Natural Environment, Market Orientation, and Firm Innovativeness: An Organizational Life Cycle Perspective

by Clay Dibrell, Justin Craig, and Eric Hansen

Drawing upon the corporate social responsibility literature, we investigate the moderating effects of the natural environment and the stage of an organization’s life cycle on the market orientation to firm innovativeness relationship. Through 229 owners or chief executive officer respondents, our results establish evidence of (1) a positive linkage between market orientation and firm innovativeness; (2) natural environmental policy positively moderating the market orientation to firm innovativeness relationship; and (3) organizational life cycle negatively moderating market orientation to innovativeness. Our findings suggest ventures characterized as being early in the organizational life cycle are more likely to have a positive environmental policy toward the natural environment leading to a competitive advantage through firm innovativeness.

Introduction

Changing concerns toward the natural environment are influencing business relationships and practices (Craig and Dibrell 2006; Dibrell, Craig, and Hansen 2011; Gerrans and Hutchinson 2000; York and Venkataraman 2010). Even so, there is limited understanding as to why a firm adopts environmental management practices (Klassen 2001; Rivera-Camino 2007). Motivated by both these concerns and this limited understanding, in this study, we explore, using the corporate social responsibility (CSR) literature as our frame, previously understudied relationships among a firm’s market orientation, firm’s natural environmental policy, organizational life cycle, and innovativeness within the context of small to medium-sized enterprises (SMEs).

Clay Dibrell is an associate professor of Management in the School of Business Administration at The University of Mississippi.

Justin Craig is an associate professor of Entrepreneurship and co-director of the Australian Centre for Family Business in the School of Business, Technology and Sustainable Development at Bond University.

Eric Hansen is a professor of Forest Products Marketing in the College of Forestry at Oregon State University.

Address correspondence to: Justin Craig, Department of Entrepreneurship and Family Business, Bond University, Gold Coast, Qld 4229, Australia. E-mail: jcraig@bond.edu.au.
Variously referred to as corporate citizenship (Maignan, Ferrell, and Hult 1999), corporate environmentalism (Banerjee 2002), and environmental strategy (Aragón-Correa 1998; Aragón-Correa et al. 2008; Sharma and Vredenburg 1998), natural environmental policy is a CSR construct that adds to how managers orientate their firms in response to shifting societal expectations regarding firm environmental performance (Chan 2005; Hillman, Keim, and Schuler 2004). Likewise, managerial attitudes toward environmental protection are evolving as consumers are demanding greater CSR (Banerjee, Iyer, and Kashyap 2003; Menon and Menon 1997). Notably, in some instances, responses to these changed perspectives have been linked to an increase in firm’s financial performance (Craig and Dibrell 2006; Russo and Fouts 1997).

In practice, therefore, this response means that companies of all sizes are participating in a variety of activities ranging from implementing environmental management systems to sustainability or environmental reporting, to philanthropic giving (Cordano and Frieze 2000; Varadarajan and Menon 1988). As firms recognize, manage, and reduce environmental impacts, evidence is mounting that they can potentially reap competitive advantages (Chen 2008; Hart 1995; Porter and van der Lind 1995; Russo and Fouts 1997), which is captured in this research vis-à-vis a firm’s innovativeness.

Utilizing the CSR, organizational life cycle, and market orientation literatures, we investigate how a firm’s environmental policy and stage of the organizational life cycle interact with the market orientation to firm innovativeness relationship. The CSR literature allows us to explain the construct, natural environmental policy, and to connect the concept to firm innovativeness. We then utilize the organizational life cycle and market orientation literatures first to hypothesize whether a firm’s environmental policy enhances the effect of market orientation on firm innovativeness and then move to examine further whether this relationship differs dependent on the stage of organizational life. As such, our research question is as follows: How does a firm’s environmental policy, in concert with market orientation, impact firm innovativeness over the life cycle of the firm? Addressing this question contributes to the SME context conversations linking similar constructs, specifically Verhees and Meulenberg (2004) and Baker and Sinkula (2009).

Our paper proceeds by first introducing the extant literature underpinning our arguments. Hypotheses are presented concurrently. Then, the methodology and sample that we use to test these hypotheses are canvassed. Our results precede the discussion and implications sections, followed by what we see as the paper’s limitations. Lastly, we share our further research plans.

