nested structural models to gain information concerning the structural model that best accounts for the covariances observed between the exogenous and endogenous constructs. Below, we report results from both phases and results for each individual hypothesis.

### Phase 1: Confirmatory Factor Analysis Model Results

For the initial CFA, each latent variable in SEM needs to be explicitly assigned a metric or a measurement range (Kline, 1998). We did so by setting a path for each latent variable to 1.0. Factor loadings were also set equal to 1.0 for nonlatent variables.

Multiple indexes were used to assess the fit of each model. The criteria examined included chi-square ( $\chi^2$ ) and the comparative fit index (CFI),

incremental fit index (IFI), Tucker-Lewis index (TLI), and root-mean-square error of approximation (RMSEA). When a hypothesized model fully captures the data from a sample population, the CFI, IFI, and TLI are expected to have values of 1.0, and the RMSEA, a value of 0.0. Although standards for such indexes are difficult to establish, a value of .90 or higher for the CFI, IFI, and TLI and a value of .08 or lower for the RMSEA are typically suggested as indicating adequate fit (Hu & Bentler, 1999). The values on the fit indexes indicated our measurement model had adequate fit ( $\chi^2[422, n = 152] = 679.50, p < .001, CFI = .91, IFI = .91, TLI = .91, and RMSEA = .05$ ).

As Hair, Anderson, Tatham, and Black noted, once an overall CFA model has been accepted, "Each of the constructs can be evaluated separately by: (1) examining the indicator loadings for statistical significance and (2) assessing the construct's reliability and variance extracted" (1998: 652). Results for our CFA indicate that the relationship between each indicator and its respective variable was statistically significant ( $p < .001$ ), verifying the posited relationships among indicators and constructs, and thus, convergent validity.

For evidence of discriminant validity, we examined bivariate interitem correlations. Table 1, which summarizes means, standard deviations, and correlations among all study variables, provides some initial evidence of discriminant validity. No interfactor correlation is above the recommended level of .65 (Tabachnick & Fidell, 1996: 86). At the same time, we verified that for each latent variable the average variance extracted by its measure was larger than its shared variance with any other latent variable. From this result, we concluded that problems created by a lack of discriminant validity were not likely to bias our data.

### Phase II: Sequence of Nested Structural Models Results

The second phase of Anderson and Gerbing's (1988) approach involves making contrasts between sequences of nested structural models to obtain information concerning a better-fitting structural model that better accounts for the observed covariances among the latent constructs. To gain a complete understanding of our individual hypotheses, we tested four nested structural models. In evaluating these models, we followed the suggestions of Jöreskog (1993) and Bollen (1989) to assess (1) model fit using various fit indexes and (2) the significance of the completely standardized path estimates, as a test of the model's hypotheses.

The first structural model examined is the

TABLE 1  
Means, Standard Deviations, and Correlations among Variables<sup>a</sup>

