



Examining the Leadership Molecule: An Empirical Study of Key Leadership Roles in Rapidly Growing Entrepreneurial Businesses

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Abstract. Previous theory and research has focused upon opportunity seeking behavior as the essence of entrepreneurial leadership, and neglected the role of advantage-seeking behavior by leaders. However opportunity seeking behaviors alone are insufficient to enable businesses reach the next stages of growth. A previous paper has suggested five specific roles that enable leaders to maximize both opportunity seeking as well as advantage seeking behaviors. These five roles are executed by a team rather than a single individual comprising what has been termed a “Leadership Molecule”. In this study, we empirically test the Leadership Molecule hypothesis by developing and validating a scale for measuring the Leadership Molecule. We use data from 213 participants from 26 rapidly growing entrepreneurial small businesses based in China*. Factor analyses results confirm the existence of a Leadership Molecule. The scale had a high internal reliability (Cronbach’s = .91) and showed good convergent, discriminant and criterion related validity.

Keywords: leadership molecule, leadership molecule scale, organizational effectiveness, growing pains, reliability, validity

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1. Introduction

What are the core tasks of entrepreneurial leadership in rapidly growing but entrepreneurially oriented businesses? Although the study of leadership is one of the most researched topics in management studies (Bass and Bass, 2008), exploring leadership in the context of rapidly growing entrepreneurial businesses is relatively sparse.

The few studies that explicitly explore leadership in entrepreneurial contexts suggest that entrepreneurial leaders perform two key tasks. The first is influencing others to manage resources strategically to emphasize opportunity-seeking (entrepreneurship). The second is advantage-seeking behaviors which include

strategic management tasks such as building competencies (Covin and Slevin, 2002; Ireland, Hitt and Sirmon, 2003). Although both opportunity seeking behaviors and advantage-seeking behaviors have been conceptualized as key leadership tasks, operationalizations of entrepreneurial leadership behaviors emphasize mainly *opportunity seeking behaviors*. For example, in the first paper validating the construct of entrepreneurial leadership, Gupta, McMillan and Surie (2004) operationalize it to include framing challenges so that others are motivated to accomplish goals, absorbing uncertainty, clearing paths by dissolving resistance, building commitment, and specifying limits to hold and sustain follower commitment.

Although *opportunity seeking behaviors* are crucial leadership responsibilities, they provide only a limited explanation of the full range of capabilities required to lead rapidly growing entrepreneurial businesses to successful outcomes. For entrepreneurial firms, a broader, more comprehensive view of what leadership really involves is required.

To illustrate the broader overview of leadership required for entrepreneurial success and in particular the role of advantage-seeking behaviors; we will examine the case of Walmart in Competition with Sears and K-Mart. When Walmart was founded as an entrepreneurial company, Sears was the dominant retailer in the US, and K-mart was the leading discount retailer. Today, Walmart is the dominant retailer not only in the US but on a global basis. One of the major reasons or “secrets” of Walmart’s success as compared to K-Mart and Sears as well as other leading retailers is derived from the founder’s (the legendary Sam Walton) focus upon and development of the firm’s “operational systems.” These include the systems and processes (such as information technology, logistics and distributions systems) necessary for a firm to operate on a day to day basis. In a business like Walmart, where there are no difference in products being sold (i.e., Johnson” baby powder, Allegan lens solution, Colgate toothpaste, etc) *vis a vis* competitors, products are effectively a “commodities.” In a commodity type business, the key to strategic success is to become the low cost producer. Accordingly Walmart’s strategy was to accomplish exactly that. This, in turn, required that Walmart’s focus on information technology for cost-effective inventory management, including monitoring inventory in stores, replenishment of fast growing products, This enabled Walmart to keep inventory costs down, and enabled it to develop sustainable competitive advantages *vis a vis* K-mart and ultimately win their retail “war” (Ireland, Hitt and Hoskisson, 2009).

Thus the differences between Walmart’s success, and K-Mart’s failure, are not as much in their leaders’ product vision or innovation, or helping others accomplish goals, or absorbing uncertainty, or clearing paths by dissolving resistance; it was derived from their development of “systems.”

This is not an isolated case. Organizational success for entrepreneurial firms depends to a considerable extent upon the development of “organizational infrastructure” (Flamholtz and Hua, 2003; Flamholtz and Randle, 2008).

In brief, in our view providing a business vision and empowering followers to seize opportunities (opportunity seeking leadership) are two necessary but not sufficient tasks performed by leaders in entrepreneurial businesses, to create successful organizations. For creating organizational success, both opportunity-seeking and advantage-seeking behaviors are necessary, but neither is sufficient alone (Amit and Zott, 2001; Hitt and Ireland, 2000; Ireland et al; 2003, McGrath and MacMillan, 2000). Accordingly, once leaders have been successful in seizing opportunities, they must establish strategic frameworks within their businesses such that those opportunities are effectively exploited. This post-opportunity exploitation phase is relatively under-researched and under-appreciated in extant literature on entrepreneurial leadership. However this stage is critical in determining whether the firm successfully attains its next stage of growth or fails, as illustrated by the success of Walmart.