Previous Literature

In the following sections, we outline the proposed relationships among market orientation, natural environmental policy, organizational life cycle, and innovativeness. As discussed earlier, we use the CSR literature as our frame. Although market orientation has shown to impact positively firm innovativeness (e.g., Han, Kim, and Srivastava 1998), Grinstein (2008) suggests that our understanding of the relationship is limited. A theme of corporate environmentalism identified by Banerjee (2002) is being responsive to stakeholders. Customers, as one stakeholder group, are a key focus for market-oriented companies. In other words, a socially responsible and a market-oriented firm will innovate to meet customer requirements for products and services, as well as social and environmental performance. Similarly, the organizational life cycle stage may influence a firm’s innovativeness, as well as its CSR behaviors.
Consider, for instance, the recent development of locavores, which is based on socially responsible consumers preferring to eat food that is locally grown to reduce the environmental costs associated with transporting the food from distant regions (Matthews 2009). Locavores have spawned renewed interest in farming with a dramatic increase in the number of small farms (U.S. Department of Agriculture 2007). Similarly, these consumers are willing to pay a premium for this product. Whereas larger grocery stores may have a more difficult time finding shelf space for locally grown produce based on long-term contracts with larger producers, as well as the scheduling issues associated with accommodating seasonal growing periods for different food items. In effect, small businesses, which are early in their organizational life cycle, have reacted to the demands of their socially responsible customers by growing and selling new items (i.e., innovativeness) in the local farmer's market. This example illustrates how CSR behaviors, market orientation, and organizational life cycle are related.

**Innovativeness**

Innovation heralds the introduction of new products and processes that, if embraced by the market, will enhance the performance of those firms, which leverage the innovations and, contrarily, will destroy firms that cling to old products and processes (Schumpeter 1934). Schumpeter (1934) first emphasized the importance of innovativeness to characterize entrepreneurship (Bruyat and Julien 2000). More recently, because it reflects an important means by which firms pursue new opportunities (Lumpkin and Dess 2001, 1996), innovativeness has become a staple dimension used in distinguishing a firm's entrepreneurial orientation (e.g., Covin and Slevin 1989; Miller 1983; Miller and Friesen 1982). We define innovativeness as a firm’s willingness to place a strong emphasis on technological developments, new products, new services, and/or improved product lines or processes (Schumpeter 1934; Slevin and Covin 1994). As such, innovativeness leads to innovations that can vary in complexity, ranging from minor changes to existing products, processes, or services to the introduction of new breakthrough technologies that introduce first-time features, offer exceptional performance, or change the rules of the game. Innovativeness is widely seen as a critical organizational competence providing advantages in any competitive market (e.g., Dougherty and Hardy 1996).

**Influence of Market Orientation on Firm Innovativeness**

Market orientation attunes organizations to their general operational environment, allowing them to respond strategically to environmental changes (Kumar, Subramanian, and Yauger 1998). Market-oriented companies develop an in-depth understanding of manifest and latent needs of their customer base as well as actions of competitors and often attempt to satisfy these desires through innovative products or services. Narver and Slater (1990) established a culture-based view of market orientation, characterized by employees who share an approach to their work that emphasizes providing superior value to customers resulting in profit and sustainable competitive advantage. According to this thesis, market orientation consists of three dimensions: customer focus, competitor focus, and interfunctional coordination. The outcome of this multidimensional approach is the increased likelihood of the provision of superior value to customers, a widely considered key for maximizing long-term profitability.

As such, extant research has demonstrated a strong relationship between market orientation and innovativeness.
Influence of Natural Environment Policy on Firm Innovativeness

Russo and Fouts (1997) examined CSR from a resource-based view of the firm’s perspective and argued that environmental performance constitutes a source of competitive advantage. Building on Barney (1991), they argued that corporate socially linked investment in the environment helps firms develop new competences, resources, and capabilities that are manifested in tangible artifacts such as their culture, technology, structure, and human resources (Orlitzky, Schmidt, and Rynes 2003; Russo and Fouts 1997). Shrivastava (1995) further suggests that these types of initiatives rely on significant employee involvement, firm-wide coordination, and a forward-thinking managerial style, all with an identifiable link to innovativeness. This familiarity with innovation and tolerance of ambiguity will also likely contribute to the firm’s ability to respond to external changes, turbulence, and crises (Russo and Fouts 1997).

Differentiating through the use of positive environmental attitudes may also promote investment in research and development (R&D), which, according to McWilliams and Siegel (2000) may result in both process and product innovations. They further highlight that this is valued by some consumers who value the socially responsible attributes of the products they purchase (i.e., product innovation) and others who put efficacy in knowing that their purchases are produced in a socially responsible manner (i.e., process innovation). McWilliams and Siegel (2000) also argue that there is a presumption that firms that actively support the stewardship of the environment are more reliable, and their products are of higher quality.

Sharma and Vredenburg (1998) found that firms with a positive environmental strategy develop unique capabilities such as higher order learning and con-
tinuous innovation. These were seen to be an outcome of environmental responsiveness. Proactive firms in the Sharma and Vredenburg’s (1998) study were found to support opportunity seeking and experimentation in what they refer to as the business/environment interface.