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1. CEO transformational leadership	3.55	.62																				
2. Behavioral integration	3.51	.44	.52***																			
3. Decentralization of responsibilities	3.14	.58	.46***	.59***																		
4. Risk propensity	2.96	.49	.22**	.29***	.29***																	
5. Long-term compensation	3.22	.73	.50***	.50***	.46***	.24**																
6. Corporate entrepreneurship	2.70	.56	.35***	.27***	.35***	.37***	.31***															
7. Firm size	61.69	50.98	-.01	-.10	.11	-.01	.05	.05														
8. Firm age	24.25	19.29	.04	.01	-.03	-.13	.08	-.12	-.09													
9. TMT size	4.48	1.63	.05	-.07	-.11	-.02	-.11	.12	.13	-.07												
10. TMT tenure	9.51	5.19	.03	.17*	.11	.07	.27**	.01	.01	.23**	-.17**											
11. Diversity of team tenure	.61	.31	-.03	-.04	-.08	-.02	-.01	.02	.04	.12	.18*	.01										
12. Diversity of education level	.11	.08	-.04	.01	-.09	-.04	.04	-.11	-.03	-.05	.12	-.11	-.05									
13. Diversity of functional background	.48	.23	.01	-.04	-.13	-.12	-.17*	-.06	.14	.10	.35***	-.13	.14	.03								
14. CEO tenure	14.10	8.76	.02	.14	.03	-.01	.19*	.04	-.18*	.14	-.08	.62***	-.33***	-.10	-.10							
15. Unabsorbed slack	2.53	.62	.32***	.27**	.13	-.04	.42***	.16*	-.13†	.12	-.04	.27**	.08	.14	.05	.23**						
16. Past firm performance	3.32	.74	-.12	-.13	-.02	.11	-.04	-.01	-.06	.06	.06	.01	.13	.03	-.01	.20**	-.01					
17. Service industry <sup>b</sup>	.18	.38	.06	.04	.12	.06	-.12	.17*	-.10	-.19*	.03	-.15†	-.04	-.09	-.11	-.09	-.21**	.11				
18. Construction industry <sup>b</sup>	.11	.32	.06	.06	-.05	-.10	.09	-.15†	.06	-.06	-.11	.09	-.02	-.20**	-.01	.04	.15†	-.05	-.17*			
19. Manufacturing industry <sup>b</sup>	.56	.50	-.11	-.06	-.11	-.01	.04	.01	.15*	.03	-.03	-.03	.01	-.09	.08	-.08	.05	-.13	-.52***	-.42***		
20. Environmental uncertainty	2.96	.70	-.15†	.04	.08	-.09	-.02	-.06	.23**	-.04	-.09	.14†	-.14	.04	-.09	.04	-.12	-.05	-.03	.16*	.02	

<sup>a</sup>  $n = 152$ .

<sup>b</sup> Coded as a dummy variable.

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

**TABLE 2**  
**Summary of Fit Indexes for Contrasts Based on the Hypothesized Model<sup>a</sup>**

Model	df	$\chi^2$	CFI	IFI	TLI	RMSEA	Comparison	$\Delta\chi^2$	$\Delta df$	$R^2$ in Corporate Entrepreneurship
<i>Covariates only</i>										
Model 1	508	1,018.99***	.83	.84	.75	.09				.27
<i>Covariates plus</i>										
Model 2: transformational leadership to behavioral integration, decentralization of responsibility, risk propensity, and long-term compensation	504	880.93***	.87	.88	.81	.08	Model 2 vs. 1	138.06***	4	
Model 3 (full mediation): transformational leadership to behavioral integration, decentralization, risk, and compensation; behavioral integration, decentralization, risk, and compensation to corporate entrepreneurship	500	858.57***	.91	.91	.90	.06	Model 3 vs. 2	22.36***	4	.37
Model 4 (partial mediation): transformational leadership to corporate entrepreneurship (controlled); transformational leadership to behavioral integration, decentralization, risk, and compensation; behavioral integration, decentralization, risk, and compensation to corporate entrepreneurship	499	853.40***	.92	.92	.91	.05	Model 4 vs. 3	5.17*	1	.42

<sup>a</sup>  $n = 152$ . Variable names are abbreviated in models 3 and 4. Covariates include firm size; firm age; TMT size; average TMT tenure; TMT diversity in team tenure, education level, and functional background; CEO tenure; unabsorbed slack; past firm performance; industry type; and environmental uncertainty.

