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# A contextual examination of new venture performance: entrepreneur leadership behavior, top management team heterogeneity, and environmental dynamism

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## Summary

This study examined the relationship of entrepreneur leadership behavior (empowering and directive), top management team heterogeneity (functional, educational specialty, educational level, and skill) and industry environmental dynamism (rate of unpredicted change in number of industry establishments, number of industry employees, industry revenue, and industry research and development intensity) on new venture performance (revenue growth and employment growth) using two different samples—the *Inc.* 500 list of America's fastest growing startups and a national (United States) random sample of new ventures. In dynamic industry environments, startups with heterogeneous top management teams were found to perform best when led by directive leaders and those with homogenous top management teams performed best when led by empowering leaders. Conversely in stable industry environments, startups with heterogeneous top management teams were found to perform best when led by empowering leaders and those with homogenous top management teams performed best when led by directive leaders. These findings were consistent across both samples and demonstrate the value in a contextual approach to leadership, which considers adjusting leadership behavior in accordance to factors that are both internal and external to the firm. Copyright © 2007 John Wiley & Sons, Ltd.

## Introduction

Recently leadership has begun to garner increased attention in the entrepreneurship literature due to recognition of the fact that entrepreneurs cannot successfully develop new ventures without displaying effective leadership behavior (Bryant, 2004; Cogliser & Brigham, 2004). For example, business founders must create a vision for their firm and influence others to buy into their dreams in order to attract employees and acquire necessary resources for developing their new ventures

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(Baum, Locke, & Kirkpatrick, 1998). Further, entrepreneurs must set the initial goals and reward structures for their workers (Williamson, 2000). In the context of new venture creation, founders *must* lead because there are no standard operating procedures or organizational structures to fall back on when creating a firm from scratch. This distinction differentiates entrepreneurs from corporate managers who often have more well-defined goals, structures, and work processes to guide them (Ensley, Pearce, & Hmieleski, 2006). Thus, whereas there may be substitutes and/or blockers of leadership in larger and more established organizations (Kerr & Jermier, 1978), there are—by definition—far less alternatives or impediments to leadership in new ventures.

Although the importance of leadership in the new venture creation process has now been established (Bryant, 2004; Cogliser & Brigham, 2004; Vecchio, 2003), much detail remains to be learned about which forms of leadership behavior are most effective in this context. Further, the entrepreneurship literature discussing leadership has generally been one-sided, predominately focusing on empowering leadership behaviors (Covin & Slevin, 2002, 2004; Gupta, MacMillan, & Surie, 2004; Ireland, Hitt, & Sirmon, 2003; McGrath & MacMillan, 2000), while generally failing to acknowledge conditions in which other behaviors such as directive leadership may also be advantageous. This outlook is symptomatic of a general trend in the entrepreneurship literature to seek out ‘one-best-way’ models of entrepreneurial behavior that fail to consider the full complexity of the new venture context (Gartner, 1989; Shaver & Scott, 1991). It has been suggested that by failing to develop more sophisticated cross-level models of entrepreneurial performance, the field of entrepreneurship will struggle to reach the stature of more established areas of management research such as organizational behavior and strategic management (Davidsson & Wiklund, 2001; Low & MacMillan, 1988). To this end, potential for advancing entrepreneurship research appears to exist in importing theory from organizational behavior (Baron, 2002) and strategic management (Hitt & Ireland, 2000; Sandberg, 1992) to build cross-level models of new venture performance.

The current study follows such an approach by developing and empirically examining a contextual model that considers how entrepreneur leadership behavior interacts with factors both internal and external to the new venture (see Figure 1). For the purpose of our study, we define entrepreneurs as individuals who are both founders and top management team leaders of their firms. Research has shown that, although new ventures are often formed by founding teams, one individual typically emerges as the leader (Ensley, Carland, & Carland, 2000). Entrepreneur leadership behavior is considered in terms of empowering and directive leader behaviors. These facets of leadership are selected for study because

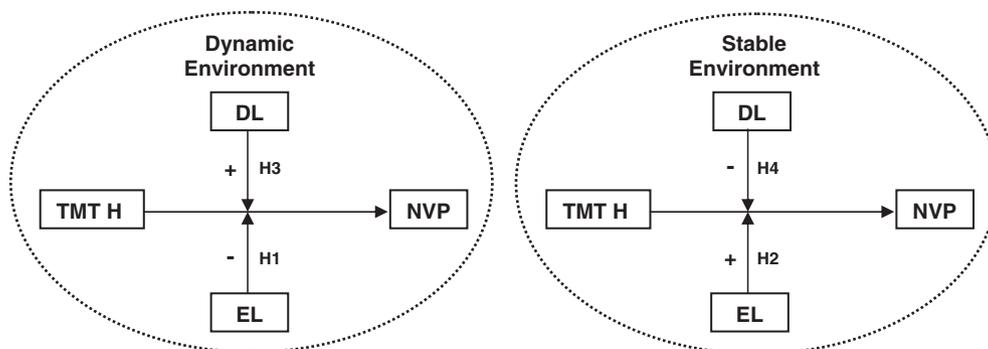


Figure 1. The interaction effects of empowering and directive leadership behavior, top management team heterogeneity, and industry environmental dynamism on new venture performance. *Note:* DL, Directive Leadership; EL, Empowering Leadership; TMT H, Top Management Team Heterogeneity; NVP, New Venture Performance

they characterize basic, distinct, and contrasting elements of leadership that are highly agreed upon within the mainstream literature; as opposed to, for example, transformational and transactional leadership (Rafferty & Griffin, 2004), which have been viewed by some as less distinct conglomerations of various leadership behaviors (Yukl, 1999).

In terms of factors internal to the startup, we consider the heterogeneity of new venture top management team composition. Specifically, we examine the extent to which new venture top management team members differ in educational level and specialization (Jackson et al., 1991), general business skills (Carpenter, 2002), and functional expertise (Carpenter & Fredrickson, 2001). Top management team composition is considered because of the influence that this factor has been demonstrated to have on new venture performance (Ucbasaran, Lockett, Wright, & Westhead, 2003), as well as the degree to which it has been shown to moderate the effectiveness of leadership behavior (Fiedler & Garcia, 1987). For example, Ensley and Hmieleski (2005) found new venture top management team heterogeneity in terms of education, functional expertise, industry experience, and business skills to share a significant positive relationship with the net cash flow and sales growth of their firms using a sample of 256 startups. Due to the wide array of roles and tasks that new venture top management teams must take on, it is important that their members have a diverse range of backgrounds and expertise. There is less room in this regard for duplication within startups than in larger, more established firms. Further, leadership within heterogeneous teams is generally more effective than that of homogenous team, because diverse teams have a greater variety of information sources to draw from and are likely to make more comprehensive strategic decisions (Mello & Ruckes, 2006). This situation tends to especially hold true within complex environments and for ambiguous tasks (Greening & Johnson, 1996), both of which tend to be inherent within the new venture development process (Baron, 1998). As Amason, Shrader, and Tompson (2006) note, however, there are also occasions when top management team heterogeneity might negatively relate to performance, such as in situations whereby consensus and quality of communication are more important than information seeking and decision comprehensiveness. Thus, the value of top management team heterogeneity appears to be partly context dependent.

