THE IMPACT OF ENVIRONMENTAL HOSTILITY ON FIRM PERFORMANCE: A STRATEGIC ORIENTATION OF MANUFACTURING INDUSTRIES PERSPECTIVE

Andrew Kach, Department of Management, Technology, and Economics, Swiss Federal Institute of Technology Zurich, 8092 Zurich, Switzerland. akach@ethz.ch

Arash Azadegan, Department of Supply Chain Management, Rutgers University, Newark, New Jersey, 07102, USA. aazadegan@business.rutgers.edu

Jeffrey Teich, Department of Management, New Mexico State University, Las Cruces, New Mexico, 88003, USA. jteich@nmsu.edu

ABSTRACT

The aim of this dissertation intends to fill a gap in the literature by seeking to understand the determinants of environmental hostility and the impact they have on business-level strategic orientations within the manufacturing industry through two different firm performance outcomes. Research has provided evidence that different forms of environmental hostility exist, yet little has been done to discriminate between the different determinants and how firm financial and innovation performance may be impacted depending on the type of hostility encountered. Borrowing and applying classical Contingency Theory from strategy, a set of hypotheses were developed relating the specific hostility attributes of competition, restrictiveness, demographic trends, and resource scarcity pressures on business-level strategy and the outcomes on firm performance. The resulting conceptual framework intends to provide insight into how researchers and practitioners alike can understand how the strategic orientations of manufacturing organizations are aligned when encountering different types of environmental hostility, filling a critical void in the literature stream.

Keywords: Environmental Hostility, Strategic Orientation, Financial Performance, Innovation Performance, Contingency Theory

INTRODUCTION

Environmental dimensions are widely believed to be an important consideration when evaluating the influences of strategic orientation on small firm performance (Fuentes-Fuentes, Albacete-Saez, & Llorens-Montes, 2004; Zott & Amit, 2007). More specifically, research has shown that organizational strategic orientations (Covin & Slevin, 1989; Lofsten & Lindelof, 2005) and strategic decision making processes (Hall, 1980; Goll & Rasheed, 1997; Mitchell, Shepherd, & Sharfman, 2011) are susceptible to environmental influences. Understanding the negative ramifications of environmental conditions motivates organizations to become increasingly adaptive, modifying strategies when encountered with unexpected change (Castrogiovanni, 1991; Bettis & Hitt, 1995). Through these approaches, smaller firms may enjoy increased overall growth and performance when aligning strategic orientations appropriately with environmental
Environmental hostility is a major influencing factor on organizational design and firm performance outcomes (Khandwalla, 1973). Hostile environments have been previously defined as “an environmental dimension which poses a threat to firm viability and performance”, characterized by intense levels of competition, precarious industry settings, harsh business climates, and a lack of external opportunities (Covin & Slevin, 1989). When encountering hostile environments, managers generally are faced with shorter decision windows, fragmented markets, increased product risks, and a lack of long term control (Nicholls-Nixon, Cooper, & Woo, 2000). While current literature has provided insights regarding the influences of environmental hostility on strategy and performance (Covin & Slevin, 1989; Katila & Shane, 2005; Lofsten & Lindelof, 2005), the only recurrent theme is that level of environmental hostility impacting organizations is steadily increasing (Morris & Paul, 1987; Mitchell et al., 2011).

Many definitions of environmental hostility are convergent, regarding hostility as a threat towards firm performance and viability; however, identifying factors that comprise environmental hostility have been fragmented throughout the literature. While the most common elements appear to be competition (Hall, 1980; Miller & Friesen, 1983; Covin & Slevin, 1989; Gonzalez-Benito, da Rocha, & Queiruga, 2010; Mitchell et al., 2011) and resource scarcity (Miller & Friesen, 1983; Calantone, Schmidt, & DiBenedetto, 1997; Goll & Rasheed, 1997; Baum & Wally, 2003), other factors have also been taken into consideration. Negative demographic trends, governmental and regulatory restrictions, international influences, and economic conditions have been observed in both early and more recent environmental hostility literature (Miller & Friesen, 1983; Wolff & Pett, 2006).

Studies that have incorporated hostility as part of their environmental framework have rarely distinguished between specific categories and how they may potentially impact firm decision making processes differently, with the exception of Katila and Shane (2005) who focused on resource scarcity and innovation performance. Additionally, analytical approaches towards hostility have been holistic, combining all definitional items into a single factor. However, operationalization of environmental hostility that takes a holistic approach may not be appropriate (Castrogiovanni, 1991; Lee, 2002); moreover, there may exist operational categories within the environmental hostility dimension that impact strategic functions and firm performance differently. For example, the types of hostility encountered by cigarette companies may be different from those impacting recycling firms or even homebuilding organizations. Therefore, differentiating between the environmental issues surrounding hostility is important by allowing for greater understanding of how to appropriately align internal firm processes and strategies depending on the type of contingencies encountered.