\*  $p < .05$

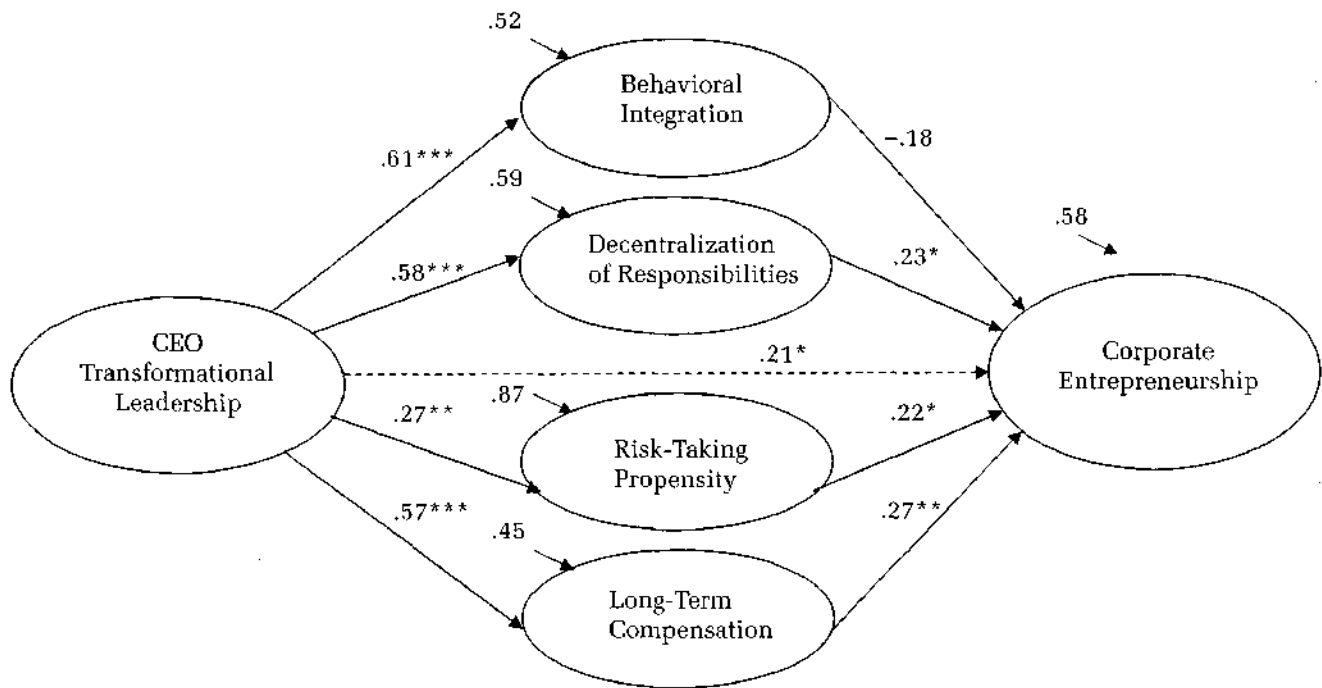
\*\*\*  $p < .001$

covariates model (model 1 in Table 2), which specifies the influences of all team-, firm- and environment-level covariates on the model's five endogenous constructs. These covariates accounted for 27 percent of the variance in corporate entrepreneurship, 19 percent of the variance in behavioral integration, 15 percent of the variance in decentralization of responsibilities, 6 percent of the variance in risk propensity, and 30 percent of the variance in long-term compensation. Model 2 specifies the effects of transformational leadership on the four TMT variables without linking transformational leadership directly to corporate entrepreneurship. Supporting Hypotheses 1, 3, 5, and 7, transformational leadership was positively associated with and explained additional variance in behavioral integration (.61,  $p < .001$ ;  $AR^2 = .29$ ), decentralization of responsibilities (.58,  $p < .001$ ;  $AR^2 = .26$ ), risk propensity (.27,  $p < .01$ ;  $AR^2 = .07$ ), and long-term compensation (.57,  $p < .001$ ;  $AR^2 = .25$ ). The next model (model 3) added the effects of four TMT dimensions on corporate entrepreneurship. Supporting Hypotheses 4, 6, and 8, respectively, decen-

tralization of responsibilities (.26,  $p < .05$ ), risk propensity (.24,  $p < .05$ ), and long-term compensation (.34,  $p < .01$ ) were all associated with corporate entrepreneurship, but contrary to Hypothesis 2, behavioral integration was not. The four TMT characteristics explained additional significant variance in corporate entrepreneurship [ $AR^2 = .10$ ]

In model 4, the path from transformational leadership to corporate entrepreneurship was added. As shown, model 4 ( $\chi^2[499, n = 152] = 853.40, p < .001, CFI = .92, IFI = .92, TLI = .91, and RMSEA = .05$ ) was slightly superior to the more constrained model 3 ( $\chi^2[500, n = 152] = 858.57, p < .001, CFI = .91, IFI = .91, TLI = .90, and RMSEA = .06$ ). Using a two-tailed test, we found the difference in chi-squares of 5.17 ( $\Delta df = 1$ ) between the models was significant ( $p < .05$ ). This finding suggests that, in addition to having the hypothesized effects through TMT characteristics, transformational CEOs also have a direct influence on corporate entrepreneurship (.21,  $p < .05$ ;  $AR^2 = .05$ ). Figure 1 presents the path coefficients in this best-fitting model—the partially mediated model 4.