Finally, the external environment is considered in terms of environmental dynamism, which is defined as the rate of unpredicted change within the industry that the startup operates (Dess & Beard, 1984). Specifically, we examine the rate of unpredicted change in number of industry establishments, number of industry employees, industry revenue, and industry research and development intensity. Environmental dynamism has been shown to be an important moderator of both the linkage between top management team heterogeneity and performance (Hambrick & Mason, 1984) and the linkage between leadership behavior and performance (Waldman, Ramirez, House, & Puranam, 2001). For example, in their study of 98 executives from 34 firms, Lumpkin and Dess (1995) found simple strategy making, a decision-making outcome most commonly associated with homogeneous teams, to be most effective in stable rather than dynamic environments. Further, using a sample of 66 startups from the *Inc. 500*, Ensley et al. (2006) found environmental dynamism to significantly moderate the relationships of transformational and transactional leadership with new venture sales growth, such that transformational leadership was most effective in dynamic environments and transactional leadership was most effective in stable environments. Interestingly, although top management team heterogeneity and environmental dynamism have been shown separately to moderate the effectiveness of leadership behavior, we have not identified any empirical investigations in the organizational behavior, strategic management or entrepreneurship literatures that have considered the joint interaction between these three factors. Therefore, the results of the current study are expected to provide reciprocal advancement to each of these areas of management research.

In the following sections, we review how empowering and directive entrepreneur leadership behaviors are likely to differentially interact with top management team heterogeneity and industry

environmental dynamism on new venture performance. The hypothesized relationships are then tested using a sample drawn from the *Inc.* 500 list of America's fastest growing startups and a national (United States) random sample of new ventures. Finally, implications for the findings are discussed.

## Entrepreneur Leadership Behavior

In this section, we consider how empowering and directive leadership behavior of lead entrepreneurs interacts with top management team heterogeneity and industry environmental dynamism to impact new venture performance.

### *Empowering leadership behavior*

Empowering leadership behavior encompasses the encouraging of self-rewards, self-leadership, opportunity thinking, participative goal-setting, and independent behavior by followers, subordinates, or group members (Pearce et al., 2003). Empowering leadership has been found to positively influence perceptions of meaning, self-efficacy, team potency, and self-determination (Spreitzer, 1996). Through positive emotional support and encouragement, empowering leaders tend to increase the motivation and confidence of subordinates toward the accomplishment of individual and organizational goals (Conger, 1989). To this end, empowering leadership should be a particularly useful behavioral tactic for entrepreneurs who must gain extraordinary commitment from their top management teams in order to compete against more established and resource-rich incumbents (Ensley, Pearson, & Pearce, 2003).

In addition, entrepreneur empowering leadership behavior is likely to be especially important within dynamic environments. For example, Nicholls-Nixon (2005) suggests that entrepreneurs attempting to lead their startups toward high growth while operating under dynamic conditions are likely to benefit from adopting an empowering leadership style, noting that (p. 84) 'Rather than deciding *a priori* the direction of growth and the formal structures and systems needed to manage it, the leader's role is to create the conditions that allow self-organizing behavior to emerge'. This view is congruent with complexity theories of leadership, which consider how leadership behaviors enable, rather than guide, organizational effectiveness under uncertainty (Marion & Uhl-Bien, 2001). Therefore, empowering leadership appears to be an effective method to distribute leadership throughout the top management team so as to promote emergent strategy formation that takes advantage of the talents of the individual team members that are most congruent with the environment in the current moment (Pearce, 2004).

There are, however, also potential negative effects of empowering leadership, which have generally received less attention within the leadership literature. Relevant to the current study, empowering heterogeneous teams can sometimes prove to be counterproductive (Gebert & Boerner, 1999). For example, a study by Gebert, Boerner, and Lanwehr (2003) found that empowering leadership can drive the undertaking of a dysfunctional quantity, intensity, and incompatibility of innovative initiatives. Further, empowered top management teams can sometimes seek to acquire too much information before moving forward, or attempt to exploit too many opportunities without refining a single business concept that can be used to establish a foothold in the marketplace. These problems are likely to be most often experienced by startups with heterogeneous top management teams, which tend to be more innovative than their more homogenous counterparts (Bantel & Jackson, 1989; Elenkov, Judge, & Wright, 2005).

Although heterogeneous teams are particularly effective at considering multiple alternatives and making sense of ambiguous situations, they are slower to reach consensus on decisions (Pfeffer, 1983). This outcome often results from the fact that diverse perspectives within top management teams can produce conflict and slow down the decision-making process (Amason, 1996). Due to this fact, commitment and morale tend to be lower within heterogeneous teams (Jehn, Northcraft, & Neale, 1999). By empowering heterogeneous top management teams, lead entrepreneurs are likely to provide greater opportunity for such conflict to emerge. Further, conflict amongst team members is likely to be particularly detrimental to the performance of startups operating in dynamic environments, where decisions need to be made quickly, before missing out on brief windows of opportunity (Kirzner, 1997). This leads to our first set of hypotheses:

*Hypothesis 1a:* Under high industry environmental dynamism, empowering entrepreneur leadership behavior will reduce the effects of top management team heterogeneity on new venture performance, such that the relationship between top management team heterogeneity and new venture performance will become increasingly negative as empowering leadership increases.

*Hypothesis 1b:* Under high industry environmental dynamism, empowering entrepreneur leadership behavior will enhance the effects of top management team homogeneity on new venture performance, such that the relationship between top management team homogeneity and new venture performance will become increasingly positive as empowering leadership increases.

In more stable industry environments, we argue that empowering leadership behavior is likely to have a more positive effect on the performance of startups with heterogeneous top management teams than in dynamic industry environments. In this context, information is less ambiguous and time available for strategizing is more plentiful. This situation allows empowered top management teams to spend more time considering alternative strategies and exploring the potential for various innovative activities, because it is not important for consensus and unified action to be taken as quickly (Cox, Lobel, & McLeod, 1991). As a result, there is likely to be less conflict within empowered heterogeneous teams operating in stable environments. Further, the high quality of information available within stable environments allows heterogeneous teams to capitalize on their ability to engage in rational strategic planning (Stone & Brush, 1996). This type of planning enables empowering leaders to more fully capitalize on the benefits of top management team heterogeneity and incorporate diverse views into their firm's strategy-making processes (Simons, 1995). Therefore, we offer our next set of hypotheses:

*Hypothesis 2a:* Under low industry environmental dynamism, empowering entrepreneur leadership behavior will enhance the effects of top management team heterogeneity on new venture performance, such that the relationship between top management team heterogeneity and new venture performance will become increasingly positive as empowering leadership increases.

*Hypothesis 2b:* Under low industry environmental dynamism, empowering entrepreneur leadership behavior will reduce the effects of top management team homogeneity on new venture performance, such that the relationship between top management team homogeneity and new venture performance will become increasingly negative as empowering leadership increases.

### *Directive leadership behavior*

Directive leadership behavior is the process through which leaders instruct and command followers to carry out designated tasks, assign specific non-negotiable goals, and use contingent reprimands to facilitate cooperation from followers, subordinates, or group members (Pearce et al., 2003). The leadership literature has primarily focused on the negative, rather than positive, effects of directive leadership (e.g., Cruz, Henningsen, & Smith, 1999; Larson, Foster-Fishman, & Franz, 1998; Moorhead & Montanari, 1986). There are, however, several noteworthy benefits of directive leadership behavior (Muczyk & Reimann, 1987), especially within startups operating in dynamic industry environments and having heterogeneous top management teams.