Environmental hostility has been considered a major influencing factor on pressures encountered by organizations within their business-level strategy (Rueda-Manzanares, Aragon-Correa, & Sharma, 2008), which explores how an organization responds to their competitors given specific price and market conditions (Hatten, Schendel, & Cooper, 1978). Successful business-level strategies must be appropriately aligned with their cosigning external environments, where effective competitive responses are dependent on the ability to monitor and react towards external contingencies by aligning business-level strategic orientations accordingly (Miller, 1988). Effective business-level strategic orientations will provide a firm with competitive
advantages in the market (Mintzberg, 1973; Miles & Snow, 1978); however, this can only be adequately obtained if the strategic orientation fits properly with the external environment (Thompson & Strickland, 2003). Looking at a more systematic depiction of environmental hostility may provide insight into how business level strategic orientations are influenced, and in turn, how firm performance outcomes are impacted. More specifically this study inquires: What do the different determinants of environmental hostility look like and how do they influence business-level strategic orientation and firm performance?

The research conducted in this study will provide insight and expand the understanding of how organizations align strategic orientations when faced with environmental hostility factors for two reasons. First, this study contributes to the existing literature stream by expanding upon the current understanding of environmental hostility and its impact on firm performance. While previous studies have considered environmental hostility from a holistic standpoint, this study examines four factors associated with environmental hostility, providing a systematic understanding of the impact each determinant on firm innovation and financial performance. Second, by disseminating and exploring the inherent differences between hostility factors, this approach provides a more transparent understanding of how firms align strategic orientations depending on the type(s) of hostility they are facing. Previous literature has explored the links between environment and strategic orientations; however, this will be the first approach where environmental hostility takes the alignment of business-level strategic orientations into consideration in tandem with firm performance outcomes.

This study is exclusive in that it explores and differentiates among multiple environmental hostility facets and analyzes them through different firm performance measures. Additionally, this research incorporates a theoretical perspective from strategy literature (Contingency Theory) to study the implications of environmental hostility and the role of smaller manufacturing organizations, meeting a calling from the literature to explore these relationships (Dangayach & Deshmukh, 2001). This approach, in tandem with work from previous endeavors regarding environmental contingencies, meets the calling by providing specification and categorization surrounding hostility issues.

The following section explores traditional environmental hostility research, moving towards a systematic understanding of how the different determinants of hostility function. Next, a developed framework and hypotheses for the influences of environmental hostility on strategic orientation and firm performance measures is provided. The final section explains the proposed methodological approaches and research design.

ENVIRONMENTAL HOSTILITY OVERVIEW

Firms operating under environmental hostility are constantly facing threats towards their survival (Hall, 1980; Zahra, 1993). For purposes of providing clarification, environmental hostility is defined as an environmental dimension which is classified as risky, stressful, and dominating—containing precarious industry settings and harsh overwhelming business climates that pose a threat to firm viability and performance. Plainly put, hostile environments are unfriendly and frustrating. High failure rates are characteristic of hostile environments, brought about by severe competitive intensity—exacerbated by low customer loyalty (Hall, 1980). According to Potter
Kach et al. Impacts of Environmental Hostility on Performance

(1994), survival within hostile environments requires “the ferocity of a prizefighter and the endurance of a marathon runner.” The severity of the situation escalates when considering that hostility is a multifaceted environmental dimension, manifesting itself through multiple determinants, each exhibiting different impact levels dependent on global region and market structure (Ward, Duray, Leong, & Sum, 1995; Amoako-Gyampah & Boye, 2001).

Environments are continuously evolving and becoming increasingly hostile, responding to advances in technology and manufacturing processes (Yasaiardekani, 1989; Castrogiovanni, 2002). For example, increasingly efficient global communications and information transparency have increased the body of knowledge among firms, allowing for pieces of information to be pulled together quicker and more efficiently, creating greater competition though idea generation and innovative new product developments (Brahm, 1995; Pitt & Morris, 1995). Firms positioned in environments containing high levels of hostility may experience greater difficulty when accepting and adopting new strategies (Autry, Graye, Daugherty, & Richey, 2010). Additionally, governmental regulatory rules and policies imposed upon firms also have significant impacts on manufacturing capabilities and performance (Piatier, 1984; Madrid-Guijarro, Garcia, & Van Auken, 2009) and organizations may find it challenging to innovate in environments where regulations are stringent or constantly changing (Greenstein & Mazzeo, 2006; Carbonell & Rodriguez-Escudero, 2009). Clearly, environmental hostility can have major impacts on strategic operations and performance within organizations.