**FIGURE 1**  
**Final Model<sup>a</sup>**



<sup>a</sup> Standardized parameter estimates.  $n = 152$ . This is a simplified version of the actual model. It does not show indicators, error terms, exogenous factor variances, nor control variables. Solid arrows represent hypothesized paths; dotted arrow represents a path that was not hypothesized.

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

### Post Hoc Analyses

To further verify our findings and gain additional insight, we conducted a series of post hoc analyses. First, we tested for the possible influence of common method bias on our findings. Appendix B describes these analyses. The results suggested that our findings were not significantly influenced by such bias. Second, we reestimated the model depicted in Figure 1 by excluding CEO scores to determine whether or not our findings were sensitive to the inclusion/omission of CEO scores in our measure of the four TMT characteristics. Again, we arrived at the same pattern of significant results (results are available on request).

Our third post hoc analysis was stimulated by the suggestion in some previous research that transformational leadership may have a dark side, particularly if charisma is high. For example, Kark, Shamir, and Chen (2003) argued that a leader's high charisma may cause followers to become dependent on the leader for guidance, and Agle, Nagarajan, Sonnenfeld, and Srinivasan (2006) argued that charisma can be associated with a dysfunctional form of narcissism. Consequently, to explore this contrarian view, we tested for a possible inverse U-shaped relation-

ship between CEO transformational leadership, the four TMT characteristics, and corporate entrepreneurship using multiple regression and found no curvilinear effects (results are available on request). In addition we tested for a possible direct relationship between charisma and our model's other core constructs, but again found no significant relationships. This analysis further confirms Bass's (1985) contention that a leader can display charisma without being transformational. Moreover, a purely charismatic leader, one who leads followers by invoking blind obedience or habituated subordination, is fundamentally different from the transformational leader who encourages followers to address challenges, think creatively, and develop themselves (Avolio et al., 2004). In sum, because charisma is only a component of the multifaceted construct, we conclude that any dysfunctional consequences of charisma are likely mitigated by the other attributes of transformational leadership.

Finally, given that behavioral integration is a rather broad measure of team process, one speculative explanation for the unexpected null Hypothesis 2 finding is that this construct is not capturing the sort of

information exchange, collaboration, and joint decision making that is directly relevant to corporate entrepreneurship. To gain additional insights, we also explored the possibility of an indirect association in the form of a moderating effect. We considered this possibility in view of a remark made by Hambrick (2005), who, reflecting on recent advances made in upper echelons research, speculated as follows: "TMT characteristics will predict organizational outcomes only in proportion to the degree that TMT behavioral integration exists. That is, behavioral integration is a key moderator of the basic upper echelons Relationships" (2005: 121-122). Absent theoretical and empirical support, however, we did not formally hypothesize such relationships, but we [tested for them.

| The results are intriguing. Although behavioral Integration did not moderate the relationship between risk-taking propensity and corporate entrepreneurship or that between long-term compensation and corporate entrepreneurship, it positively moderated the relationship between decentralization of responsibilities and corporate entrepreneurship ( $p < .05$ ). A plot of the interaction term (available from the authors) revealed a more positive decentralization-corporate entrepreneurship relationship for firms with higher levels of behavioral integration (above the sample mean) than for firms with lower levels. At first glance, it appears that TMT dynamics conducive corporate entrepreneurship require both integration and decentralization elements. Behavioral integration ensures the quality and completeness of decision making and increases team members' commitment to final decisions, and decentralization allows team members sufficient authority to implement those decisions. Thus, when these two TMT characteristics are in sync, they appear to exert a significant influence on corporate entrepreneurship.