Perhaps most relevant to the current study, directive leadership can help facilitate the formation of a collective vision by heterogeneous top management teams (Mumford, Feldman, Hein, & Nagao, 2001; Shalley & Gilson, 2004). Ensley and Pearce (2001) have argued that the collective vision of new venture top management teams is one of the most important determinants for the survival and growth of startups. These positive effects are partly due to the fact that unified teams are more readily able to make fast decisions. Numerous studies have identified a positive linkage between strategic decision speed and firm performance within dynamic industry environments (Baum & Wally, 2003). Here we refer back to the work of Eisenhardt (1989), who demonstrated that it is not simply the speed of decision making that is important within dynamic environment, but rather the speed at which comprehensive decisions are able to be made. Even though within dynamic environments heterogeneous teams may not have the time that they would like in order to fully examine various decision options, their diversity alone should provide for greater comprehensiveness in strategic decisions-making—even when directive leaders force quick decisions to be made—than that of their more homogeneous counterparts. Further, directive leaders who do not invite team members to actively participate in strategic decision-making may still call on the diverse knowledge of heterogeneous top management team members to provide them with information used to make important decisions. To this end, we suggest that the combination of top management team heterogeneity and directive leadership should result in strategic decision comprehensiveness and speed, leading to high performance within dynamic industry environments. Thus, we present our next set of hypotheses:

*Hypothesis 3a:* Under high industry environmental dynamism, directive entrepreneur leadership behavior will enhance the effects of top management team heterogeneity on new venture performance, such that the relationship between top management team heterogeneity and new venture performance will become increasingly positive as directive leadership increases.

*Hypothesis 3b:* Under high industry environmental dynamism, directive entrepreneur leadership behavior will reduce the effects of top management team homogeneity on new venture performance, such that the relationship between top management team homogeneity and new venture performance will become increasingly negative as directive leadership increases.

Conversely, directive leadership of heterogeneous top management teams may have more deleterious effects (Glick et al., 1993; Priem, Rasheed, & Kotulic, 1995). This is because directive leadership can inhibit top management teams from the consideration of diverse perspectives (Larson et al., 1998; Moorhead & Montanari, 1986). In stable environments there is less need to quickly reach a consensus on strategic decisions. While directive leadership may be necessary to bring together the diverse views of heterogeneous teams within dynamic environments, leaders can afford to be more flexible and allow for diverse views to incubate and emerge without having to force a plan onto the

team. In fact, within stable environments, heterogeneous teams may view directive leadership as unnecessary and prefer instead for strategic decisions to be made by the group (Kahai, Sosik, & Avolio, 1997). As a result, directive leadership may cause unnecessary conflict for heterogeneous new venture top management teams of startups operating within stable industry environments. This is likely to be less of a problem within homogenous top management teams which are more likely to have a unified view that is already in alignment with the leader (Larson et al., 1998). Therefore, we offer our final set of hypotheses:

*Hypothesis 4a:* Under low industry environmental dynamism, directive leadership behavior will reduce the effects of top management team heterogeneity on new venture performance, such that the relationship between top management team heterogeneity and new venture performance will become increasingly negative as directive leadership increases.

*Hypothesis 4b:* Under low industry environmental dynamism, directive leadership behavior will enhance the effects of top management team homogeneity on new venture performance, such that the relationship between top management team homogeneity and new venture performance will become increasingly positive as directive leadership increases.

In summary, we expect that empowering leadership will reduce the effects of top management team heterogeneity on performance within dynamic environments and enhance the effects of top management team heterogeneity on performance within stable environments. Conversely, we anticipate that directive leadership will enhance the effects of top management team heterogeneity on performance within dynamic environments and reduce the effects of top management team heterogeneity within stable environments. In the following section, we describe the methodology that was used to examine these relationships.

## Organizational Context

### Organizational Factors

Given our focus on the leadership of new ventures, we gathered data from the top management teams from the *Inc.* 500 list of America's fastest growing startups and a national random sample of firms drawn Dun and Bradstreet. Dun and Bradstreet compiles what is considered to be the most exhaustive database of young firms founded in the United States. Thus, a random sample of firms drawn from their database—although not a completely random sample—is arguably as close of a random sample of startups as can be feasibly drawn. The *Inc.* 500 sample is drawn from a list of the 500 fastest growing American-based startups and is published annually. Because the *Inc.* 500 consists typically of small firms, in relatively early stages of their development, it seemed an appropriate sample for study. The national random sample was generally younger, had not grown as fast, but still had substantial growth rates and intent to grow and create inordinate wealth. Firms in both samples were still highly dependent upon the vision and direction of their top management.

**Worker-Job Factors**

Since the firms from both samples were in the early stages of the organizational lifecycle, the work environments within these companies could be generally characterized as weak. This is because work processes and procedures are still being developed. Similarly, distinctive organizational cultures are not yet likely to have become institutionalized within most of these firms, although it is likely that norms are beginning to take shape at this point of their development.

Due to the extreme growth of the *Inc.* 500 sample, the internal environment for these firms is likely to be highly turbulent. Startups from the national random sample are also likely to experience turbulent internal conditions, but partly for different reasons. These firms are not as far along in the organizational life cycle and are working hard to gain traction within their industries, whereas the *Inc.* 500 firms have already gained traction and are beginning to run, very quickly.

**External Environment**

All participants from each sample were from firms based in the United States. These firms came a wide range of industries. Some examples include single-family housing construction, management consulting services, and computer-related services. Since industry-level dynamism is used as a moderator variable in the current study, it was important to sample firms across a wide range of industries. Although many simply consider the new venture context to be dynamic in general (Baron, 1998), research has shown variation in industry-specific dynamism to be an important moderator of the relationship between entrepreneur leadership behavior and new venture performance (Ensley et al., 2006).

**Time**

The *Inc.* 500 list is developed annually, and the 1999 list was used in this study. The national random sample was drawn from Dun and Bradstreet in 2001. Data were collected from participating firms in the same year that the samples were drawn. Accordingly, there was a 2-year difference in the collection of data between the two samples.

**Method***Sample and procedure*

Descriptions of both samples used in this study are given below. Top management team members for the firms from both samples were mailed identical packets, containing a cover letter, survey, and business reply envelope. Respondents were asked to complete the survey and returned it in the supplied pre-paid envelope. Performance data were acquired from *Inc. Magazine* and Dun and Bradstreet. Brief follow-up telephone interviews were conducted with the firms' CEOs in order to confirm the performance data as well as their role as top management team leaders.

*Inc. 500 sample*

Each of the 1142 officers of the 500 firms received a personalized letter and individually numbered questionnaire. Individual names and addresses for the top management team members were obtained

from the Dun and Bradstreet Market Identifiers database. Of the 1142 questionnaires mailed, we received 168 usable responses from top management team members of 66 firms, a response rate of 13.2 percent. This provided us with an average of 2.5 respondents per top management team. Further, we received completed responses from at least two members for each top management team of the 66 firms. Responses of the participants within each firm were aggregated to create our test variables. Non-response bias was examined by conducting *t*-tests on strategic orientation, firm age, revenue, number of employees, and firm growth. All yielded non-significant results.