While each study includes similar definitions of environmental hostility, based mainly off the seminal work of Khandwalla (1972; 1977), each contain slightly different determinants associated with their definitions. Where some studies place more emphasis on competition, others focus on resource scarcity, and yet others on multiple determinants taken in tandem within the study. Additionally, despite the multiple determinants of environmental hostility identified throughout the literature, previous research endeavors surrounding environmental hostility have either taken a holistic approach or been particularly focused on a singular hostility determinant. Both these approaches make it much more difficult to understand the impacts of environmental hostility on firm performance and how different determinants may impact strategy and performance outcomes differently. To facilitate better understanding of the influences of environmental hostility, different determinants should be addressed through a systematic lens. However, addressing all of the determinants of hostility would be very time consuming and may offer information that is difficult to decipher and implement by managers and researchers alike. Therefore, a parsimonious yet robust approach is needed when considering the influences of hostility within a firm’s operating environment.

The following section explores four different determinants of environmental hostility and their influences on firm performance. The following factors were considered through an examination of the different determinants of environmental hostility over the past 40 years, highlighting the four most distinguished and influential types of environmental hostility.

Table 1: Environmental hostility types

<table>
<thead>
<tr>
<th>Environmental Hostility Types</th>
<th>Supporting Literature</th>
</tr>
</thead>
</table>

83304
Resource Scarcity (Labor Shortages, Materials, Financial)  
Resource scarcity within organizational external environments impacts the survivability and development of firms operating under particular contexts (Pfeffer & Salancik, 1978; Randolph & Dess, 1984). A major element of environmental hostility, commonly known as environmental munificence or resource scarcity, has been widely defined as the wealth or scarcity of important resources required by organizations operating under particular environmental settings (Staw & Szwarzkowski, 1975; Randolph & Dess, 1984). Organizational task environments were first used to describe environmental munificence as a resource capacity function (Dess & Beard, 1984); however, Yasaiardekani (1989) argued that there should be increased attention paid towards the direct linkages between firms facing resource scarcity and the environment. Since then, the concept of resource scarcity has been classified as the extent to which a firm can interact with and support sustained growth based on the environment around them. Therefore, resource scarcity has become a viable environmental dimension for firms when appropriating and reacting to a lack of available external resources.

Scarcity of resources has important implications for firm strategy making policies and performance for several reasons. First, organizational flexibility and strategic options are greater when higher levels of munificence exist within firm operating environments (Tushman & Anderson, 1986). The availability of resources under this context allows for firms to pursue endeavors other than survival. Second, when resources become increasingly difficult to acquire, competition among firms becomes more prominent (Dess & Beard, 1984) negatively impacting firm profitability and creating greater product delivery pressures (Beard & Dess, 1981; Singh, House, & Tucker, 1986). Third, when operating under munificent environments that contain relatively low amounts of uncertainty, firms may find it easier to establish close relationships with suppliers and allocate greater resources towards meeting consumer demands (Jawahar & McLaughlin, 2001). Clearly, there is a notable correspondence between resource scarcity and the successfulness of business performance, creating cause for concern regarding the appropriate alignment of strategic orientations within firm operating environments.

Recycling firms provide an example of the impacts of this type of environmental hostility factor. While many recycling programs are regarded as a growing trend among consumers and businesses alike, environmental consultants have predicted that certain areas of the U.S. are facing major shortages of waste products. This concern among manufacturers regarding waste product shortages is already leading to fierce competition among organizations over resources,
many of which are already struggling to obtain the necessary materials required to meet net revenue expectations.

**Restrictiveness**

Government policy, regulations, and social pressures can have a major impact on an organization’s innovation endeavors and NPD performance outcomes, predominantly in emergent economies (Hadjimanolis, 1999). When firms feel increased pressures from regulatory measures such as licensing, certification processes, and organizational qualifications; there are tendencies for product development projects to become postponed or abandoned (Galia & Legros, 2004). Government action in developing economies has been estimated to cause circa half of the difficulties experienced by firms conducting innovation and NPD processes, especially regarding distribution channels and exports (Hadjimanolis, 1999). Recent studies have shown that influences from governmental mechanisms can stunt the growth of organizational networks (Robinson & Stuart, 2007; Oke, Idaigbon-Oke, & Wajumwba, 2008), reducing the success of innovative procedures. A study of 294 managers in Spain revealed that uncertainty surrounding the changes or increases in government policies negatively impacted NPD performance (Madrid-Guijarro et al., 2009).