In other words, strong environmental policy may result in enhanced innovativeness as firms are more open to, and aware of, societal/consumer trends and may be more proactive in developing, for example, environmentally preferable products or in improving the environmental performance of manufacturing processes. Moreover, the environmental policy potentially enlarges the field of information considered relevant by a firm thereby increasing the number of ideas that can lead to innovations. Specifically, there is evidence that developing environmentally friendly processes and products requires firms to be more innovative than firms that choose not to pursue environmental actions (Aragón-Correa et al. 2008), and we posit environmental policy will be positively associated with firm innovativeness.

Influence of Organizational Life Cycle on Innovativeness

Firms in the mature stage of their organizational life cycle may have advantages over those in earlier stages. The use of capital in the provision of superior products and services, in the current context, those linked to the environment-related attributes, may result in scale economies because of the substantial fixed costs related to capital investments. Similarly, human resource (i.e., fixed) costs related to the protection of the environment are more easily amortized in more mature firms than they are in firms in the earlier stages. In addition, more mature firms, in particular, those that have taken advantage of their longer tenure, can spread the costs of environment provision over more products and services than can earlier stage equivalents. Examples of this type of economy of scope include protection of the environment-related advertising that can be leveraged across various products but are likely to be linked to the firm.

Applying a slack resources perspective argument, mature firms, those that have survived the perils of start-up, etc., potentially have the slack resources necessary to engage in environmental responsibility and responsiveness (Orlitzky, Schmidt, and Rynes 2003; Ullmann 1985; Waddock and Graves 1997). McGuire, Sundgren, and Schneeweiss (1988) suggest that the availability of excess funds will ultimately drive managerial discretion related to environment initiatives, and these excess funds are likely to be more available to those firms who have cleared the early-stage hurdle.

An additional point that should be considered is the role of organizational life cycle on the role of innovativeness and adapting to changes in the task environment. Quinn and Cameron (1983), Miller and Friesen (1984), Adizes (1979), and other scholars have suggested that organizations may be identified at different stages. For instance, Miller and Friesen (1984) posited five stages of organizational life cycle (i.e., birth phase, growth phase, maturity phase, revival phase, and decline phase), whereas Adizes (1979) articulated seven stages (infancy, go-go, adolescence, prime; mature, aristocratic, and bureaucratic). Although there are differences in stage identification, the basic organizational life cycle of inception, growth, maturity, and decline is reticent through these life cycles.

Firms that are earlier in the organizational life cycle and have an eye toward growth, such as in the adolescence phase, have often been associated with increasing levels of innovation (Govindarajan and Trimble 2005; St. John, Pouder, and Cannon 2003). Similarly, those firms in the later stages of the organizational life
cycle have been linked with decreasing competitive behaviors such as complacency and inertia (Hannan and Freeman 1984; Tripsas and Gavetti 2000) and strategic rigidities (Jennings and Seaman 1994). Specifically, ventures that are in the later stages of the organizational life cycle have increased difficulty overcoming these organizationally systemic barriers to change. Although these slack resources exist for firms in the later stages of the organizational life cycle, we anticipate that SMEs, which are more mature, will have a negative relationship to firm innovativeness.

**Interaction of Market Orientation, Environmental Policy, and Organizational Life Cycle**

In this research, we argue that the relationship between market orientation and firm innovativeness is moderated by a firm’s environmental policy. This interaction is dynamic because, as a strong emphasis on the environment becomes embedded in the internal processes of the firm, this increased focus may provide elucidating opportunities for the organization as it monitors customers and competitors and internalizes this information. A greater environmental emphasis could center the organization on minimizing environmental impacts of the firm and on monitoring changes in environmental issues. As reported already, there is evidence that a focus on the environment may widen the awareness of ideas and opportunities presented by environmental issues and may create an opportunity for increased innovativeness. Thus, it is expected that environmental policy will interact with market orientation to create a more innovative organization.

In relation to organizational life cycle, any new strategic initiative that is introduced, such as one with a strong environment focus, is associated with high initial costs and longer payback periods. If, as has been established, the environment threatens the cost structure of businesses through, for example, compliance-related issues introduced by some industries and by government bodies at state and federal levels (Makower 1993), the life cycle situation of the firm may influence environment strategy-related decisions. For example, earlier stage ventures, which need to demonstrate their commitment to the industry, may be inclined to amortize this cost over a longer period and are more likely to use this as a market-positioning initiative whereas more established firms may not see this as such and may take a more technical bottom line orientated view. An alternate explanation of how these relationships are life-stage influenced relates to the ability of more mature businesses to amortize costs over a wider product range, a luxury not available to less-established firms.