Of the 168 respondents, 93 percent were male and the average age was 37.2 years ( $SD = 6.4$ ). Seventy-four percent were founders and 82 percent held at least 10 percent equity in their firm. Ninety percent considered themselves entrepreneurs and 34 percent had been involved in a new venture previously. During the 5 years prior to the data collection, the average rate of growth for these firms was 1623 percent per year ( $SD = 1357$  percent) and ranged from 634 to 10434 percent. A total of 38 industries were represented, and the age of the firms ranged from 5 to 7 years, with an average of 5.6 years ( $SD = 2.2$ ).

### *National random sample*

A sample of 500 startups was randomly drawn from Dun and Bradstreet. Of the 1242 questionnaires mailed to these firms, a total of 417 usable responses from 154 firms were returned, a response rate of 30.8 percent. This provided us with an average of 2.7 respondents per top management team. Further, we received completed responses from at least two members for each top management team of the 154 firms. Once again, responses of the participants within each firm were aggregated to create our test variables. Non-response bias was again examined by conducting *t*-tests on strategic orientation, firm age, revenue, number of employees, and firm growth. All yielded non-significant results.

Of the 417 top management team members, approximately 88 percent were male and the average age was 44.2 years ( $SD = 5.7$ ). Sixty-eight percent were founders and 71 percent held at least 10 percent equity in their firm. Nearly 90 percent considered themselves entrepreneurs and 47 percent had been involved in new ventures previously. During the 5 years prior to the data collection, the average rate of growth for these firms was 41 percent per year ( $SD = 29$  percent) and ranged from 21 to 114 percent. A total of 59 industries were represented and the average firm age was 4.3 years ( $SD = 1.4$ ).

### *Measures*

#### **Leadership behavior**

Using scales from Pearce and Sims (2002), we examined four sub-dimensions each of both directive and empowering entrepreneur leadership behavior. For directive leadership, the sub-dimensions were instruction and command, assigns goals, active management by exception, and contingent reprimand. For empowering leadership, the sub-dimensions included encourages opportunity thinking, encourages self-reward, encourages independent action, and participative goal setting. Participants placed their response to each set of statements regarding the behavior of their top management team leader on a 5-point Likert-type scale that ranged from Strongly Disagree to Strongly Agree. For both directive and empowering leadership dimensions, the mean of the individual responses within each new venture top management team was used as the study variable. Once the study variables were constructed, separate indices of directive and empowering leadership were formed using summations. For the current study, Cronbach's coefficient alphas were 0.81 and 0.77 for the directive leadership index and 0.76 and 0.73 for the empowering leadership index for the *Inc.* 500 sample and national random sample, respectively.

To justify the creation of these indices from team mean variables, assessments of inter-rater reliability were conducted. For both the directive and empowering sub-dimensions, the level of within-team agreement was assessed before the individual measures were combined to form study variables (Amason, 1996; Smith et al., 1994). We used the reliability within groups on  $j$ -number of items procedure, known as the  $r_{WG(j)}$  (James, Demaree, & Wolf, 1993). The  $r_{WG(j)}$  produces a value between 0 and 1.0, with scores above 0.70 typically denoting acceptable agreement. The  $r_{WG(j)s}$  were 0.76 and 0.78 for the directive leadership index and 0.73 and 0.79 for the empowering leadership for the *Inc.* 500 sample and national random sample, respectively. Thus, for both samples there was acceptable agreement within the top management teams as to the use of directive and empowering leadership behaviors.

### Top management team heterogeneity

Heterogeneity was measured on four dimensions. The first three were categorical variables and included functional specialty, educational specialty, and educational level, which were each reported by the respondent as part of the survey. Blau's (1977) categorical index was used to form a separated heterogeneity index for each of these variables. The formula for calculating the index is as follows:

$$\text{Blau's Categorical Index} = 1 - \sum \pi_i^2$$

where  $\pi_i$  is the proportion of the population in a given group. The use of this procedure resulted in an individual team heterogeneity score ranging from 0 (completely homogeneous) to 1 (completely heterogeneous) for each of the three categorical variables.

The fourth variable, managerial skills, was measured using an instrument developed by Herron (1990), based on the work of Katz (1974) and Szilagyi and Schweiger (1984). This seven-item measure requires respondents to rate their skill level with regard to product design, industry analysis, organizational design, motivating employees, creating a sphere of influence, planning and administration, and discovering opportunities. Each item uses a Likert-type scale with anchors ranging from (1) Not Effective to (5) Extremely Effective. The Cronbach's coefficient alpha for the measure was 0.76 for the *Inc.* 500 sample and 0.84 for the national random sample. The coefficient of variation, defined as the standard deviation divided by the mean, was used as the calculation of within team variation for the Herron (1990) skills measure. Similar to Blau's categorical index, the coefficient of variation also has a theoretical range of 0 (completely homogenous) to 1 (completely heterogeneous).

Finally, to create an overall index of team heterogeneity, we summed Blau's categorical index scores for functional specialty, educational specialty, and educational level with the coefficient of variation scores for the managerial skills measure. Thus, the scores for the final index were able to range from 0 (completely homogenous) to 4 (completely heterogeneous).

### Environmental dynamism

The industry level rate of unpredicted change was measured as the standard errors of four regression slopes following the work of Dess and Beard (1984), Keats and Hitt (1988), Sharfman and Dean (1991), and Castrogiovanni (2002). In each case the independent variable was time. The dependent variables were industry revenues, number of industry establishments, number of industry employees, and research and development intensity:

$$\begin{aligned} ir_t &= b_0 + b_1(t) + a_t \\ e_t &= b_0 + b_1(t) + a_t \\ est_t &= b_0 + b_1(t) + a_t \\ rd_t &= b_0 + b_1(t) + a_t \end{aligned}$$

where  $y_t$  = time,  $ir$  = total industry revenues,  $e$  = total industry employees,  $est$  = number of industry establishments,  $rd$  = research and development intensity, and  $a$  = the residual in each regression. Industry revenue has been used as a measure of uncertainty in prior studies (e.g., Keats & Hitt, 1988; Sharfman & Dean, 1991), and number of employees is a common measure of change for use in research involving small and closely held businesses. The number of establishments has been used by Aldrich (1979) as the basis for understanding industry size and the extent of industry change. Finally, industry wide research and development intensity is a variable that captures the speed of technological evolution of the industry (Castrogiovanni, 2002; Dess & Beard, 1984).

Each of these variables was regressed with a dummy variable for 10 years of data. The standard error of the regressions (i.e., the part of the regression that the general linear model is not able to predict) divided by the mean of the respective variable was the measure of market, establishments, employee, and technological instability. Following the logic set out by Sharfman and Dean (1991) the calculation of the dynamism variable was as follows:

$$\text{Dynamism} = Z(\text{MI} + \text{NEI} + \text{NESTI}) + Z(\text{TI}) + 10$$

where MI is equal to market instability, NEI is equal to number of employees instability, NESTI is equal to the number of establishments instability, and TI is equal to technological instability. Market instability, establishments' instability, and number of employees' instability were found to be statistically related and were summed to eliminate multicollinearity. Standardized scores were used to ensure that all measures were on the same metric. The constant was added to assure that the measures were positive.