However, there are also indications in foreign countries and emerging markets that government influences can take positive effect. Piatier (1984) indicated that a lack of government assistance can be detrimental to firm survival and NPD performance outcomes in hostile environments. Studies in China have indicated that organizations that do not operate under the support of their governments have a lower chance of succeeding then those who actively seek assistance (Zhao, Sum, Qi, Zhang, & Lee, 2006). Ultimately, restrictive influences seem to impact organizations differently, dependent on the regional setting and country that the manufacturing processes are taking place.

Cigarette manufactures in the United States face high amounts of social, political, and restrictive hostility. Specific mandates from the government prohibit the sales of cigarettes to individuals under the age of 18 and limit the types of advertising that can be displayed throughout the country. High taxes and tariffs placed on the manufacturing and sales of these products are also evident when comparing the cost of resources and product creation value to the overall sales value. Additionally, social pressures from city groups and lobbyists have shed a negative light on organizations that manufacture cigarettes and other tobacco based products. However, it should be noted that cigarette manufacturers operating outside the United States do not face the same level of restrictive pressures.

**Competition**

This dimension of environmental hostility alludes to the intensity of competitive pressures facing a firm from the principle or secondary markets that they interact and engage in. Competition has been identified as the number of firms in an organization’s industry fighting for similar market shares, commonly associated with smaller profit margins and reduced maneuverability (Miller & Friesen, 1983). Hostile environments contain levels of competition that are overwhelming and difficult to manage. Survival can be even more difficult. When competition is fierce, organizations must become increasingly innovative in both products and processes, differentiating themselves from their competitors by exploring new and diverse markets (Zahra,
1993). Previous research has indicated that intense competitive environments generally lead to new firm ventures, mainly through innovative tendencies (Adler, 1989). Additionally, smaller firms are likely to face more challenging influences from competitive forces in their current operating markets than larger firms (Amoako-Gyampah & Boye, 2001). More specifically, when facing new entrants and rival competition from the opening of new markets, smaller firms must extend their reach by developing into previously unexplored markets (Nooteboom, 1994).

Literature has suggested that greater competitive environments promote more strategic experimentation as management and project teams are motivated to discover viable market niches for their organizations (Nicholls-Nixon et al., 2000). When environments exhibit higher levels of competitive hostility, pressures are placed on organizations to become increasingly efficient and effective regarding decision making processes and strategic initiatives (Miller & Friesen, 1978). Strategic orientations are likely to be impacted and change depending on the level of competitive force. However, it is also important to note that the more intense the levels of competition facing an organization, the more likely the firm will encounter difficulty identifying what needs to be done and how to implement the necessary changes (Nicholls-Nixon et al., 2000).

Computer hardware manufacturers provide an example of operating in competitively hostile markets. Brown and Eisenhardt (1997) mentioned that this particular industry faces extreme levels of competitive pressures from other firms competing for market share. Acquisitions and buy-outs are commonplace for organizations operating in this market, forcing firms to stay routinely innovative and cutting edge in order to survive. Seeking out new markets in this field is absolutely essential and falling behind the competition will most certainly result in loss of market share and potentially even bankruptcy.

**Declining Market Trends**

Markets differ significantly in the number of competing firms because they contain bandwagon effects, economic factors, and the attractiveness of the market at any given time may influence the number of firms competing (Pfeffer & Leblebic, 1973). However, declining trends in an organization’s given operating market can be discouraging, creating business environments that are difficult to understand and even more difficult to respond to (Wolff & Pett, 2006). Declining trends generally lack demand pull, which has been considered an antecedent emphasizing innovative tendencies to develop new product developments and improvements (Zahra, 1993). Organizations under this type of environmental hostility will also have difficulty maintaining customer loyalty during these market downturns, making it difficult to identify appropriate arenas for new entrepreneurial activities within these markets.

Economic declines and recessionary periods are also an influence on declining market trends (Khandwalla, 1977; Goll & Rasheed, 1997). When the economy is flourishing, customers are more likely to purchase consumer discretionary and luxury goods. However, when the economy is poor consumers will focus on staple goods and necessities instead, creating a decline in the purchase of certain commodities. Firms in the manufacturing industry can be negatively impacted by these types of declining trends, forcing them to reduce prices in order to increase product attractiveness or exploring other avenues for generating revenue.
Organizations involved in the homebuilding industry have faced declining market trends over the past 5 years. With the demand for new homes in decline, many manufacturing firms within this industry sector have faced revoked contracts, loss of customer base, and reduced supplier and customer loyalty. Additionally, suppliers of the homebuilding market have felt the pressure of reduced sales, turning their efforts towards other markets in order to rebound. GE for example has been focusing on energy contracts and aircraft engines instead of home appliances and furnishings.