Therefore, in contrast to established firms that have secured strategic direction, brand identity, and legitimacy, earlier stage firms would potentially be more motivated to leverage any investments, including those related to the environment, into competitive advantages through innovation. We suggest therefore that environmental policy will be seen differently by new ventures vis-à-vis those that are established, and that this will influence the relationship to firm innovativeness, and on the basis of this logic, we make the following prediction (Figure 1):

**H2:** The association between market orientation and firm innovativeness is (1) most positive when environment policy is high and organizational life stage is early and (2) least positive when environment policy is low and organizational life stage is late.

**Methodology**

**Sample**

Given the hypotheses and the desire to have a broad perspective of the studied phenomenon, we employed a survey methodology to collect data from firms that, for a large majority of respon-
The food-processing industry was selected for multiple reasons. First, this is a large competitive industry exhibiting a wide variety of strategic orientations for gaining financial success and ventures at different stages of their organizational life cycle. Hoffman (1997) suggested that firms facing a common industry context tend to adopt similar strategies in response to the institutional forces they experience. Therefore, we are able to control for potentially confounding industry effects (Powell 1996).

Second, because the firms in this industry deal with products for human consumption, safety, quality, and consistency are critical components of a firm's reputation (Marcus and Anderson 2006). Third, with increasing awareness by consumers of the industry practices associated with the food chain (e.g., mad cow disease and genetically modified crops), firms working in the food chain, such as food-processing firms, must have a greater awareness of what their customers and competitors are doing to be able to compete successfully.

Fourth, the fastest growing sector in the food-processing industry over the last decade has been the organic food segment (U.S. Department of Agriculture 2009). Organic food processors attempt to reduce their impact on the environment. Further, larger food retailers (e.g., Wal-Mart) are requesting that their food processors provide them with organic foods (Gogoi 2006). The organic trend has created new markets encouraging innovative behavior in reducing the impact on the environment. All of these factors compel food processors to consider the long-term implications of their strategic decisions, making the food-processing industry an appropriate and interesting context to study our hypotheses.

From a randomly identified 4,275 firms operating in the U.S. food-processing industry drawn from a Dun and Bradstreet database, 461 firms were removed because of incorrect addresses or firm failures or policies against completing mail surveys. Drawing upon the approach recommended by Salant and Dillman (1994), two waves of questionnaires, sent four weeks apart, yielded 338 useful responses, resulting in a response rate of 8.8 percent. Each potential respondent was given a personalized cover letter, a questionnaire, a return envelope, and an opportunity to receive a personalized report to respondents for each wave. Although our response rate is slightly lower than rates reported in other
studies (e.g., Ensley and Pearson 2005; Nager, Aronoff, and Ward 1995), it remains within the range of reported response rates of surveys targeting top-management team members (e.g., Hambrick, Gelekanycz, and Fredrickson 1993), which resides between 8 and 12 percent.

Prior research has established that the top-management team members, such as the chief executive, chief marketing officer, or owner of the business, have a comprehensive understanding of the defining variable of the strategic underpinnings of a firm (Vorhies and Morgan 2003). Similarly, numerous studies have reported that SME owners/managers are concerned with their environmental impact (e.g., Groundwork 1995). Naffziger, Ahmed, and Montagno (2003) found support for SME managers with a high level of concern for the environment expend more time and resources on environmental initiatives than those with a low level of concern. To measure this environmental support, we chose only respondents who were the chief executive officer (CEO; \( n = 231 \)) or the owner (\( n = 53 \)) of the firm, resulting in a total of 284 respondents.

To test for nonresponse bias, we tested for differences in the responses between early (wave 1) and late (wave 2) respondents (Armstrong and Overton 1977). There were no significant differences between the two waves among the studied variables, suggesting that nonresponse bias was not evident. In addition, we tested for differences between each wave of respondents and those who did not respond on the measure of firm sales, which was provided by Dun and Bradstreet. Our earlier finding was further validated, as we found no significant differences on the sales measure, suggesting that our sample was representative of the population.

As we were interested in using the strategic leaders of the sampled firms, we tested for any differences between CEOs and owners, as these two groups sometimes have different goals and perspectives (Jensen and Meckling 1976; Oswald, Muse, and Rutherford 2009). To remedy this concern, we tested for differences in responses between the two groups on all of the studied variables. We found no statistically significant differences (\( p > .05 \)) between the groups, suggesting that the responses of the two groups were not different based on their position within the firm.

The use of surveys is often criticized because of concerns associated with common method bias. We attempted to partially diminish concerns for the presence of this bias. We subjected all the items in our study to a factor analysis (Gibbons and O’Connor 2005; Podsakoff and Organ 1986), testing for the dimensionality of the data. If a general factor accounting for a preponderance of the explained variance emerged, then this would suggest that common method bias could affect our results. Using a principal components factor analysis, the unrotated solution produced eight factors, with the first factor accounting for only 23 percent of the 62 percent explained variance. This finding suggests that common method bias is not a serious problem and should not influence our results.