### **New venture performance**

Growth is often cited as the most important objective of new ventures (Brush & Vanderwerf, 1992). In this vein, we used two different objective measures of growth: revenue growth and employment growth. The performance data were acquired from *Inc. Magazine* and Dun and Bradstreet, which were reported as average annual revenue and employee growth rates over the most recent 3-year period. Following previous work, we formed an index of new venture growth by standardizing and then summing revenue and employee growth measures (Keats & Hitt, 1988; McGuire, Schneweis, & Hill, 1986). The creation of this index allowed for a more parsimonious presentation of the results. Considering the high correlation between revenue and employment growth (*Inc. 500* sample:  $R = 0.54$ ,  $p < 0.01$ ; national random sample:  $R = 0.61$ ,  $p < 0.01$ ) in conjunction with the fact that we observed similar results when testing our hypotheses using these variable as separate performance indicators for each sample, this approach seemed warranted.

### **Control variables**

Firm age, revenue, and top management team size were used as control variables. Firm age was the age of the firm as reported in the Dun and Bradstreet database and *Inc. Magazine*. Revenue was the natural log of the current year sales totals. Top management team size was the number of executives in the top management team.

### *Confirmatory factor analysis of independent variables*

To examine the within and between statistical structure of our independent variables, we conducted a four-factor confirmatory analysis in LISEREL 8.7 using the indicators for directive leadership, empowering leadership, top management team heterogeneity, and industry environmental dynamism. The analysis was run using the data from the national random sample. The Chi-square for the model

was non-significant ( $\chi^2(48) = 24.96, p > 0.10$ ) and results from absolute fit (GFI = 0.92), parsimony fit (RMSEA = 0.06), and relative fit (CFI = 0.91) indices each demonstrated good fit. In addition, there were no single modification indices over 3.84. The factor loadings ranged from 0.31 to 0.83 for directive leadership (12 indicators), 0.41–0.68 for empowering leadership (12 indicators), 0.57–0.93 for top management team heterogeneity (4 indicators), and 0.19–0.81 for environmental dynamism (4 indicators). These findings suggest that the within and between statistical structure for each of the independent constructs is sound. Overall, we can say that the measures of leadership, team heterogeneity, and dynamism demonstrated strong construct validity, in that each of the *a priori* indicators loaded clearly onto their appointed constructs.

### *Temporal integrity of the data*

In addition, we worked diligently to assure the temporal integrity of the data. Following Mitchell and James (2001), we gathered task environment data that corresponded directly to the point in time at which the surveys were administered. The CEOs for each of the firms were contacted and documentation of the firm's continued performance after the survey was administered was gathered within 60 days of survey administration. Performance data from both samples were used as a starting point from which we later updated through interviews with the CEOs. Significant differences were not found between the data published in *Inc. Magazine*, the Dun and Bradstreet database, and our updates. The environmental data were gathered for the exact time period of the survey. Therefore, the temporal integrity of the data is intact.

### *Statistical procedures*

Hierarchical moderated regression analysis was utilized in this study as the main statistical procedure. All interactions were graphed and, using the procedure developed by Aiken and West (1991), the significance of the simple slopes was tested. These focused tests enabled us to better interpret the meaning of the interactions.

## **Results**

Tables 1 and 2 provide means, standard deviations, and bi-variate correlations of the variables for the *Inc. 500* sample and national random sample, respectively. Cronbach's coefficient alphas for the variables are listed in parentheses across the diagonals. The hierarchical moderated regression models for each sample are displayed in Tables 3 and 4. The three-way interactions on new venture performance for the national random sample are illustrated in Figures 2 and 3. To conserve space, the three-way interactions for the *Inc. 500* sample are not shown. These graphs did, however, produced similar patterns to those that are shown. The slopes are graphed at 1 standard deviation above and below the mean of the dimension stated along the horizontal axis for each figure. The results of the simple slope tests for each of the three-way interactions can be found in Table 5.

As shown in Tables 3 and 4, each of the three-way interactions is found to be significant for both samples. Specifically, the three-way interaction account for 19 and 20 percent of the variance in new venture performance beyond the control variables, main effects, and two-way interactions for the *Inc. 500* sample and national random sample, respectively. We now consider the simple slopes of the

Table 1. Descriptive statistics and variable intercorrelations for the *Inc.* 500 sample

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Firm age	5.60	2.20														
2. Log employees	4.02	0.52	0.09													
3. Team size	3.42	0.61	0.08	0.05												
4. Dynamism	.55	0.84	0.01	-0.02	0.01	(0.68)										
5. Heterogeneity	1.14	0.71	0.12	-0.23**	0.31**	0.12	(0.52)									
6. Empowering	3.42	1.46	0.04	-0.42**	0.11	0.11	0.06	(0.76)								
7. Directive	3.28	0.77	0.01	0.21**	0.08	0.08	0.09	0.51**	(0.81)							
8. Dynamism × heterogeneity	.92	0.78	0.03	0.22**	-0.31**	0.82**	-0.06	-0.57**	0.13							
9. Dynamism × empowering	1.82	0.58	0.06	0.31**	0.15*	0.34**	0.03	0.71**	0.24**	0.44**						
10. Dynamism × directive	2.31	0.62	0.04	-0.44**	-0.12	0.27**	0.05	0.29**	0.61**	0.41**	0.36**					
11. Heterogeneity × empowering	3.45	1.84	0.06	0.34**	0.07	0.11	0.47**	0.54**	0.24**	0.47**	0.51**	0.13				
12. Heterogeneity × directive	3.37	1.68	0.02	-0.26**	-0.04	-0.14	0.44**	0.15	0.56**	0.32**	0.14	0.38**	0.46**			
13. Empowering × heterogeneity × dynamism	2.17	0.79	0.01	-0.18*	0.02	0.34**	0.57**	0.51**	0.10	0.27**	0.53**	0.24**	0.61**	0.29**		
14. Directive × heterogeneity × dynamism	2.06	0.58	0.07	0.21**	0.05	0.43**	0.37**	-0.44**	0.57**	0.49**	0.16*	0.63**	0.14	0.46**	0.52**	
15. New venture performance	3.24	0.51	0.06	0.24**	0.06	-0.20**	-0.14*	-0.21**	0.23**	0.19*	0.31**	-0.27**	0.24**	-0.31**	-0.26**	0.34**

\**p* < .05; \*\**p* < .01.

Table 2. Descriptive statistics and variable intercorrelations for the national random sample

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Firm age	4.30	1.40														
2. Log revenues	3.21	0.78	0.07													
3. Team size	3.27	0.91	0.06	0.02												
4. Dynamism	0.53	0.79	0.01	0.01	0.01	(0.68)										
5. Heterogeneity	0.93	0.71	0.09	-0.29**	0.23**	0.07	(0.54)									
6. Empowering	3.24	1.27	0.02	-0.27**	0.08	0.08	0.02	(0.73)								
7. Directive	3.61	0.61	0.03	0.18	0.03	0.03	0.07	0.41**	(0.77)							
8. Dynamism × heterogeneity	0.79	0.57	0.01	0.17	-0.25**	0.77**	-0.04	-0.42**	0.09							
9. Dynamism × empowering	1.56	0.58	0.03	0.24**	0.06	0.29**	0.01	0.59**	0.31**	0.34**						
10. Dynamism × directive	1.98	0.71	0.02	-0.31**	-0.09	0.22**	0.02	0.24**	0.58**	0.37**	0.31**					
11. Heterogeneity × empowering	2.91	1.69	0.02	0.22*	0.02	0.08	0.38**	0.47**	0.17	0.43**	0.54**	0.09				
12. Heterogeneity × directive	3.64	1.91	0.02	-0.17*	0.01	-0.06	0.35**	0.09	0.46**	0.34**	0.10	0.34**	0.51**			
13. Empowering × heterogeneity × dynamism	1.94	0.84	0.01	-0.11	0.01	0.29**	0.42**	0.38**	0.08	0.24**	0.57**	0.18	0.57**	0.37**		
14. Directive × heterogeneity × dynamism	2.34	0.64	0.01	0.14*	0.03	0.36**	0.31**	-0.32**	0.43**	0.56**	0.11	0.67**	0.04	0.44**	0.46**	
15. New venture performance	2.94	0.38	0.01	0.26**	0.06	-0.16*	-0.09	-0.32**	0.19*	0.23**	0.36**	-0.29**	0.25**	-0.28**	-0.33**	0.30**

\**p* < 0.05; \*\**p* < 0.01.