**Performance Outcomes under Environmental Hostility**

Literature has considered the impact of environmental hostility on firm performance from two main perspectives: Financial and innovation (Calantone et al., 1997; Covin, Slevin, & Heeley, 2000). Direct linkages between environmental hostility and firm performance outcomes have not been studied in great detail for two reasons. First, environmental hostility creates threatening situations for firms that does not readily offer opportunities for arbitrage (Hall, 1980; Potter, 1994). Research has indicated that firms operating under benign environments are more profitable than those experiencing hostile environments, even when innovation is not pursued (Kotha & Nair, 1995). Second, examining the influences of environmental hostility on firm performance stand alone would be inappropriate because the potential variance explained by lurking variables, such as industry setting, level of innovativeness, and strategic orientation would be seemingly ignored. Many smaller firms facing hostility initiate responses toward their environment by making central and peripheral changes to their strategic orientations (Nicholls-Nixon et al., 2000).

**Innovation**

The definition of innovation is understood to be ‘an iterative process initiated by the perception of a new market and/or service opportunity for a technology based invention which leads to development, production and marketing tasks striving for the commercial success of the invention’ (Garcia & Calantone, 2002 p. 112). Past innovation studies have shown that there exists a positive relationship between the quantity of NPD activities within an organization and the overall success rates (Cooper & Kleinschmidt, 1994; Calantone et al., 1997). Overall, effectively executing highly novel NPD projects require greater levels of flexibility, responsiveness and incorporation of new information (Griffin, 1997; Vandenbosch & Clift, 2002).

Determinants of environmental hostility have been shown to have different impacts on NPD performance within organizations, dependent on the type of hostility encountered. Katila and Shane (2005) noted that competition has a positive impact on the development of new products while resource scarcity tends to have a negative impact on innovation. Other studies have followed holistic approaches towards understanding environmental hostility and found that firms pursuing NPD activities during hostile environments performed better than those who were not (Miller & Friesen, 1983; Covin & Slevin, 1989).

**Financial**
Many researchers purport that financial performance is a multidimensional construct, containing different outcomes that are realized from different influencing factors (Vickery, Droge, & Markland, 1993). Sales growth and profitability are important financial indicators of a firm’s health when considering environmental dimensions (Wolff & Pett, 2006). However, the two have been considered among scholars to be distinctive in nature (Venkatraman & Ramanujam, 1987). Organizations following risky strategies may sacrifice short-run profitability for growth. Furthermore, environmental conditions may play a large role in these risky decisions (Covin & Slevin, 1989), motivating firms to generate cash flows to cover expenses in favor of growth over profitability. Smaller firms are especially sensitive towards these adjustments because they have tendencies to invest organizational resources in the development of new products or production process improvements (Wolff & Pett, 2006). By investing internally, firms can improve operational efficiencies and therefore generate growth through competitive advantages.

**LINKING STRATEGY AND ENVIRONMENTAL HOSTILITY**

Business-level strategic orientations are important considering that the tendency to perceive environments as containing greater hostility may generate a lack of confidence among managers, creating contextual environments where faulty decisions are viewed as increasingly consequential, causing potential decision making delays (Bstieler, 2005). Environments that contain benign levels of hostility provide firms with more opportunities to develop additional capabilities and more proficient supplier relationships (Harrison & St John, 1996; McEvily & Zaheer, 1999); therefore, allowing firms the opportunity to innovate and develop products more proactively (Aragon-Correa & Sharma, 2003). When environments become increasingly hostile, faulty decisions are viewed as highly damaging and strategic orientations are likely to change, increasing the direct control of top level management and reducing the level of communications (Yasaiardekani, 1989). When such conditions are experienced, managers will require additional time in order to fully understand the inherent risks involved, reflect upon potential alternatives, and reach out to any viable solutions that may exist (Karlsson & Ahlstrom, 1999). Additionally, greater levels of environmental hostility may produce increased perceived uncertainties, where managers may become hesitant to proceed with a particular decision (Gupta & Wilemon, 1990). Therefore, understanding how different environmental hostility determinants impact business-level strategic orientations can better prepare managers with the appropriate tools for making increasingly transparent decisions.