1.1. Research Purpose

In this study, we build upon existing literature and then integrate observations from the field¹ to propose five specific roles that entrepreneurial leaders must perform. We hypothesize that this set of roles will enable leaders to maximize both opportunity seeking as well as advantage seeking behaviors. We also hypothesize that these five roles are performed (executed) by a core leadership team which has been termed a “Leadership Molecule” rather than by as single individual. The core components of a Leadership Molecule are: 1) Vision and Strategy Role 2) Culture Role, 3) Operations Role, 4) Systems Role and 5) Innovation and Change Role (Flamholtz and Randle, 2008; Flamholtz, 2011). These are defined below.

In the vision and strategy role, leaders set a vision and a future direction for the organization. The culture role focuses on enabling employees to embrace the organization’s core values. The operations role manages the day to day operations of the entrepreneurial business. The innovation and change role is to identify and exploit new entrepreneurial opportunities. Although the four roles of vision and strategy, culture, operations and innovation and change are intuitively clear, less obvious is the notion of developing “systems.” In actual organizations today, we can observe specific roles related to the functions of vision and strategy, and culture, operations, and innovation and change. There are CEOs who focus on vision, strategy and culture, or a Chief Culture officer (i.e., Google) focusing on culture. There are COOs focused on operations. There are research and development (innovations) roles, and even “change agents.” However, there is no “Chief Systems Officers.”

1. Observations are based on first author’s experience in consulting various firms for over 30 years.

These are five overlapping and integrated roles are typically performed by a set of leaders rather than by a single individual, and, in turn, this leadership “team” forms what is termed a “Leadership Molecule” (Flamholtz, 2011; Flamholtz and Randle, 2008).

Accordingly, we propose that in addition to providing a vision and maintaining the innovative spirit in the organization, which until now has been the main focus of prior studies in entrepreneurial leadership; entrepreneurial leaders must focus on organizational systems, operations, and firm culture. Further, we argue that performing *all five roles* in an integrated manner is a precondition to success in rapidly growing entrepreneurial firms. This supports and extends the importance of integrating the “transactional” (operations and systems) and “transformational” (vision, culture, and innovation) aspects of leadership roles (Bass, 1985, Bass and Bass, 2008; Burns, 1978) to be an effective entrepreneurial leader.

The remainder of the paper is structured as follows. In the next sections of the paper we review the literature on entrepreneurship. We outline how entrepreneurial leadership has been conceptualized earlier and discuss how theories of leadership relate to entrepreneurial leadership. We then develop the concept of a Leadership Molecule, elaborate upon its core components and the forms that a Leadership Molecule can take. We then provide empirical support for the Leadership Molecule hypothesis. We report the results of an empirical study assessing the existence of a Leadership Molecule in entrepreneurial organizations. We develop and validate the Leadership Molecule scale by using data from 213 participants from 31 rapidly growing entrepreneurial small businesses based in China. We use self-reported and subordinate reported data to assess the existence of a Leadership Molecule. Results of our factor analyses indicate the existence of a Leadership Molecule with the five hypothesized dimensions. The scale had a high internal reliability (Cronbach’s = .91) and showed good convergent, discriminant and criterion related validity. We also found a significant positive relationship between the existence of a Leadership Molecule and overall “organizational effectiveness” defined in terms of a previously developed (Flamholtz, 1995) and validated model (Flamholtz and Aksehirili, 2000; Flamholtz and Hua, 2002 A and B; Flamholtz and Kurland, 2006) and a significant inverse relationship between Leadership Molecule and a previously developed and validated measure of “Growing Pains” in rapidly growing entrepreneurial businesses (Flamholtz and Randle, 2008). In the final sections of the paper, we discuss the implications of these findings for future research and practice of entrepreneurship.

2. Literature Review

2.1. Conceptualizations of Entrepreneurial Leadership

Entrepreneurial leadership is typically conceptualized by integrating the concepts of entrepreneurship, entrepreneurial orientation, and entrepreneurial management with leadership (Gupta et al., 2004). It focuses on taking an entrepreneurial approach, such that firms can develop enhanced capabilities to create and appropriate value. In one of the seminal papers, developing and measuring the construct of entrepreneurial leadership, Gupta et al (2004) state that the first challenge for entrepreneurial leaders is to envision and create a set of opportunities which are those that can be seized to revolutionize the current transaction set, given resource constraints (Gupta et al, 2004). They conceptualize this challenge as scenario enactment. The second challenge is to convince followers and stakeholders that that the transformation of this transaction set are possible by assembling resources to accomplish the objectives. They term this as cast enactment. Accordingly, entrepreneurial leaders create visionary scenarios that are used to assemble and mobilize a supporting cast of interdependent members who commit and enact the vision to achieve strategic value creation (Gupta et al.,2004, p. 242).

Similarly McGrath and McMillian (2000) suggest that entrepreneurial leadership includes creating a climate supporting continuous search for opportunity, framing, stocking an opportunity register, focus and promoting adaptive execution. Covin and Slevin (2002) suggest that entrepreneurial leaders must accomplish several things: nourish entrepreneurial capability; protect innovations which threatening the current business model; to revisit strategic questions and issues (such as the viability of the markets in which the firm competes, the dominant logic in the industry, the company's purpose, and how success is defined, and the firm's relationships with different stakeholders) and link entrepreneurship with strategic management.