Firms of different sizes and ages were well represented in our data set. The size of the responding firms ranged from one to five employees (\( n = 35 \)) and 100–499 employees (\( n = 38 \)), with the average firm in the sample having between 10 and 49 employees (\( n = 122 \)). The firms’ ages ranged from being in business less than 3 years (\( n = 12 \)), 3–4 years (\( n = 15 \)), 5–8 years (\( n = 27 \)), 9–15 years (\( n = 38 \)), 15–29 years (\( n = 71 \)), and greater than 30 years (\( n = 120 \)).

**Measures**

*Firm Innovativeness.* As suggested by Tajeddini, Trueman, and Larsen (2006) in their study of market orientation and innovativeness, we chose a scale that
included all processes within the firm that are related to creating innovative products or services and has been utilized by other scholars in relation to the environment. To accomplish this task, we utilized a six-item scale from Craig and Dibrell (2006) consisting of the following Likert-type items: (1) developing new products; (2) upgrading existing products’ appearance and performance; (3) producing specialty products; (4) investing in new R&D facilities to gain a competitive advantage; (5) innovation in marketing techniques; and (6) innovation in production processes. The anchors for this scale ranged from 1 = not at all to 5 = very great extent, and had a coefficient alpha of 0.78.

Market Orientation. A 15-item scale was drawn from the earlier work of Narver and Slater (1990) and Lukas and Ferrell (2000). Following the approach employed by Narver and Slater (1990), we summed and averaged the 15-item scale to create a single-market orientation score for hypotheses testing. We conducted the same procedure for all multiple-item scales in the study. Anchors for the scale ranged from 1 = not at all to 3 = to a moderate extent to 5 = to an extreme extent, with the following directions: “Please evaluate each of the following statements with the following phrase in mind: In our operations.” The respondents provided responses for these items: (1) “We constantly monitor our level of commitment and orientation to serving customers’ needs”; (2) “We rapidly respond to competitive actions that threaten us”; (3) “All of our business functions (e.g., marketing/sales, manufacturing) are integrated in serving the needs of our target markets”; (4) “All of our business functions (e.g., marketing/sales, manufacturing) are integrated in serving the needs of our target markets”; (5) “Our salespeople regularly share information within our organization concerning competitors’ strategies”; (6) “All the departments in our business are responsive to each other’s needs and requests”; (7) “Our strategy for competitive advantage is based on our understanding of customer’s needs”; (8) “Top management regularly discusses competitors’ strengths and strategies”; (9) “Our top managers from across the business regularly visit our current and prospective customers”; (10) “Our business strategies are driven by our beliefs about how we can create greater value for customers”; (11) “We target customers where we have an opportunity for competitive advantage”; (12) “We freely communicate information about our successful and unsuccessful customer experiences across our business”; (13) “We measure customer satisfaction systematically and frequently”; (14) “Our managers understand how everyone in our business can contribute to creating customer value”; and (15) “We give close attention to after-sales service.” The coefficient alpha for the scale was 0.88.

Environmental Policy. The five-item scale was provided from earlier scholars (Craig and Dibrell 2006; Klassen 2001). The scale is a measure of a firm’s environmental policy. In effect, how the firm conducts resource-distribution decisions concerning business endeavors and environmental initiatives to protect the natural environment. This scale was deemed the most appropriate for our research, as it captures the strategic policy of the firm toward the environment. This Likert-type scale ranged from 1 = not at all to 3 = to a moderate extent to 5 = to an extreme extent, with the directions asking respondents about their natural environmental policy and the extent of agreement with the following five-item scale (α = 0.79). The items were (1) “businesses need to spend more resources on environmental protection”; (2) “resources should not be devoted to environmental protection because a firm’s profitability will be harmed
(reverse coded)”; (3) “in the future, environmental protection should be seen as part of a firm’s ‘bottom line’”; (4) “business leaders ought to be leading environmental protection efforts”; and (5) “we must protect the environment even if it means that jobs in our community will be lost.” If the firm has a high score for this construct, then this is indicative of the firm having a greater strategic emphasis on the environment. If the respondent has a low score for this scale, then the firm has a weak or indifferent strategic level of importance toward the environment.