In the late 1970’s, Miles and Snow (1978) purported four strategic business orientations: Prospectors, defenders, analyzers, and reactors. The aforementioned are explored below:

**Defenders**

Defenders deliberately create stability through multiple decisions and processes which reduce the organization’s vulnerability to environmental contingencies. They target markets that are stable and consistent, producing a large array of products to satisfy the demands of their particular customer base. Firms following a defender strategic orientation experience growth by moving deeper into their current markets through cost-efficient technology and reducing focus on monitoring developments outside their market domain (Miles & Snow, 1978).
Defenders are generally already operating at high efficiency; therefore, a lack of human, financial, or physical resources would have a great impact on firm performance outcomes. The slightest change in pricing due to constraints could cause a myriad of problems for the firm. Defenders are technologically savvy and prepared to meet increased competition through process improvements and re-engineering efforts. However, when rivalry is fierce firms must differentiate themselves by exploring new markets and creating new products (Zhara, 1993). Highly efficient processes generally reduce modularity and flexibility within the manufacturing system, making it difficult to respond to required governmental changes. Lack of product innovation makes it difficult for firms following a defender orientation to stay routinely innovation on the NPD frontier. A declining market trend within this strategic orientation would be detrimental, forcing firms following this approach to consider other markets and production avenues. For example, Kodak suffered for many years after traditional film was phased out for digital platforms. Therefore;

Hypothesis 1a: Firms will be more likely to follow a defender orientation when facing lower levels of environmental hostility from resource scarcity, competition, restrictiveness, and declining market trends.

Prospectors

Lack of financial capital, knowledge workers, and materials can all be detrimental towards innovation and NPD, especially if the firm is concerned about time to market issues and speed. However, research has shown that organizations following a prospector strategic orientations can benefit from a lack of resources through bricolage, effectively creating something out of nothing (Baker & Nelson, 2005). Prospectors welcome environmental fluctuations, increased competition promotes them to work harder at producing NPD and capturing the market share (Katila & Shane, 2005). Flexibility in their approaches towards NPD would allow for the firm to make adjustments regarding social or political issues that arise. Prospecting firms have an advantage over other firms who do not place as much emphasis on flexibility because they can make changes much more quickly based on environmental changes. Declining trend would be viewed as an opportunity by prospectors to understand why the changes are taking place within the markets.

Hypothesis 1b: Firms will be more likely to follow a prospector orientation when facing higher levels of environmental hostility from resource scarcity, competition, restrictiveness, and declining market trends.

Analyzers

A hybrid structure of both efficient and responsive systems makes dealing with resource scarcity much more manageable. Lack of resources will most likely be met by expanding out into markets with more munificent environments (Bettis, 1981), exchanging efficiency for flexibility. Where defenders and prospectors are locked into specific sides of the spectrum, either highly efficient or highly flexible respectfully, analyzers operate on both fronts and have more room to shift their focus of operations when faced with lack of resources and greater competition. Analyzers are prepared to defend their existing product lines through efficiency and marketing flexibility, viewing competition as a greater opportunity for imitation (McEvily & Zaheer, 1999).
Analyzers evaluate the markets and situation first before planning and acting. This allows for them to assess whether or not competition are too difficult to manage before moving forward with a project. However, facing restrictive environmental pressures may postpone decision making processes, especially when considering that analyzers evaluate first and then enter the planning stage before acting, causing for loss in market shares. While restrictiveness facing current product lines can be managed through flexible systems and process changes, governmental and social constituents may deter analyzers from markets that would otherwise prove to be profitable (Hadjimanolis, 1999). Analyzers rely on a core customer base for their stable component in order to fund their exploration and innovation for their flexible component. Declining trends are likely to negatively impact the existing customer base, resulting in less funding for NPD and new markets exploration (Miles & Snow, 1978 pg. 78). Additionally, following an already declining product trend would likely result in poor sales, especially when considering that analyzers do not have the first mover advantage.

Hypothesis 1c: Firms will be more likely to follow an analyzer orientation when facing higher levels of environmental hostility from resource scarcity and competition and lower levels of environmental hostility from restrictiveness and declining market trends.

Strategic Orientation and Performance

Organizations can achieve viable performance outcomes through a variety of effective strategic orientations (Doty, Glick, & Huber, 1993). As depicted by Beard and Dess (1981), proper implementation of corporate and business level strategies is conducive towards healthy firm performance. Taking this a step further to the functional and manufacturing strategic levels, multiple research streams have indicated that this top-down bottom-up approach provides an increasingly transparent depiction of how business-level strategic orientations are pursued (Miller, 1988). In order to highlight the importance between environmental hostility determinants, strategic orientations, and performance—examination of the significance of the path from firm strategic orientations to performance must first be identified. Therefore:

Hypothesis 2a: Business-level strategic orientation has a direct influence on financial performance outcomes.

Hypothesis 2b: Business-level strategic orientation has a direct influence on innovation performance outcomes.