Entrepreneurial leaders are also known to create entrepreneurial cultures and organizations where employees are willing to innovate and take risks, enable firms be aggressive toward competitors and proactive to potential opportunities, and act as facilitators to encourage team creativity and empower others in problem solving (Flamholtz and Randle, 2011; Chen, 2007; Schein, 2004; Ekvall and Arvonen, 1994; Rickards and Moger, 1999, 2000; Lumpkin and Dess, 1996). Thus entrepreneurial leaders are transformational agents, emphasizing opportunity exploitation.

Although we embrace these prior conceptualizations of aspects of entrepreneurial leadership, we believe that they are an incomplete explanation of the process. Complementing these prior scholars' approach, we suggest that focusing on the transactional frameworks within the organizations such as

operations and systems and culture to accomplish opportunity exploitation is just as important as opportunity creation to the success of entrepreneurial firms. In support of this view we draw upon theories of strategic leadership.

2.2. Theories of Leadership and Entrepreneurial Leadership

Researchers in the area of leadership state there are three types of leaders—strategic leaders, visionary leaders and managerial leaders (Rowe, 2001). Strategic leaders focus on influencing others to make day to day decisions that enhance long term viability and short term financial stability of the organization. Visionary leadership is future oriented concern with risk taking. Visionary leaders are more concerned with bringing about change and innovation. Visionary leaders are proactive, work on fresh approaches to long standing problems, influence attitudes and opinions of others, and are more willing to invest in innovation. Managerial leadership involves stability and order. Managerial leaders are short term oriented, and handle day to day activities as well as preserve existing order.

Prior conceptualizations of entrepreneurial leadership are closer to the themes of visionary leadership. The focus of entrepreneurial leaders is to influence others to emphasize entrepreneurial and innovative behaviors, providing a vision for opportunity-seeking, *and* advantage-seeking behaviors and to manage resources strategically (Ireland, Hitt and Sirmon, 2003). Gupta et al. (2004) summarize this view by stating that entrepreneurial leaders must:

1. extract exceptional commitment and effort from organizational stakeholders,
2. convince them that they can accomplish goals,
3. articulate a compelling organizational vision,
4. promise their effort will lead to extraordinary outcomes, and
5. persevere in the face of environmental change.” (p. 246, Gupta et al, 2004)

However, visionary leaders are likely to “invest more in their vision than the returns warrant, and, without the constraining influence of managerial leaders, could destroy wealth.”(pp.85, Rowe, 2001). Rowe (2001) suggests that organizations might be able to combine visionary leadership with managerial leadership for overall effective leadership. However, Rowe (2001) suggests that an even better model is strategic leadership. Strategic leaders are those who dream, as well as, have strategic and financial controls in place to turn those dreams into a reality.

In contrast to prior conceptualizations, our view of a Leadership Molecule postulates that the key elements of leadership combines vision and innovation backed up by strategic and operational controls. We emphasize the importance of combining the transactional and transformational aspects of leadership for leading entrepreneurial organizations.

2.3. Developing the Concept of a Leadership Molecule

This section explains the concept of the Leadership Molecule in detail, and examines its origin. Discovery of the Leadership Molecule was serendipitous. Although the discovery of the molecule occurred as a by-product of organizational development work with several companies over many years by the first author, there was a moment of recognition of a common feature to several successful companies in managing rapid growth. Specifically, the first author observed that a common aspect of these companies was the existence of a “core leadership team” (in the true sociological sense) with defined but overlapping and complementary roles. The specific instance of recognition was at Starbucks Coffee. The core senior leadership team, as explained further below, was comprised of three leaders who worked as a team possessed complementary skills and performed overlapping but semi-distinct roles.

To elaborate, at Starbucks each individual (Howard Schultz, Howard Behar, and Orin Smith) had his own defined “formal” role. Schultz was CEO; Behar was head of Retail operations, and Smith was the CFO. The formal roles were somewhat of a misnomer and only partially reflected (and partially obscured) the actual or real roles of each of these three individuals. In fact, Howard Schultz (the CEO) was primarily (but not exclusively) responsible for the vision and culture of Starbucks. However Schultz was also involved to some extent with operations and systems at Starbucks. Howard Behar, SVP and head of Retail operations was primarily responsible for Retail Operations (which at the time of this observation accounted for approximately 95% of Starbuck’s revenues). However Behar was also involved to some extent with creating the vision and culture of Starbucks as well as its systems. Finally, Smith, who was formally CFO, was involved primarily with the development of the systems required by Starbucks, not just financial systems but information systems, planning systems, human resources systems, and other systems as well. However, he too was involved in creating the vision and culture of Starbucks and to some extent with operations as well. All three were involved with innovation and change at Starbucks. Taken together, Schultz, Behar and Smith were functioning not as a set of discrete individuals performing independent roles; they were functioning as a team performing a set of complementary but somewhat overlapping roles. They comprised what has been termed a “Leadership Molecule.”

Howard Schultz commented on this in his book “Pour your heart into it: how Starbucks built a company one cup at a time” (Schultz and Yang, 2001). “By 1990 I had assembled a management team that worked so tightly and so synergistically together that people called us H2O for Howard, Howard and Orin. We stood for the vision, the soul the fiscal responsibility.” (pp. 155, Schultz and Yang, 2001). Clearly people within Starbucks saw the three as “a unit,” and not just three individuals running a company.