Organizational Life Cycle. As many authors have discussed different aspects of the organizational life cycle (e.g., Boeker and Wiltbank 2005; Miller and Friesen 1984; Quinn and Cameron 1983), we adapted a life cycle model measure from Adizes (1979) to form a single-item categorical variable. The wording of the item was slightly modified to reflect more appropriately the food-industry terminology. In contrast to other life cycle models, this one-item measure accounts for distinct stages in the typical life of a company. The respondent was asked to choose one of the following to describe appropriately the stage of their venture’s life cycle: (1) infancy: task-driven risk high and short-term pressures; (2) go-go: moving fast and opportunities abound; (3) adolescence: getting organized and growth cooling off; (4) prime: eager to excel, growth stable, and predictable; (5) mature: no longer eager to excel and integration; (6) aristocratic: urgency lost, formal climate, and external growth; and (7) bureaucratic: everything in writing, rules, and procedures.

Control Variables. We used four control variables as part of our study. To control for the potential confounds of firm size (Milliken, Martins, and Morgan 1998) and age, we collected the necessary demographic data from the respondents. Size was measured by asking the respondents to categorize the firm’s total book value of all assets compared with other competitors in their industry over the most recent year. The five quintile categories were 1 = bottom 20 percent, 2 = next lowest 20 percent, 3 = middle 20 percent, 4 = next highest 20 percent, and 5 = top 20 percent. For the age of the firm (Freeman, Carroll, and Hannan 1983), we utilized six discrete categories (i.e., 1 = less than 3 years, 2 = 3–4 years, 3 = 5–8 years, 4 = 9–14 years, 5 = 15–29 years, and 6 = over 30 years).

In addition, the innovative environment of the firm was controlled for by gathering data on the two measures, namely R&D as a percentage of sale and industry dynamism. R&D as a percentage of sales was measured in comparable technique as total assets and total employees through a one-item measure with the anchors ranging from 1 = bottom 20 percent to 5 = top 20 percent. Firms that devote a greater portion of their resources to R&D might tend to display higher levels of firm innovativeness. Because firms competing in dynamic environments might be required to be more innovative to survive and prosper, we followed Zahra, Neubaum, and Huse (1998) and controlled industry dynamism through a four-item measure. The four items for this scale (α = 0.86) were (1) “extent of overall innovations has been”; (2) “extent of manufacturing innovations in your industry has been”; (3) “extent of product innovations has been”; and (4) “extent of technological innovations has been.” The directions for this scale were the following: “Please indicate your evaluation of change in your industry for each of the following” with the anchors ranging from 1 = very little to 3 = moderate to 5 = very high.

Analysis

For construct validation, we conducted maximum-likelihood confirma-
tory factor analyses for measurement validation (Baumgartner and Homburg 1996). For the regression analysis, the mean scores of the different constructs were employed. To test for moderation, we employed the recommended hierarchical moderated regression analysis using zero-centered variables (Aiken and West 1991; Jaccard and Turrisi 2003). We tested four regression models, where $Y$ is firm innovativeness; $b_1$ is firm assets; $b_2$ is firm age; $b_3$ is R&D as a percentage of sales; $b_4$ is industry dynamism; $b_5$ is market orientation; $b_6$ is environmental policy; $b_7$ is the two-way interaction term of market orientation and environmental policy; $b_8$ is the two-way interaction term of market orientation and organizational life cycle; $b_9$ is the two-way interaction term of environmental policy and organizational life cycle; and $b_{10}$ is the three-way interaction term of market orientation, environmental policy, and organizational life cycle.

**Results**

Table 1 shows that many of the studied variables are correlated with other studied variables providing some evidence of underlying relationships for study. The correlation matrix provides no evidence of multi-collinearity among the studied variables, as the statistically significant correlations (from $p < .05$ to $p < .01$) were within an acceptable range (from $r = 0.13$ to $r = 0.47$). Similarly, we found that the effects of multi-collinearity through the examination of the variance inflated factors (VIFs) were all below 1.5, which was far below the recommended threshold of 10.0 (Lomax 1992), indicating that the effects of collinearity were limited as presented in Table 2. The range of the reported coefficient alphas for the studied factors were all above $\alpha = 0.70$, which are satisfactory (Nunnally and Bernstein 1994).

A series of sequential chi-square models (James, Mulaik, and Brett 1982) were tested including a constrained baseline model, which consisted of the five-factor model being constrained to 1.0 in the $\Phi$ matrix, and the unconstrained five-factor model (i.e., firm innovativeness, market orientation, environmental policy, organizational life cycle, and industry dynamism). For the unconstrained five-factor model, the latent factors were allowed to covary. The unconstrained five-factor model demonstrated the best overall model fit (comparative fit index [Bentler 1990] = 0.95; delta2 [Bollen 1989] = 0.95) and was significantly better than the constrained factor model based on the examination of chi-square differences between the two models ($\Delta \chi^2 = 4904.12$; degrees of freedom $= 10$; $p < .05$). The individual item loadings for each indicator loaded on the respective latent factor construct was statistically significant, with the completely standardized factor loadings ranging from 0.42 to 0.97, with the exception of one item (we target customers where we have an opportunity for competitive advantage) from the market orientation scale that was dropped due to a completely standardized loading below 0.40.