## DISCUSSION

1 Although extant research has been equivocal about the importance of CEOs in affecting firm-level outcomes, it nevertheless seemed intuitive to us that a transformational CEO plays an important role, particularly when it comes to promoting corporate entrepreneurship. Building on upper echelons research, which has documented the influence of TMTs on firm-level outcomes but has largely ignored the interface between CEO and TMT, our conceptual model positioned a firm's TMT as a pivotal intervening mechanism between a transformational CEO and corporate entrepreneurship. Our study's central question

was not if CEOs play a role (because we assumed they would), but rather, *how they* do so.

Our findings from a multisource survey of CEOs and members of their TMTs in 152 firms suggest a multifaceted answer. Specifically, we find that transformational CEOs play a significant role in directly shaping four salient TMT characteristics, including behavioral integration, decentralization of responsibilities, risk-taking propensity, and long-term compensation. In keeping with Peterson and colleagues' (2003) previous research, therefore, our findings demonstrate the distinct role played by top executives at the CEO-TMT interface. Moreover, our findings suggest that the recognition of this interface by upper echelons theorists could prove especially fruitful in further specifying their models. Along this line of thinking, it would be interesting to explore other salient CEO attributes that might shape TMT characteristics, such as the level of executive hubris that is embedded in their deeply held core self evaluations (Hiller & Hambrick, 2004).

Our findings also suggest that with the exception of behavioral integration, three TMT characteristics, decentralization of responsibilities, risk-taking propensity, and long-term compensation, were significantly linked to corporate entrepreneurship. Given that one of our study's most important findings is that TMTs are an important intervening mechanism through which the influence of transformational CEOs on corporate entrepreneurship is pronounced, future studies might build upon this idea. For example, other TMT characteristics, such as a team's entrepreneurial orientation (Lumpkin & Dess, 1996), may need to be examined to further explain transformational CEOs' impacts on corporate entrepreneurship.

In addition, since our study was only the second to isolate the CEO-TMT interface, and given the paucity of research and theory, we decided to focus on modeling main effects. Future research might address finer-grained and alternative conceptualizations of the relationships between the variables specified in our model. For example, although we did not find evidence to support a direct link between behavioral integration and corporate entrepreneurship, in our post hoc analysis we did find that behavioral integration positively moderated the influence of decentralization of responsibility on corporate entrepreneurship. Although this finding is exploratory, it does raise the broader issue for future research as to the more precise nature of the relationships between TMT characteristics and firm-level outcomes.

Our findings also showed a direct link between transformational leadership and corporate entrepreneurship, even after a CEO's shaping influence on his or her TMT is accounted for. We did

not hypothesize this link, but we nevertheless find the support for it to be intriguing. It suggests that, in addition to the CEO-TMT interface, other salient intervening mechanisms may be operating. One particularly interesting avenue might be to examine a multilevel interface model as an attempt to elaborate more fully on how a transformational CEO's shaping influence on the TMT cascades downward in a firm. Research in this vein could address such intriguing questions as these: To what extent does a transformational CEO also influence the transformational behaviors of the other TMT members? To what extent do transformational TMT members encourage and facilitate, among those reporting to them, further entrepreneurial initiatives?

Another interesting avenue might be to examine transformational CEO impact on organizational culture, which is expected to nurture creative efforts and facilitate diffusion of learning within an entire organization, as an influence mechanism apart from TMT elements. Alternatively, future researchers might also examine transformational CEO influence on recruitment and selection of employees. For example, potential employees who share the essential values and beliefs embodied in transformational leadership may be more likely to be attracted to firms whose cultural values are consistent with theirs. In turn, such employees may also be more predisposed to contribute to as well as support their firm's entrepreneurial initiatives. Clearly, future research like this, and studies using archival measures of corporate entrepreneurship, might well uncover a number of transformational CEOs' "trace effects" that, like light through a prism, further amplify the entrepreneurial proclivity of firms.

In addition to its theoretical contribution, our study has important practical implications. As Dess and Picken (2000) emphasized, the business environment in the 21st century requires organizations to be continuously innovative by harnessing the collective knowledge, skills, and creative efforts of firm members. As our findings have shown, a transformational CEO is one important driver of such outcomes. Furthermore, given that several aspects of leadership behavior can be learned or adjusted (Kirkbride, 2006), our findings suggest that organizations can improve their corporate entrepreneurship by helping CEOs to develop and display transformational leadership behaviors through training and mentoring.