Although Starbucks was the catalyst for the recognition of this construct of a Leadership Molecule, the first author also recognized that similar “molecules” existed in other enterprises. In addition, where they existed they were similarly accompanied by a moniker or “nickname” that was a marker of their existence. Some of these were: “The Three Musketeers,” “The Troika,” at Google, The “Gang of Four,” “Batman and Robin, and “The Ghost and the Darkness.”

Other researchers studying shared leadership have observed the existence of what has been termed here the Leadership Molecule, but without conceptualizing it as such a construct. For example O’Toole, Galbraith and Lawler (2002), in their study of shared leadership provide numerous examples from Boeing and other organizations. At Boeing, Condit is the visionary providing spiritual and long-range leadership while Stonecipher is responsible for watching numbers and holding people accountable (O’Toole, et al., 2002). Similarly at Motorola the then CEO Bob Galvin was the visionary and, the stabilizing force, while others such as John Mitchell, George Fischer, and William Weisz ran operations. At Oracle Larry Ellison was the visionary entrepreneur who felt the need to bring in the analytical and managerial Ray Lane (O’Toole, et al, 2002). Typically, while one leader provides the vision and the impetus for innovation and change, others manage the operations, systems and financials.

2.4. Development of a Leadership Molecule at different Business Growth Stages

During the early stages of growth of an entrepreneurial firm, a single strong leader tends to perform all five functions by himself (or herself). At this stage, the leader is a one woman (or one man) band performing all of the required strategic leadership functions. This happens whether or not a single individual possesses all of the competencies to execute each of these leadership functions.

As the organization grows, there is a need for managerial specialization and the development of a set of people to perform these functions rather than a single individual. Even when a single person possesses all of the capabilities to perform all of these leadership tasks, as an organization increases in size it becomes more and more difficult to perform all functions.

At this stage a set of individuals who perform these tasks tends to emerge. The functions are divided such that one person typically focuses on vision and culture, another on operations, and the third the development of systems.

2.5. Core components of a Leadership Molecule

The core components of a Leadership Molecule are Vision and Strategy Role, Culture Role, Operations Role, Systems Role, and Innovation and Change Role (Flamholtz and Randle, 2008). Figure 1 illustrates the core Leadership Molecule.

Vision and Strategy Role

The first role is that of “Vision and Strategy.” The purpose of this role is to provide a vision for the organization, and set a direction for the future of the organization. This is similar to the “charisma” role (Bass, 1990) of “transformational leadership” where leaders provide vision, create a sense of mission, instill pride and gain respect and trust.

Culture Role

The function of the culture role is to cause employees to embrace the core values of the enterprise (Flamholtz and Randle, 2011). For example, the culture might emphasize employees seizing entrepreneurial opportunities. This role is similar to the one suggested by Gupta *et. al.* (2004) in which leaders revolutionize the current transaction set within the resource constraints.

In many organizations, the vision and strategy, and culture roles typically go hand in hand. For example, Howard Schultz, founder and CEO, is responsible for the vision and culture at Starbucks.

Operations Role

The third role in a Leadership Molecule is “Operations.” This can be the role of a COO or another executive charge with day to day operations. For example, Howard Behar who was responsible for the Retail stores at Starbucks was the member of the leadership team responsible for operations, even though he was never COO.

Systems Role

The fourth role in a Leadership Molecule is “Systems.” This role might never even appear on an organizational chart, because (as noted above, there are currently no “Chief Systems Officers” at least to our knowledge); but it exists in the informal organizational structure and in the Leadership Molecule. The purpose of this role is the oversight of the development of systems. Orin Smith, who was originally the CFO and later the COO and finally the CEO, at Starbucks performed the “Systems role.”

Innovation and Change

The focus of this role is to encourage innovation and change within the organization. Sustaining innovation and changing the organization to meet the challenges of new entrepreneurial opportunities forms the focus of this role. This is similar to the leading change role envisioned by previous researchers (Covin and Slevin, 2002; Gilley, Dixon and Gilley, 2008, Gupta et al, 2004). All three leaders- Howard Schultz, Howard Behar and Orin Smith, were all individually and jointly instrumental in fostering innovation and change at Starbucks.

The roles of vision and culture, and innovation and change, performed by leaders is similar to the visionary leadership style and reflects entrepreneurial leadership roles discussed by previous researchers (Bass, 1985, Bass and Bass 2008, Ireland et al, 2003; Gupta et al, 2004). However our conceptualizations of entrepreneurial leadership extend the concept by including the two other roles of operations and systems.

2.6. Forms of the Leadership Molecule

In practice, the Leadership Molecule can take several different “forms” or combinations of roles. In larger firms, most often, there is a core team of three people performing the five key leadership functions identified above. In this form, the first four leadership functions exist as an integrated unit performed by three people. The fifth function innovation and change is performed by the team as a whole and is not typically the primary focus of a single individual.

The three person Leadership Molecule seems to be the “classic form” or structure (Flamholtz and Randle, 2008) of the molecule, in the sense we have observed that most frequently. An example of this was “the Troika” at Google. This is the so-called “Troika” at Google, which (until recently) consisted of founders Sergey Brin, and Larry Page, and Eric Schmidt, who was hired to be CEO. However sometimes there is a molecule consisting of two people, and other time of four or even five people. As described above, another example of this form was found at Starbucks Coffee.