The confirmatory factor analysis results suggest that convergent and discriminant validities were achieved. As the completely standardized factor loadings for the different items were significant ($p < .05$) on the respective factors, this finding is indicative of convergent validity (Bagozzi and Yi 1998; Gerbing and Anderson 1988). Similarly, discriminant validity was achieved as the squared intercorrelations between constructs were below the average variance extracted (AVE) for each construct (Fornell and Larcker 1981). The AVEs for market orientation (AVE = 0.37), environmental policy (AVE = 0.41), and firm innovativeness (AVE = 0.38) approached the recommended level of 0.50 (Fornell and Larcker 1981).

With the validation of the constructs demonstrated, we proceeded to hypoth-
Table 1

Descriptive Statistics, Coefficient Alpha, and Correlation Matrix of the Studied Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>Alpha</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tbody>
<tr>
<td>Innovativeness</td>
<td>3.20</td>
<td>1.06</td>
<td>0.78</td>
<td>0.03</td>
<td></td>
<td></td>
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<tr>
<td>Assets</td>
<td>2.64</td>
<td>1.12</td>
<td>—</td>
<td>—</td>
<td>0.03</td>
<td></td>
<td></td>
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<tr>
<td>Age</td>
<td>4.77</td>
<td>1.46</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0.13*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R&amp;D as Percent of Sales</td>
<td>2.33</td>
<td>1.18</td>
<td>—</td>
<td>0.38**</td>
<td>0.35**</td>
<td>0.01</td>
<td></td>
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<tr>
<td>Industry Dynamism</td>
<td>2.95</td>
<td>0.83</td>
<td>0.86</td>
<td>0.17*</td>
<td>0.14*</td>
<td>0.08</td>
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</tr>
<tr>
<td>Market Orientation</td>
<td>3.62</td>
<td>0.62</td>
<td>0.88</td>
<td>0.27**</td>
<td>0.21**</td>
<td>−0.01</td>
<td>0.24**</td>
<td>0.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Policy</td>
<td>3.17</td>
<td>0.71</td>
<td>0.79</td>
<td>0.16*</td>
<td>0.05</td>
<td>0.00</td>
<td>0.11</td>
<td>0.06</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>Organizational Life Cycle</td>
<td>3.34</td>
<td>1.22</td>
<td>—</td>
<td>−0.31**</td>
<td>0.04</td>
<td>0.47**</td>
<td>−0.25**</td>
<td>0.01</td>
<td>−0.19**</td>
<td>−0.15*</td>
</tr>
</tbody>
</table>

*R&D, research and development; S.D., standard deviation.

*p < .05 (two-tailed)

**p < .01 (two-tailed)
esis testing. As our interaction model could have resulted in increased multi-collinearity, we zero-centered our variables to reduce this threat entering our analysis and obfuscating our results, as suggested by Aiken and West (1991) when using moderated regression. The presence of multi-collinearity within the moderation model was further diminished as the VIFs were all below 1.5.

As presented in Table 2, many of the control variables did influence firm innovativeness. As expected, R&D as a percentage of sales ($b = 0.31; p < .001$; one-tailed) and industry dynamism ($b = 0.30; p < .001$; one-tailed) had the largest impact, followed by firm age ($b = -0.12; p < .05$; one-tailed). We hypothesized a positive association between market orientation and firm