Table 3. Hierarchical regression model of new venture performance for *Inc.* 500 sample

Variable	New venture performance			
	Model 1	Model 2	Model 3	Model 4
	$\beta$	$\beta$	$\beta$	$\beta$
Firm age	0.02	0.02	0.01	0.01
Total revenues (LOG)	0.26**	0.21*	0.17*	0.13
Team size	0.21*	0.17*	0.13	0.09
Dynamism		-0.41**	-0.38**	-0.36**
TMT heterogeneity index		-0.33**	-0.29**	-0.27**
Directive leadership index		0.22**	0.20**	0.17**
Empowering Leadership Index		-0.34**	-0.29**	-0.25**
Dynamism $\times$ heterogeneity			0.54**	0.47**
Dynamism $\times$ directive			-0.24**	-0.21*
Dynamism $\times$ empowering			0.58**	0.51**
Heterogeneity $\times$ directive			-0.48**	-0.43**
Heterogeneity $\times$ empowering			0.61**	0.56**
Heterogeneity $\times$ dynamism $\times$ directive				0.81**
Heterogeneity $\times$ dynamism $\times$ empowering				-0.63**
<i>F</i> -change		2.11	2.88	4.70
$\Delta R^2$		0.09**	0.16**	0.19**
<i>F</i> -ratio	4.59**	6.71**	9.59**	14.29**
<i>R</i> <sup>2</sup>	0.19	0.28	0.44	0.63

\* $p < 0.05$ ; \*\* $p < 0.01$ .

interactions in order to evaluate the individual hypotheses (See Figure 2 and Table 5). This approach provides a more focused assessment of the interactions.

Hypothesis 1a stated that under high industry environmental dynamism, empowering entrepreneur leadership behavior will reduce the effects of top management team heterogeneity on new venture performance, such that the relationship between top management team heterogeneity and new venture performance will become increasingly negative as empowering leadership increases. Conversely, hypothesis 1b stated that under high industry environmental dynamism, empowering entrepreneur leadership behavior will enhance the effects of top management team homogeneity on new venture performance, such that the relationship between top management team homogeneity and new venture performance will become increasingly positive as empowering leadership increases. Figure 2 demonstrates that, within high dynamism environments, empowering leadership of heterogeneous top management teams has a negative effect on new venture performance and that empowering leadership of homogeneous top management teams has a positive effect on new venture performance. As shown in Table 5, the simple slope for empowering leadership of heterogeneous teams within high dynamism environments is negative and significant for the both the *Inc.* 500 sample ( $\beta = -0.19$ ,  $p < 0.05$ ) and national random sample ( $\beta = -0.21$ ,  $p < 0.05$ ). In contrast, the simple slope for empowering leadership of homogenous teams within high dynamism environments is positive and significant for both the *Inc.* 500 sample ( $\beta = 0.33$ ,  $p < 0.01$ ) and national random sample ( $\beta = 0.19$ ,  $p < 0.05$ ). Therefore, the results support hypotheses 1a and 1b.

Hypothesis 2a stated that under low industry environmental dynamism, empowering entrepreneur leadership behavior will enhance the effects of top management team heterogeneity on new venture performance, such that the relationship between top management team heterogeneity and new venture performance will become increasingly positive as empowering leadership increases. Conversely,

Table 4. Hierarchical regression model of new venture performance for national random sample

Variable	New venture performance			
	Model 1	Model 2	Model 3	Model 4
	$\beta$	$\beta$	$\beta$	$\beta$
Firm age	0.04	0.04	0.02	0.01
Total revenues (LOG)	0.22**	0.18*	0.15	0.09
Team size	0.17*	0.14	0.10	0.06
Dynamism		-0.44**	-0.41**	-0.38**
TMT heterogeneity index		-0.33**	-0.29**	-0.27**
Directive leadership index		0.27**	0.23**	0.20**
Empowering leadership index		-0.46**	-0.39**	-0.32**
Dynamism $\times$ heterogeneity			0.51**	0.45**
Dynamism $\times$ directive			-0.48**	-0.34*
Dynamism $\times$ empowering			0.38**	0.31**
Heterogeneity $\times$ directive			-0.27**	-0.23**
Heterogeneity $\times$ empowering			0.41**	0.38**
Heterogeneity $\times$ dynamism $\times$ directive				0.74**
Heterogeneity $\times$ dynamism $\times$ empowering				-0.58**
<i>F</i> -Change		2.07	3.04	4.70
$\Delta R^2$		0.07**	0.14**	0.20**
<i>F</i> -ratio	3.86**	5.93**	8.97**	12.84**
<i>R</i> <sup>2</sup>	0.16	0.23	0.37	0.57

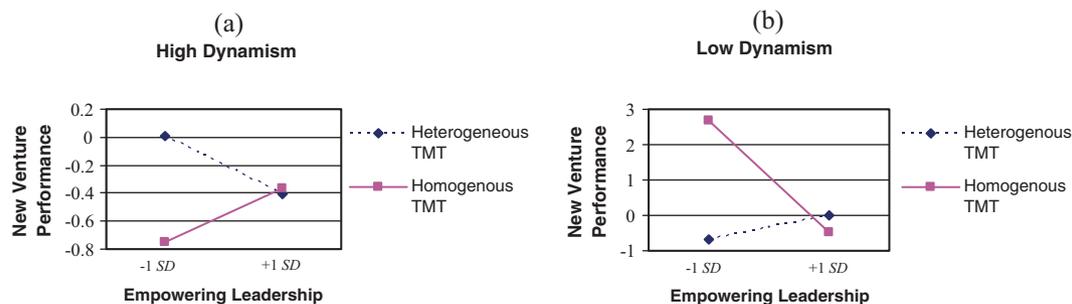
\* $p < 0.05$ ; \*\* $p < 0.01$ .