3. Empirical Support for the Model

This section describes the research to test the Leadership Molecule concept and related hypotheses. Data for this study were collected as part of an executive coaching program conducted for senior leaders companies in China. The research methodology and results are described below.

3.1. Participants

The participants (research subject) included senior leaders and employees of organizations whose senior leaders were enrolled in the “CEO Leadership Program” conducted by the Cheung Kong Graduate School of Business (“CKGSB”), Beijing and Shanghai China. The intent of the program was to enhance the leadership skills of the participants.

These senior leaders that were being rated were all CEOs or Chairmen (women) of their companies. We had a total of 26 organizations participating in this study. The survey was sent to employees of these organizations in advance before the training program. The participants’ self-rated their leadership skills and their perceptions of their organizations effectiveness. They were also rated by typically four to six of direct reports on their leadership skills and organizational effectiveness. A total of 213 individuals responded to this study. Of these, 26 were self-reports and the rest were reports by employees working with the organization.

The leaders in this study ranged in age from 42 to 48. There were approximately 85 % men and 15% women participating in the program. All were responsible for companies that were rapidly growing (more than 50% in revenue growth per year). All companies ranged in size from 600 million RMB (approximately \$100 million US) to 35 million RMB (approximately \$ 6 billion US). Participating industries included consumer products, financial services, and real estate development. The survey was administered as a part of the training program and the response rate to our study was 100%.

3.2. Measures

A survey was created to assess the various dimensions of the Leadership Molecule construct, because to the best of our knowledge no other measure is available for this construct. The survey was translated into Chinese for administration purposes and then retranslated into English by a native Chinese Mandarin speaker who had completed graduate education in the US.

Participants rated each role and organizational effectiveness on a 5 point “Likert type” scale ranging from “completely disagree” to “completely agree”. The Leadership Molecule scale is provided in Appendix A.

Vision and Strategy Role. Vision and Strategy were assessed by a 2 item sub-scale. A sample item from the scale is: “I am the person most involved and most responsible in my company for developing our company’s vision and strategy² for the self-assessment version.” For the version about others, the wording was:

2. “I” is used for self-report; the term “my leader” is used when assessing the leader by others.

“My leader is the person most involved and most responsible in my company for developing our company’s vision and strategy.”

Culture Role. The culture role was assessed by a three item sub-scale. A sample item from the scale includes “I spend time communicating the core values and culture to people throughout my company.”

Operations Role. The operations role was assessed by a four item sub-scale. A sample item from the scale includes “Managing day-to-day operations is one of my “core competencies” as a leader.”

Systems Role. The systems role was assessed by a four item sub-scale. A sample item from the scale is: “I focus a significant amount of my time leading people in developing, implementing and/or improving information systems.”

Innovation and Change Role. The innovation and change role was assessed by a three item sub-scale. A sample item from the scale includes “I have created processes that support innovation within my company.”

Additionally, participants were administered the Growing Pains scale and Organizational Effectiveness scale (Flamholtz and Aksehirli, 2000; Flamholtz and Hua, 2002; Flamholtz and Hua, 2003; Flamholtz and Randle, 2008) which have been validated by previous research as predictors of organizational growth and financial performance (Gross Margin, Earnings before interest and taxes (EBIT), and return on investment(ROI)). The growing pains scale assesses the organizational development disequilibrium which results when an organization’s infrastructure does not match its size or stage of growth (Flamholtz and Randle, 2008; Flamholtz and Kurland, 2005; Flamholtz and Hua, 2003). The organizational effectiveness scale assesses the organization’s effectiveness in the areas of markets, products, resources, operational systems, management systems, culture and financial resource management. The Cronbach’s alpha reliability of the Growing Pains Scale was found to be .85. The Cronbach’s alpha reliability of the Organizational Effectiveness Survey was .96.

The Leadership Molecule scale is expected to correlate negatively with the Growing Pains scale, because the latter is a measure of organizational distress caused by a growth disequilibrium (Flamholtz and Randle, 2008). Leaders who are effective in the five roles will help their organization reach the next stages of growth with minimal or, theoretically, no growing pains or growth disequilibrium and vice-versa. The Leadership Molecule scale is expected to correlate positively with the Organizational Effectiveness measure, which measures the degree of strategic development of an organization.

4. Results

Results of these tests are reported below.

4.1. Reliability of the Leadership Molecule

We tested the Leadership Molecule model through confirmatory factor analysis using AMOS. We tested a series of models. The first was a one-factor model where we loaded all variables onto a single factor. We tested a two factor-model where all factors were loaded on two dimensions. The first factor consisted of variables that assessed culture and innovation and the second factor was operations and systems. In the three-factor model we loaded vision and culture variables on one factor, innovation variables on the second factor, and operations and systems on the third factor. In the four factor model we loaded variables into four factors of vision and culture, innovation, operations, and systems. Finally in the five factor model we loaded the variables into the five hypothesized dimensions of vision, culture, innovation, operations and systems. Results of the confirmatory factor analysis indicated that our hypothesized five factor model provided the best fit to data. Table 1 presents the results of the analysis of the different models.

We report comparative fit indices and not absolute fit indices for this study because absolute fit indices such as Chi Square and GFI are almost always significant for sample sizes above 200. Given that we have 213 participants we use CFI (Bentler, 2004; Hoyle, 1995, Hu and Bentler, 1999, Marsh, Balla and McDonald, 1998; Tanaka, 1993), RMSEA and SRMR.