Linking Environment, Strategic Orientation, and Performance

Organizations operating under a more conservative strategy are more likely to focus their efforts towards targeting a specific market when operating under relatively benign environments (Miller & Friesen, 1983). Under this operating environment, organizations generally exhibit lower levels of product and process innovation mainly because competitors are not pursuing strategic changes in their operations (Kabadayi, Eyuboglu, & Thomas, 2007). However, when challenged with hostile environments, efficiency becomes a priority for firms who are not highly differentiated, motivating them to lower costs and bolster production process innovation levels (Ward, Bickford, & Leong, 1996). While lower levels of hostility lead to greater financial performance and growth, greater levels of hostility encourage firms following defender strategies to become increasingly innovative among their processes in order to compete in local and global markets.
However, the general lack of manufacturing flexibility among more conservative firms may constrain production effectiveness and efficiency when pursuing new product developments. Encountering this situation would reduce overall profitability. Therefore:

Hypothesis 3a: Firms following a defender orientation will experience greater financial performance when facing lower levels of environmental hostility from resource scarcity, competition, restrictiveness, and declining market trends than when faced with greater levels.

Hypothesis 3b: Firms following a defender orientation will experience greater innovation performance when facing higher levels of environmental hostility from resource scarcity, competition, restrictiveness, and declining market trends than when faced with lower levels.

Alternatively, prospectors are driven to be increasingly innovative when faced with greater levels of competition, scarcity of resources (Baker & Nelson, 2005; Katila & Shane, 2005), restrictiveness, and declining market trends (Badri & Davis, 2000). Opposite to defenders who insulate themselves from environmental contingencies, prospectors are said to manipulate and direct environments in order to cater to their needs (Miles & Snow, 1978 Pg. 59). Prospectors are just as aggressive as defenders when it comes to developing their current markets; however, by enthusiastically locating and exploring new markets they are able to stay on the leading edge.

Many times when facing resource scarcity issues, true prospectors will find ways to develop new products through bricolage (Baker & Nelson, 2005), effectively innovating with the materials they have readily available. Competition has also been cited to lead towards greater innovation by prompting prospective firms to create new designs and products to meet customer demands (Bettis & Hitt, 1995). Restrictiveness may be a blessing in disguise for prospectors. Government restrictions, regulations, and social constituents may many times provide opportunities for firms following a prospector strategic orientation. Take CalAuto, an OEM automotive parts manufacturer in California who was making cruise control units for vehicles. They discovered that when government regulations mandated vehicle emissions levels to be strictly regulated in California, they were able to combine their knowledge of the area with technology from their cruise control units to create exhaust sensors for vehicles. Therefore:

Hypothesis 3c: Firms following a prospector orientation will experience greater financial performance when facing higher levels of environmental hostility from resource scarcity, competition, restrictiveness, and declining market trends.

Hypothesis 3d: Firms following a prospector orientation will experience greater innovation performance when facing higher levels of environmental hostility from resource scarcity, competition, restrictiveness, and declining market trends.

While it has been mentioned that prospectors and defenders operate at opposite sides of the strategic continuum; analyzers fall between the two extremes, operating as a hybrid of both defenders and prospectors. Similar to prospectors, analyzers are likely to explore new opportunities and move forward with innovative tendencies when faced with resource scarcity. Similarly, like defenders, technological improvements for existing product lines are at the forefront of an analyzer’s agenda. Analyzers thrive from competitive markets, finding new
solutions to problems and entering into new markets after their prospective counterparts, creating increasingly efficient product lines at lower costs to the consumer.

However, analyzers are not entirely insulated from environmental contingencies. Because of their propensity to operate under a “dual technological core” (Miles & Snow, 1978 pg. 73), that is maintaining a stable component similar to a defender and a flexible technological component similar to a prospector, makes them vulnerable to certain types of environmental hostility. When facing restrictiveness, analyzers may shy away from potential projects that prospectors would otherwise and likely have otherwise, already approached and initiated. Similar to defenders, current product lines are impacted by increased restrictiveness. Analyzers may actually be even more adversely impacted by this type of hostility than defenders due to their greater level of flexibility associated with manufacturing, resulting in greater overhead and operating costs when changing processes.Declining market trends may also negatively impact analyzers, reducing the demand for their existing product lines while also damaging returns from prospective new product offerings. Therefore:

Hypothesis 3e: Firms following an analyzer orientation will experience greater financial performance when facing higher levels of environmental hostility from resource scarcity and competition and when facing lower levels of restrictiveness and declining market trends.

Hypothesis 3f: Firms following an analyzer orientation will experience greater innovation performance when facing higher levels of environmental hostility from resource scarcity and competition and when facing lower levels of restrictiveness, and declining market trends.

**Figure 1:** Theoretical framework
METHODOLOGY

Sample and Data Collection

Data is currently being collected from manufacturing firms in the Southwest United States. Firm selection criteria includes organizations that have a primary or sole manufacturing business unit. In order to obtain results that are accurate regarding the manufacturing operations of the firm, top executives (e.g. operations directors, general managers, and vice presidents) will be the target audience for the survey. Previous studies utilized similar candidates because they generally have extensive knowledge and high levels of responsibility within their respective companies (Ward et al., 1995; Amoako-Gyampah & Boye, 2001). Subjects engaging in this study will be asked to complete a mail survey addressing 4 dimensions of environmental hostility, 3 forms of business-level strategic orientations, and 2 firm performance outcomes. Psychometric properties of each scale will be assessed accordingly.