We believe our findings are robust, in that we took a number of recommended steps to mitigate concerns about informant bias, nonresponse bias, common method variance, and measurement error. None of these steps suggested a bias. We are mindful, of course, that as in most examinations of firm-level

effects, facets of our research design likely limit the extent to which we can place full confidence in these results. However, given that our tests revealed no bias, we view these limits as acceptable. We were also able to rule out the possibility of charisma playing a dysfunctional role by increasing follower dependency, as some have suggested. Perhaps—as Hambrick (1994)—reasoned, senior executives in a TMT are generally more experienced and confident as well as charged with greater responsibilities than are lower-level subordinates and, therefore, TMT members are less susceptible to such influence, especially when their boss is encouraging and supportive and stimulates them to challenge assumptions and go beyond their own self-interest.

Finally, although our theoretical model implies causality, it should not be inferred because our study was correlational and did not involve the manipulation of variables. As such, the present research design cannot rule out the possibility of reverse/reciprocal causality; for example, greater corporate entrepreneurship might encourage a CEO to act more transformationally in a kind of virtuous cycle. Extant theory and research have not made this case—yet assuming one could make it, only a well-designed longitudinal study could test for it. However, even this design would be subject to concern about exogenous influences that may play a role over time. It also remains an open question as to whether or not our findings can be generalized to large firms. As noted earlier, small-to-medium sized firms differ from large ones in that they have fewer intervening levels of management and are less constrained by extraneous influences. Thus, although our findings offer a reasonable point of departure for examining large public firms, future research is needed to examine the veracity of our findings in that context. On the other hand, given that small firms represent a vital component of most nations' economies and are, by far, the most ubiquitous form of business organization in the United States, generating about 70 percent of all jobs in the country (Small Business Association, 2003), we believe our findings make a timely and relevant contribution.

In sum, this study puts CEOs back into upper echelons research by elaborating on the often ignored CEO-TMT interface and demonstrates that transformational CEOs are capable of shaping TM characteristics that are salient drivers of corporate entrepreneurship. Of course, whether or not transformational CEOs are the sine qua non of their firms' entrepreneurial proclivity remains an open, yet intriguing, question.

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## APPENDIX A

## Results of Confirmatory Factor Analysis for Measures

Constructs and Items	Factor					
	1	2	3	4	5	6
<i>Transformational leadership</i> : The extent to which a CEO . . .	.90					
Talks about his or her most important values and beliefs	.71					
Instills pride in me for being associated with him/her	.86					
Specifies the importance of having a strong sense of purpose	.84					
Goes beyond self-interest for the good of the group	.75					
Acts in ways that build my respect	.87					
Considers the moral and ethical consequences of decisions	.72					
Displays a sense of power and confidence	.60					
Emphasizes the importance of having a collective sense of mission	.83					
Talks optimistically about the future	.60					
Talks enthusiastically about what needs to be accomplished	.79					
Articulates a compelling vision of the future	.77					
Expresses confidence that goals will be achieved	.81					
Reexamines critical assumptions to question whether they are appropriate	.83					
Seeks differing perspectives when solving problems	.70					
Gets me to look at problems from many different angles	.74					
Suggests new ways of looking at how to complete assignments	.73					
Spends time teaching and coaching	.72					
Treats me as an individual rather than just as a member of a group	.66					
Considers me as having different needs, abilities, and aspirations from others	.64					
Helps me to develop my strengths	.76					

APPENDIX A  
(Continued)