As shown in Table 1, the poorest model fit was provided by the one factor model. The CFI for the one factor model ($\chi^2=922.96$, 89) was .59. Model fit improved progressively and the best fit was provided by the five factor model. The five factor model ($\chi^2=127.08$, 79) had a CFI of .98 with an SRMR of .04 and an RMSEA of .05. This provided adequate model fit for our hypothesized model (Bentler, 2004).

4.2. Validity of the Entrepreneurship Molecule Hypothesis

Three types of internal scale validities were assessed. Cronbach's alpha, convergent validity, and discriminant validity. Cronbach's alpha assesses if the items of a given scale are internally consistent (Nunnally, 1978). Cronbach's alpha for the Leadership Molecule Scale as a whole was .91 suggesting high reliability. Convergent validity is established if the factor loadings for the scale are statistically significant (Gupta, Macmillan and Surie, 2004).

In Figure 2 we show the factor loadings for the different scales. All loadings were statistically significant thereby satisfying this criterion. In addition we used a multi-trait multi method (Campbell and Fiske, 1959) type matrix to establish convergent and discriminant validity. According to Campbell and Fiske (1959) the correlation between measures of the same trait should be higher with each other than measures of correlation with different traits. All items from the Leadership Molecule sub-scales met this requirement. The results of this analysis are shown in Table 2. As shown in Table 2, the correlations between the items of the same sub-scale were higher than the correlations between the items of a sub-scale and other scales.

In addition, we assessed the criterion related validity of the Leadership Molecule Scale by using the Growing Pains scale and the Organizational Effectiveness survey scale which has been validated by previous research (Flamholtz, 2001, Flamholtz and Aksehirli, 2000; Flamholtz and Hua, 2002; Flamholtz and Hua, 2003). Two measures have a high concurrent validity if they have a correlation coefficient of .50 or higher and a moderate concurrent validity if the correlation is between .30 and .50 (Shepherd and Wiklund, 2009). The correlations between the Leadership Molecule scale and Growing pains was negative as expected and was $-.42, p < 0.01$ indicating moderate concurrent validity. The correlations between the Leadership Molecule scale and organizational effectiveness scale was $.60, p < .01$ indicating high concurrent validity.

5. Discussion

In this study, we develop and test the concept of a Leadership Molecule. Using multi-source data from 26 rapidly growing small to medium sized entrepreneurial businesses in China, we empirically demonstrate that the Leadership Molecule has good convergent divergent and concurrent validity.

We complement existing research in the area of entrepreneurial leadership by shedding light on the less studied entrepreneurial leadership tasks. We build upon extant leadership approaches by operationalizing the dual leadership roles of both opportunity seeking and advantage seeking behaviors. Thus we explore how entrepreneurial leaders can enable their firms to capitalize upon opportunities, as well as, lead their firms successfully to the next stages of growth, by building the required frameworks within their organizations. We accentuate the importance of combining both these tasks, i.e. capitalizing opportunities and building the requisite infrastructure to capitalize them.

Practical experiences of organizations suggest that operations and systems are critical to an entrepreneurial firm's success and growth. These two dimensions help firms in managing uncontrolled growth-- a unanimous factor that entrepreneurship experts agree upon as being a primary reason for failure of

entrepreneurial firms. However, extant studies on entrepreneurial leadership do not explicitly address managing growth as a key leadership task. In this paper we emphasize the importance of synergistically combining the roles of providing vision, culture and fostering innovation with the operational and systems roles by the leadership of the organization. It is synergistic combination of these roles that forms the Leadership Molecule.

5.1. Implications

The Leadership Molecule has significant implications for researchers, executives, boards, and venture capitalists. Researchers in mainstream leadership literature have studied leadership functions from the perspective of managing large established organizations. Their main emphasis is on managerial leadership and on the systems side of leading organizations. For example Yukl (2010) states that the main functions of leadership are: helping others interpret meaning of event, align objectives with strategies, build commitment towards task, optimism, trust and cooperation, strengthen collective identity, organize and coordinate activities, encourage learning, obtain resources, empower people and promote social justice and morality. Thus the focus is on how to enable followers to *attain the organization's strategic goals*.

In contrast, the focus of leadership studies in an entrepreneurial setting is on opportunity exploitation, innovation and change (Ireland et al, 2003; Gupta et al., 2004). This is an entirely different set of problems.

Thus there is a significant gap in literature in understanding the required leadership roles for organizations which are a small entrepreneurial business attempting to when transition to large established enterprises. We have taken some initial steps towards filling this gap by identifying the roles that leaders *must* perform to make a successful transition.

This research also extends previous research that developed and examined the empirical validity of a model of organizational effectiveness (Flamholtz, 1995; Flamholtz and Aksehirili, 2000; Flamholtz and Hua, 2002 A and B; Flamholtz and Kurland, 2006). It shows that the existence of a Leadership Molecule has a statistically significant relationship to the level of organizational development in an enterprise.

Finally, the present research also links to previous research on the relationship between organizational development and growing pains (Flamholtz and Hua, 2002 B). It shows that there is a significant inverse relationship between the existence of a Leadership Molecule and growing pains. Specifically, if the molecule exists, growing pains are less than if it does not exist.