This study will use a theory-driven scale development approach since this method generally provided greater reductions in measurement and interpretation errors than a criterion-referenced approach (Nunnally & Bernstein, 1994). Data collection will involve 7-point Likert scale survey based measures for environmental hostility, strategic orientation, and performance outcomes. The variables mentioned that are under investigation have been defined throughout the body of the paper. There are four independent variables: Resource scarcity, competition, declining market trends, and restrictiveness. Dependent variables are firm performance outcomes: Innovation performance and financial performance—both of which will be captured through objective and subjective measurements. The mediating variables include three dimensions of strategic orientation, captured through a modified version of a previously established survey (Hambrick, 1981; Golden, 1992).

Research Design and Analytic Strategy

In order to test the hypotheses developed in this paper, data for this study will be collected by a means of survey administration and analyzed through SPSS 18.5 and AMOS 18 software platforms (Byrne, 2001; Blunch, 2008). Factor analyses will be conducted on the items within each scale in order to determine whether the items represent multiple constructs. More specifically, an exploratory factor analysis will be used to analyze the components of the newly designed environmental hostility scale, since these items constitute new scales in the application of environmental factors. The remaining scales will be examined under a confirmatory factor analysis to determine the validity of each in their particular context.

As suggested in the two-step process by Anderson and Gerbing (1988), once the scales have been examined through factor analysis, the statistical procedure of Structural Equation Modeling (SEM) will be used to analyze the data. This will allow for the examination of the proposed mediated model at multiple levels: Direct effects of environmental hostility on strategic orientation and firm performance outcomes as well as the mediating effects of each of the antecedent variables (See Figure 1). The proposed methodological design for mediation testing is commonly used in managerial areas (Wood, Goodman, Beckmann, & Cook, 2008) along with a plethora of other fields, including marketing, psychology, and sociology. More specifically, Operations Management research has previously observed the direct and indirect effects of
environmental contingencies on organizational strategy through path modeling and SEM (Ward & Duray, 2000).

As a first step, a measurement model including all of the variables will be assessed using AMOS maximum likelihood procedure (Arbuckle & Wothke, 1999). Generally acceptable “goodness of fit” indexes, including Chi Square ($\chi^2$), Chi Square Change ($\chi^2$/d.f.), incremental fit index (IFI), normative fit index (NFI), Tucker-Lewis Coefficient (TLI), comparative fit index (CFI), standardized root-mean square residual (SRMR) and root mean square error of approximation (RMSEA) will be reported accordingly. Acceptable values close to or below 0.06 for RMSEA and at or above for 0.90 for IFI, NFI, TLI and CFI are generally considered as good fit (Hu & Bentler, 1999; Hair, Black, Babin, Anderson, & Tatham, 2006).

Pilot Study

A pilot study was conducted prior to initiating the formal data collection process to assess the content of the items within the newly developed four-factor environmental hostility scale. The newly developed environmental hostility scale was administered in tandem with the holistic Khandwalla (1977) 3-item scale. Operations directors and general managers were asked to complete the pilot survey and provide any feedback that they believed may help advance the survey (e.g. personal insight regarding items that were missing, confusing, misleading, poorly worded, etc.). In response to the feedback received, changes were made to the data collection instrument respectively, including revised verbiage surrounding three resource scarcity items, additional subjective process and product innovation measures, and control variables for dynamism and industry type.

Control Variables

This study includes control variables that may have a notable impact on the relationships observed within the theoretical and structural models in this paper. The size of an organization is often considered influential on innovation practices and performance levels (Kimura, 2002). Size was controlled for using total number of employees. Industry was controlled for since there may exist technological differences among sectors that may change the speed of progress throughout organizations (Geroski & Machin, 1992; Carillo, 2005). Firms with greater maturity may have better established practices and relationships that may influence the impact that environmental hostility has on business-level strategic orientation; therefore, this study controls for this factor. Number of different products could significantly diminish or skew the interpretation of the reported performance outcomes of the firm; therefore, this is being controlled for through an objective measure. Finally, environmental dynamism was controlled for throughout the model.

RESULTS

This study is currently in the data collection phase, we expect to have all responses collected by the end of May and final analyses and results reported shortly afterwards.

REFERENCES


Hadjimanolis, A. (1999). Barriers to innovation for SMEs in a small less developed country (Cyprus). *Technovation*, 19(9), 561-570.