Figure 2. Interaction graph of empowering leadership behavior with top management team heterogeneity on new venture performance in the presence of high (a) and low (b) dynamism for the national random sample

hypothesis 2b stated that under low industry environmental dynamism, empowering entrepreneur leadership behavior will reduce the effects of top management team homogeneity on new venture performance, such that the relationship between top management team homogeneity and new venture performance will become increasingly negative as empowering leadership increases. Figure 2 demonstrates that, within low dynamism environments, empowering leadership of heterogeneous top management teams has a positive effect on new venture performance and that empowering leadership of homogeneous top management teams has a negative effect on new venture performance. As shown in Table 5, the simple slope for empowering leadership of heterogeneous teams within low dynamism

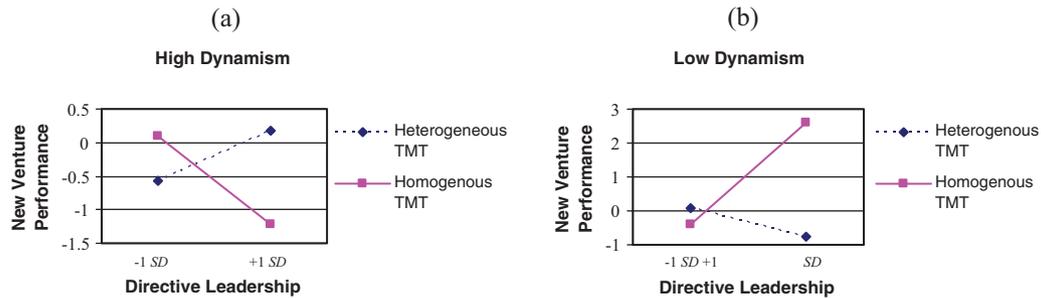


Figure 3. Interaction graph of directive leadership behavior with top management team heterogeneity on new venture performance in the presence of high (a) and low (b) dynamism for the national random sample

Table 5. Simple slopes of interactions of empowering and directive leadership at high and low levels of top management team heterogeneity and environmental dynamism

Variable	High dynamism				Low dynamism			
	High TMT heterogeneity		Low TMT heterogeneity		High TMT heterogeneity		Low TMT heterogeneity	
	$\beta$	<i>t</i> -value	$\beta$	<i>t</i> -value	$\beta$	<i>t</i> -value	$\beta$	<i>t</i> -value
<b>Inc. 500 sample</b>								
Empowering leadership	-0.19	2.24*	0.33	3.89**	0.43	5.22**	-1.95	-23.69**
Directive leadership	0.56	6.26**	-0.64	-7.00**	-0.64	-6.03**	1.40	14.11**
<b>National random sample</b>								
Empowering leadership	-0.21	-2.20*	0.19	1.99*	0.33	3.44**	-1.59	-14.79**
Directive leadership	0.37	3.36**	-0.65	6.23**	-0.43	-4.48**	1.51	14.05**

Note: Beta coefficients for high and low values are calculated at +1 SD and -1 SD of the given variable.

environments is positive and significant for both the *Inc.* 500 sample ( $\beta = 0.43, p < 0.01$ ) and the national random sample ( $\beta = 0.33, p < 0.01$ ). In contrast, the simple slope for empowering leadership of homogenous teams within low dynamism environments is negative and significant for both the *Inc.* 500 ( $\beta = -1.95, p < 0.01$ ) and national random sample ( $\beta = -1.59, p < 0.01$ ). Therefore, the findings provide support for hypotheses 2a and 2b.

Hypothesis 3a stated that under high industry environmental dynamism, directive entrepreneur leadership behavior will enhance the effects of top management team heterogeneity on new venture performance, such that the relationship between top management team heterogeneity and new venture performance will become increasingly positive as directive leadership increases. Conversely, hypothesis 3b stated that under high industry environmental dynamism, directive entrepreneur leadership behavior will reduce the effects of top management team homogeneity on new venture performance, such that the relationship between top management team homogeneity and new venture performance will become increasingly negative as directive leadership increases. Figure 3 demonstrates that, within high dynamism environments, directive leadership of heterogeneous top management teams has a positive effect on new venture performance and directive leadership of homogeneous top management teams has a negative effect on new venture performance. As shown in

Table 5, the simple slope for directive leadership of heterogeneous teams within high dynamism environments is positive and significant for both the *Inc.* 500 sample ( $\beta = 0.56, p < 0.01$ ) and the national random sample ( $\beta = 0.37, p < 0.01$ ). In contrast, the simple slope for directive leadership of homogenous teams within high dynamism environments is negative and significant for both the *Inc.* 500 sample ( $\beta = -0.64, p < 0.01$ ) and the national random sample ( $\beta = -0.65, p < 0.01$ ). Therefore, the results support hypotheses 3a and 3b.

Hypothesis 4a stated that under low industry environmental dynamism, directive leadership behavior will reduce the effects of top management team heterogeneity on new venture performance, such that the relationship between top management team heterogeneity and new venture performance will become increasingly negative as directive leadership increases. Conversely, hypothesis 4b stated that under low industry environmental dynamism, directive leadership behavior will enhance the effects of top management team homogeneity on new venture performance, such that the relationship between top management team homogeneity and new venture performance will become increasingly positive as directive leadership increases. Figure 3 demonstrates that, within low dynamism environments, directive leadership of heterogeneous top management teams has a negative effect on new venture performance and that directive leadership of homogeneous top management teams has a positive effect on new venture performance. As shown in Table 5, the simple slope for directive leadership of heterogeneous teams within low dynamism environments is negative and significant for both the *Inc.* 500 sample ( $\beta = -0.64, p < 0.01$ ) and for the national random sample ( $\beta = -0.43, p < 0.01$ ). In contrast, the simple slope for directive leadership of homogenous teams within low dynamism environments is positive and significant for both the *Inc.* 500 ( $\beta = 1.40, p < 0.01$ ) and national random sample ( $\beta = 1.51, p < 0.01$ ). Therefore, the findings provide support for hypotheses 4a and 4b.

Overall, strong support is found for adopting a contextual approach toward examining entrepreneur leadership behavior, as the full moderator model accounted for 63 percent and 57 percent of the variance in the overall growth index for the *Inc.* 500 sample and national random sample, respectively.

## Discussion

The purpose of this study was to examine how the interaction between entrepreneur leadership behavior, new venture top management team heterogeneity, and industry environmental dynamism relates to the performance of startups. In doing so, our goals were to advance the entrepreneurship literature on new venture performance, and also extend the leadership literature—which has recently reasserted its focus onto contextual concerns (Griffin & Mathieu, 1997; Osborn, Hunt, & Jauch, 2002).

In dynamic environments, startups with heterogeneous top management teams were found to perform best when led by individuals high in directive leadership behavior and low in empowering leadership behavior. In distinct contrast, homogenous top management teams were found to perform best when led by individuals low in directive leadership behavior and high in empowering leadership behavior. It seems that directive leadership might help to focus the attention of heterogeneous teams in dynamic environments, where conditions are stressful and decisions need to be made quickly. In contrast, heterogeneous teams that are led by empowering leaders are likely to become hung-up in rational decision-making processes that limit their ability to act quickly, therefore missing out on opportunities having limited windows of time to exploit. In support of this interpretation, it has been shown that the failure of such teams to quickly reach consensus can create a downward spiral of conflict amongst team members (Knight et al., 1999). Although diverse perspectives are often viewed as necessary for making sense of uncertain environments, the abundance of opportunities that exist for

startups to exploit in dynamics industries may offset the need for extensive rational decision-making. Instead, research suggests that it is more important for startups to move ahead quickly before missing critical windows of opportunity (Baker, Miner, & Eesley, 2003). In fact, top management team consensus has been shown to be less important in dynamic, rather than stable, environments (Homburg, Krohmer, & Workman, 1999). The combination of both directive leadership and team heterogeneity may, however, create a situation such that speed and comprehensiveness—the outcomes found by Eisenhardt (1989) to be most important to achieving high performance within dynamic environmental conditions—may be possible.