Implications for Research. This study opens the way to new research questions. Future researchers should continue to investigate the competencies required for

leaders in growing entrepreneurial small businesses. How do Leadership Molecules emerge in actual enterprises? How prevalent are they? In addition, how (through what methods) can and should a Leadership Molecule be created? Do leaders effectively assemble teams where they can synergistically function to make the transition? Are different forms of the molecule and in turn different competencies required for different stages of growth? In practice, we have observed that the most frequent form of the molecule is a three person “troika.” However sometimes there is a molecule consisting of two people, and other time of four or even five people. This leads to the question: what is the relation between organizational size and the form of the molecule required? To what extent are Leadership Molecules preconditions or determinants of organizational success? These are just a few of the numerous questions that future researchers can start exploring in this context.

Implications for Practice. From a practical perspective, it is important for executives who comprise a company’s senior leadership to truly comprise what we have termed a Leadership Molecule. They must begin to think of themselves as a Leadership Molecule. The first step is to think in terms of this construct, and not merely refer to any ad hoc group of executives as a “senior leadership team.” It takes time and effort to create a Leadership Molecule. It does not just happen by chance.

Accordingly, it is important that leaders planning management succession, boards of directors, private equity investors, and others recognize the existence of this construct. They must ensure that the five key leadership roles are performed by their leadership team, and this in turn requires thinking in terms of this construct.

It is suboptimal to replace the individual comprising a Leadership Molecule; the molecule itself must be recreated. This problem is illustrated by the difficulties encountered by Starbucks after their molecule disintegrated. When Howard Schultz sought to replace himself and the core Leadership Molecule at Starbucks, it is doubtful that he thought in terms of a Leadership Molecule per se. He hired Jim Donald, an experienced retail executive from Wal-Mart, who was ultimately fired. The problem was as much Schultz’ failure to recognize the need for a Leadership Molecule as it was a lack of competence by Donald. Thus is not a matter of putting a set of ad hoc individuals together to create the molecule; they need to be able to be effectively combined— that is, work together – in a manner that supports organizational development. This typically will require some team building, either time for the molecule to gestate naturally or to before its development to be accelerated by coaching and special team building activities. But the precondition to launching these exercises is the ability to think in terms of these complementary, overlapping roles or in terms of the Leadership Molecule construct. Unfortunately, most researchers and leaders do not think in these terms in the context of rapidly growing entrepreneurial businesses.

Another implication for individual entrepreneurs is that it is not adequate for them to be visionaries nurturing innovation to enable their firms to seize the opportunities. What is required by them is to develop their competencies along these role dimensions. It might be difficult for a single entrepreneur to be good at all roles. But as firms grow they will be able to add on partners who will complement on their weak areas. Thus the construct of a Leadership Molecule provides a systematic way to think about entrepreneurial leadership.

5.2. Study Limitations

In this study we considered only two criterion variables both of which were self-reported. Due to confidentiality reasons and restrictions imposed by participants, we are unable to publish financial data on these organizations. Although we have used two variables that have been shown by previous research to be relating to an organization's financial performance (Flamholtz and Aksehirli, 2000; Flamholtz and Hua, 2002; Flamholtz and Hua, 2003; Flamholtz and Randle, 2008), our results would be stronger if we were able to publish actual financial data. Future researchers should assess the relationship between the success with which leaders perform the five molecule roles effectively, and organizational outcomes such as organizational performance and growth.

Common method variance might be an issue for our data especially for the assessment of criterion validity. Data on both independent and dependent variables were collected at the same point in time. We used the Harmon single-factor test in testing the common method variance (Podsakoff, MacKenzie, Lee and Podsakoff, 2003). Results of the analysis revealed several factors but no single factor or general factor emerged to account for all the variance (Podsakoff and Organ, 1986) thereby slightly allaying our concerns of common method variance.

Finally, our data was collected from organizations in China. This might limit the generalizability of our findings. Future studies should investigate if the Leadership Molecule roles observed with this sample is generalizable across national contexts.

5.3. Conclusion

Previous theory and research has focused upon opportunity seeking behavior as the essence of entrepreneurial leadership, and neglected the role of advantage-seeking (competitive) behavior by entrepreneurs. Until now this has been the main focus of prior empirical studies in entrepreneurial leadership. Previous theory and research has also tended to focus upon the single entrepreneur as the source of entrepreneurial leadership.

This paper offers a broader alternative view of effective senior leadership in entrepreneurial companies. In brief, the effective senior leadership of organizations depends more upon the skills and capabilities of an individual or true executive team performing a set of leadership roles. These leadership roles are overlapping, integrated functions that must be performed in a synergetic manner.

Our results extend previous research on organizational effectiveness and suggest a positive relationship between the existence of a Leadership Molecule and overall “organizational effectiveness” (Flamholtz, 1995), that has been shown to be linked to “bottom line” financial performance (Flamholtz and Aksehireli, 2000; Flamholtz and Hua, 2002 A; Flamholtz and Hua, 2002 B; Flamholtz and Kurland, 2006). There is also significant inverse relationship between Leadership Molecule and Growing Pains. Finally, strategic Leadership Molecule includes culture formulation and management, the results have implications for effective culture management (Flamholtz, 2001; Flamholtz and Kannan-Narasimhan, 2005). The paper also examines other implications for researchers, leaders of small businesses, executive boards and venture capitalists.