Constructs and Items	Factor						
	$\alpha$	1	2	3	4	5	6
<i>Behavioral integration</i> : The extent to which TMT members . . .	.90						
Let each other know when their actions affect another team member's work			.67				
Have a clear understanding of the job problems and needs of other team members			.71				
Discuss their expectations of each other			.71				
Volunteer to help some team members, who are busy, to manage their workload			.87				
Are flexible about switching responsibilities to make things easier for each other			.88				
Are willing to help each other complete jobs and meet deadlines			.87				
Are effective in developing high quality ideas			.62				
Are effective in generating high quality solutions			.68				
Are effective in making decisions that require high levels of creativity and innovativeness			.53				
<i>Decentralization of responsibilities</i> : The extent to which a CEO decentralizes the decision making regarding . . .	.92						
Entry into new market segments				.77			
Changing policies that affect a portion of the firm				.85			
Hiring midlevel management personnel				.83			
Making capital expenditures greater than 1% of our firm's annual budget				.81			
Altering responsibilities of first-line managers				.75			
Changing the way our firm serves the customers/clients				.73			
Making changes in the way our firm produces its products/services				.73			
<i>Risk propensity</i> : The extent to which a TMT . . .	.78						
Has a strong preference for high-risk projects					.59		
Views bold acts as useful and common practice					.62		
Favors the tried and true <sup>a</sup>					-.69		
Has a tendency to follow competitors instead of introducing new products ourselves first <sup>a</sup>					-.61		
Prefers to let other firms in our industry assume the risk of product or process innovations before adopting them in our firm <sup>a</sup>					-.60		
<i>Long-term compensation</i> : The extent to which executive compensation . . .	.85						
Focuses top managers' attention on the long-term (two or more years) goals of the firm						.67	
Rewards top managers for short-term accomplishments during a fixed time period (e.g., semiannual or annual firm performance reviews) <sup>a</sup>						-.71	
Recognizes that long-term firm results are more important than short-term firm results						.74	
<i>Corporate entrepreneurship</i> : The extent to which a firm . . .	.88						
Has spent heavily (well above the industry average) on product development							.62
Has introduced a large number of new products to the market							.72
Has acquired significantly more patents than its major competitors							.66
Has pioneered the development of breakthrough innovations in its industry							.69
Has spent on new product development initiatives							.58
Has entered new markets							.71
Has established or sponsored new ventures							.73
Has found new niches in current markets							.71
Has financed start-up business activities							.59
Has created new semi and autonomous units							.58
Has changed its competitive approach (strategy) for each business unit							.62
Has recognized operations, units, and divisions to ensure increased coordination and communication among business units							.62
Has redefined the industries in which it competes							.63
Has introduced innovative human resource programs							.71
Has been first in the industry to introduce new business concepts and practices							.62

<sup>a</sup> These items are reverse-scored.

## APPENDIX B

## Addressing Common Method Bias

Given our reliance on self-reports, we took several steps to mitigate and detect potential common method bias. To *mitigate* the biasing effects, in the relationship between CEO transformational leadership and TMT characteristics, we excluded CEOs from the assessment of the former while including them for the latter. In other words, the respondents for the transformational leadership and TMT variables were partially different. Second, we collected the data for each core variable from multiple respondents rather than for a single respondent per firm. This procedure could reduce the method biases caused by respondents' individual affect or mood (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Third, we varied the scale anchors and format in the questionnaire. This way, the method biases caused by commonalities across measures were minimized (Podsakoff et al., 2003).

To further *detect* the possible influence of common method variance, we conducted several additional tests of our model. In the first test, we reassessed the model presented in Figure 1 by only utilizing responses from the CEOs on corporate entrepreneurship [ $\chi^2$  [499,  $n = 152$ ] = 868.34,  $p < .001$ , CFI = .90, IFI = .91, TLI = .90, and RMSEA = .06), and in the second test we only used responses from TMT members other than the CEO ( $\chi^2$  [499,  $n = 152$ ] = 859.12,  $p < .001$ , CFI = .92, IFI = .91, TLI = .91, and RMSEA = .05). Both tests generated results that were consistent in direction and significance with what we found when taking responses from entire TMTs inclusive of the CEOs. In the third test, following Podsakoff and colleagues' (2003) recommendation, we re-estimated the model in Figure 1 with all the indicator variables loading on a general common method factor. Results indicate that although the general common method factor did improve model fit, none of the individual path coefficients corresponding to the relationships between the indicators and the general method factor were significant. The coefficient estimates for hypothesized paths were similar to those obtained earlier. These findings are consistent with research on common method bias indicating that although method bias may be

present, it does not always significantly affect results or conclusions (Podsakoff et al., 2003). Results of these analyses are available from the authors.



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