In stable environments, the inverse relationships were observed. Startups with heterogeneous top management teams were found to perform best when led by individuals high in empowering leadership behavior and low in directive leadership behavior; whereas homogenous top management teams were found to perform best when led by individuals low in empowering leadership behavior and high in directive leadership behavior. When the environment is fairly stable, it seems that empowering leaders are able to get the most from heterogeneous top management teams. Here they have the time to spend on in-depth debate and consensus building before finalizing strategic decisions. Further, the availability of quality information for rational-decision making tends to be more abundant in stable environments (Hayek, 1945), thus favoring heterogeneous top management teams who are led by empowering leaders. In contrast, leading heterogeneous top management teams in stable environments with directive leadership is likely to decrease the commitment of team members. In such conditions the leader simply does not have as good of reason for not allowing team members to voice their opinions and participate in strategic decision-making. Conversely, directive leadership appears to be quite effective for startups with homogenous top management teams. Since homogenous teams are likely to already be high in consensus and share similar views with their team leaders (Yousef, 2000), there is simply less need for involving them in the strategic decision-making of the firm when little change is taking place in the industry.

In regard to extending the leadership literature, our results provide strong support for the value in contextual models of leadership (Griffin & Mathieu, 1997; Osborn, Hunt, & Jauch, 2002). In this vein, we have demonstrated that by considering factors that are both internal and external to the firm, we reached different conclusions than we might have by separately considering only internal or external factors. For example, we found that both top management team heterogeneity and industry environmental dynamism may influence the extent to which empowering and directive leadership are positively versus negatively related to performance. Further, we would have been left with a less complete story if we had considered only the interaction of team heterogeneity or environmental dynamism with leadership behavior. As such, we have extended the research of others who have considered the individual interactions of leadership behavior with environmental dynamism (Waldman et al., 2001), top management team heterogeneity with environmental dynamism (Hambrick & Mason, 1984), and leadership behavior with top management team heterogeneity (Ferrier & Lyon, 2004)—by examining how these variables interact together in a single model. Others have suggested the importance of models that consider how leaders shape their behavior according to both team characteristics and environmental conditions (e.g., Edmondson, Roberto, & Watkins, 2003), but there has been a noticeable lack of studies that have empirically tested such relationships.

### *Limitations and future directions*

Due, in part, to the complexity of our research question, there are several limitations to our study, which also present opportunities for future research. First, and perhaps most important, the study does not directly measure the underlying processes or mechanisms through which the observed interactions

between the variables occur. This problem is common in research on top management teams, primarily because team demographic information is much less costly to collect than is data specific to actual team processes (Hambrick, 1994). It is also a characteristic shortcoming of much of the leadership literature, which fails to consider the underlying mechanisms through which leadership behavior influences group processes (Yukl, 2002). This poses an interesting research opportunity for others to drill-down further to empirically consider the processes through which leadership behavior, team composition, and environmental dynamism interact to influence performance.

In addition, our study does not allow for us to speak to the extent to which environmental dynamism, top management team heterogeneity, and leadership behavior influence or shape each other. Taking multiple measures of these variables across time would allow for the use of HLM procedures that could be employed to address this issue (Griffin, 1997). Such an approach would provide a much richer understanding into the complexity of leadership behavior.

Further, since only new ventures were considered in the current study, we are limited in the extent to which we can generalize our findings to the context of large, established organizations. Although we do not necessarily have reason to assume that similar findings would not result in other types of firms, research has shown that optimal leadership behavior tends to vary depending on the point in the evolution of the firm (Baglia & Hunt, 1988; Miller & Friesen, 1984; Quinn & Cameron, 1983; Smith & Miner, 1983; Smith, Mitchell, & Summer, 1985). Therefore, it might be interesting to examine these relationships in other kinds of firms and also longitudinally across various stages in the organizational life cycle. Following this approach might necessitate the adoption of other performance measures that are more applicable to the type of firm and stage of its development. Finally, beyond measures of firm performance, it might also be interesting to consider team and individual outcomes such as commitment (Bishop & Scott, 2000) and satisfaction (Griffin, Patterson, & West, 2001).

## Conclusions

A great deal of criticism has been leveled toward contextual models of leadership in the past (Ashour, 1973; Schriesheim and Kerr, 1977; Vecchio, 1983). The failure of previous contextual examinations of leadership has been described as being twofold. First, previous studies have often failed to adequately test and measure models of contextual or situational leadership (House & Aditya, 1997). These methodological shortcomings are at the heart of the attacks on situational leadership studies of the past (House & Aditya, 1997). We worked diligently in the current study to develop measures and methods to address this concern. Second, previous studies have oversimplified the contextual framework within which leadership takes place. For example Schriesheim and Kerr (1977) and Vecchio (1983) have criticized contextual models of leadership that have specified only a single moderator and account for only minimal levels of variation in performance. In the current study, we found a substantial portion of the variance in performance to be explained when contextual factors that are both internal and external to the firm are considered together.

Recently, compelling arguments have been made for a return toward the study of contextual models of leadership (Osborn et al., 2002). Our findings support this view and suggest that there may be great value in conducting further studies of contextual leadership models. In particular, we found factors both internal and external to the firm to be highly related to leadership effectiveness. In the present study, we examined dynamism (external factor) and team heterogeneity (internal factor). From the heterogeneity or internal environment perspective it is clear that the management of the 'upper echelons' is a complex task (Hambrick & Mason, 1984) and is made more complex by extensive variety in the backgrounds

and skills of the individual team members (Jackson et al., 1991). Future research should work to tease out which executive team composition variables most highly interact with leadership behavior to influence performance. Such work might consider variables beyond those that were investigated in the current study.

While the internal factors of team composition and the leadership of more or less diverse executive groups appears to be critical to the young, growing organizations that we studied, there are also outside contextual issues that clearly relate to the effectiveness of various types of leadership behavior. This was demonstrated, for example, by Waldman et al. (2001) who found a perceptual measure of industry environmental dynamism to moderate leadership performance. Our findings using an objective, archival measure of dynamism supports this general view. Future studies might consider other potential industry level moderators such as munificence (Aldrich, 1979) and competitiveness (Sharfman & Dean, 1991).

The ability to attune to multiple levels of analysis appears to be a highly important aspect of leadership. Clearly, continually surveying both the internal and external environment is a critical role of chief executives (House & Aditya, 1997; Osborn et al., 2002). Their ability to simultaneously balance internal and external pressures and choose the most effective leadership style demonstrates awareness at the individual, team, and external environment level. If a chief executive is lacking in understanding of either the internal or external context of his/her firm, then leadership development addressing these issues should drive substantial performance gains.

Finally, we believe that our work demonstrates the complexity of executive leadership, highlighting important linkages between individual, team, and firm level variables. These linkages are not well understood within the leadership literature and appear to be more complex than we would like to have believed in the past. In this light, we challenge others to develop and test further contextual leadership models using multiple internal and external variables. While there have been criticisms in the past of such approaches, it is clear that important relationships exist between contextual and leadership variables and that this area of inquiry should push forward.

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