In this study we have tried to reframe how individuals think of entrepreneurial leadership in *relatively* small but rapidly growing businesses. It is our hope that this will stimulate future research endeavors in this domain to build a more comprehensive theory of entrepreneurial leadership.

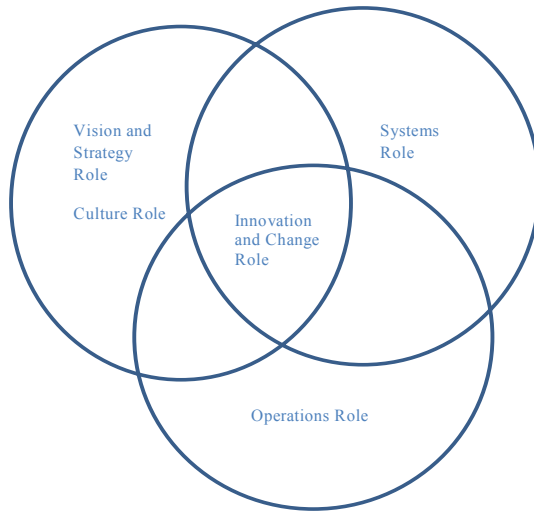
Table 1: Fit of the Research Models

<i>Models</i>	χ^2	df	P=	CFI	NFI	SRMR	RMSEA
<i>Model 1</i>	922.96	89	.00	.59	.57	.13	.22
All variables loaded on a single factor							
	653	88	.00	.72	.69	.11	.18
<i>Model 2</i>							
Loading variables on two factors- Factor 1 –Vision, Culture and Innovation Factor 2- Operations and Systems							
	469.38	86	.00	.81	.78	.09	.15
<i>Model 3</i>							
Loading variables on three factors Factor 1- Vision and Culture Factor 2- Innovation Factor 3- Operations and Systems							
	307.12	83	.00	.89	.86	.12	.07
<i>Model 4</i>							
Loading variables on four factors Factor 1- Vision and Culture Factor 2- Innovation Factor 3- Operations Factor 4- Systems							
	127.08	79	.00	.98	.94	.05	.04
<i>Model 5</i>							
Loading variables on three factors Factor 1- Vision Factor 2 - Culture Factor 3- Innovation Factor 4- Operations Factor 5- Systems							

Table 2: Correlation Matrix showing MTMM type discriminant validity for the Leadership Molecule Scale .

	VS1	VS2	Cul1	Cul2	Cul3	Ops1	Ops2	Ops3	Ops4	Sys1	Sys2	Sys3	Inno1	Inno2	Inno3
VS1	1														
VS2	.82**	1													
Cul1	.38**	.36**	1												
Cul2	.41**	.35**	.73**	1											
Cul3	.32**	.34**	.71**	.62**	1										
Ops1	.38**	.31**	.36**	.37**	.29**	1									
Ops2	.26**	.25**	.32**	.40**	.34**	.78**	1								
Ops3	.21**	.20**	.28**	.28**	.27**	.65**	.73**	1							
Ops4	.22**	.21**	.21**	.18**	.15*	.64**	.67**	.72**	1						
Sys1	.24**	.27**	.25**	.25**	.31**	.37**	.51**	.42**	.32**	1					
Sys2	.29**	.30**	.27**	.35**	.31**	.37**	.49**	.42**	.30**	.64**	1				
Sys3	.31**	.29**	.39**	.36**	.34**	.44**	.56**	.46**	.36**	.61**	.75**	1			
Inno1	.33**	.35**	.48**	.48**	.44**	.41**	.40**	.36**	.22**	.33**	.34**	.37**	1		
Inno2	.33**	.35**	.48**	.52**	.43**	.43**	.44**	.35**	.27**	.40**	.37**	.42**	.84**	1	
Inno3	.32**	.30**	.48**	.49**	.44**	.45**	.40**	.40**	.32**	.38**	.39**	.38**	.71**	.74**	1

Figure 1: Adapted from Flamholtz, 2011; Flamholtz and Randle, 2008



Adapted from Flamholtz, 2011; Flamholtz and Randle, 2008

Appendix A

I *am the person most involved and most responsible in my company for developing our company’s vision and strategy.
I am the primary driver of my company’s strategy and strategic planning process.
I spend time communicating the core values and culture to people throughout my company.
The development and management of core values and corporate culture is my greatest strength as a leader.
I have effectively communicated our company’s core values throughout the company so that everyone understands what they are.
Managing day-to-day operations is one of my “core competencies” as a leader.
Managing day-to-day operations is one of my greatest strengths as a leader.
I devote a significant amount of my time to overseeing and managing day-to-day operations.
I make most decisions about the overall company’s day-to-day operations.
I focus a significant amount of my time leading people in developing, implementing and/or improving sales and marketing systems.
I focus a significant amount of my time leading people in developing, implementing and/or improving product development systems.
I focus a significant amount of my time leading people in developing, implementing and/or improving information systems.
I recognize that change is difficult and protect those people who are serving as “change agents” in my company.
I make sure that my company understands and focuses upon the need for change.
I focus on helping people understand that true change requires time, resources, and patience.

Notes. “I” is used for self-report, the term “my leader” is used when assessing the leader by other

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