### Table 2

**Results of Moderated Regression Analysis ($n = 229$)**

<table>
<thead>
<tr>
<th>Variable/Step</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Controls</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Assets</td>
<td>0.11*</td>
<td>0.08</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>Firm Age</td>
<td>-0.19***</td>
<td>-0.12*</td>
<td>-0.12*</td>
<td>-0.12*</td>
</tr>
<tr>
<td>R&amp;D as a Percentage of Sales</td>
<td>0.40***</td>
<td>0.30***</td>
<td>0.30***</td>
<td>0.31***</td>
</tr>
<tr>
<td>Industry Dynamism</td>
<td>0.34***</td>
<td>0.30***</td>
<td>0.30***</td>
<td>0.30***</td>
</tr>
<tr>
<td><strong>Direct Effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Orientation</td>
<td>0.31***</td>
<td>0.31***</td>
<td>0.34***</td>
<td></td>
</tr>
<tr>
<td>Environmental Policy</td>
<td>0.10*</td>
<td>0.09*</td>
<td>0.09*</td>
<td></td>
</tr>
<tr>
<td>Organizational Life Cycle</td>
<td>-0.11*</td>
<td>-0.12*</td>
<td>-0.10*</td>
<td></td>
</tr>
<tr>
<td><strong>Lower Order Interactions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Orientation × Environmental Policy</td>
<td>-0.04</td>
<td>-0.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market orientation × Organizational Life Cycle</td>
<td>-0.04</td>
<td>-0.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Policy × Organizational Life Cycle</td>
<td>-0.05</td>
<td>-0.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Three-Way Interaction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Orientation × Environmental Policy × Organizational Life Cycle</td>
<td></td>
<td></td>
<td>0.11*</td>
<td></td>
</tr>
<tr>
<td><strong>R²</strong></td>
<td>0.380</td>
<td>0.503</td>
<td>0.508</td>
<td>0.518</td>
</tr>
<tr>
<td>R² (adjusted)</td>
<td>0.369</td>
<td>0.487</td>
<td>0.486</td>
<td>0.493</td>
</tr>
<tr>
<td>F-value</td>
<td>34.28***</td>
<td>31.96***</td>
<td>22.53***</td>
<td>21.19***</td>
</tr>
<tr>
<td>ΔR²</td>
<td>.121</td>
<td>0.005</td>
<td>0.010</td>
<td></td>
</tr>
<tr>
<td>Partial F (for ΔR²)</td>
<td>18.29***</td>
<td>0.77</td>
<td>4.30*</td>
<td></td>
</tr>
</tbody>
</table>

*aReported results are standardized regression coefficients.

*bAll variance inflated factors were less than 1.5.

*p < .05 (one-tailed)

**p < .01 (one-tailed)

***p < .001 (one-tailed)
innovativeness and found a significant relationship ($b = 0.34; p < .05$; one-tailed) resulting in support for H1. Similarly, we found environmental policy was positively associated with firm innovativeness ($b = 0.09; p < .05$; one-tailed), and a negative relationship between organizational life cycle and firm innovativeness did exist ($b = -0.10; p < .05$; one-tailed). As anticipated, we found that as a firm moved through the organizational life cycle, it became more rigid, and a negative relationship emerged as the organization became more mature.

For H2, we hypothesized moderating effects both through the environmental policy and organizational life cycle for the market orientation to firm innovativeness relationship. Specifically, we articulated that the association between market orientation and firm innovativeness (1) would be most positive when environment policy is high and organizational life cycle is early and (2) would be least positive when environment policy is low and organizational life cycle is in the later stages. To test this relationship, we created a three-way interaction term that included market orientation, environmental policy, and organizational life cycle. As seen in Table 2, preliminary support is found for this relationship. The interaction term was significantly associated with firm innovativeness ($b = 0.11; p < .05$; one-tailed). To interpret the interaction results for H2, we plotted the three-way interaction effect using the unstandardized regression coefficients (Jaccard and Turrisi 2003) and found that the different slopes were significantly different. Using the slopes difference tests as presented in Figure 2, we found significant differences for slope 2 (high environmental policy and early organizational life cycle) and slope 4 (low environmental policy and early organizational life cycle) ($t$-value $= -1.74; p < .10$; two-tailed), as well for slope 3 (low environmental policy and late life cycle) and slope 4 (low environmental policy and early life cycle) ($t$-value $= -1.71; p < .10$; two-tailed). These signifi-

Figure 2
Graph of Three-Way Interaction on Firm Innovativeness
cant differences indicate support for H2. In addition, the final regression equation for growth ventures had an $R^2$ of 0.518.

**Discussion and Implications**

In this study, we set out to examine the market orientation to firm innovativeness relationship through the incorporation of environment policy over the life cycle of the firm. Our results provide four identifiable contributions for SMEs: (1) the inclusion of a high strategic emphasis on the natural environment was positively related to the firm's entrepreneurial processes such as innovativeness; (2) SMEs are less innovative as they progress through the organizational life cycle; (3) a strong organizational environmental policy acts as a moderator and positively enhances the relationship between market orientation and innovativeness; and (4) SMEs in the later stages of the organizational life cycle will be less likely to integrate a rigorous strategic emphasis on the natural environment to the same extent as SMEs earlier in the organizational life cycle, which will preclude more mature ventures from being as innovative as their earlier stage peers. We are subsequently able to make the following observations.

H1 confirmed that an intentional focus of market orientation will result in increasing firm innovativeness in a positive way. As has been discussed elsewhere in the literature, SMEs that engage in strong market orientation will have entrepreneurial benefits, such as increased innovativeness, accrue to them as they are able to generate a more insightful perspective of their customers' needs and are then able to disseminate this knowledge throughout the organization. This capability, being intangible, increases the possibility of a sustainable competitive advantage.

From an environmental policy perspective, previous studies have looked more broadly and, typically, have investigated higher order CSR constructs (usually captured by a corporate social performance metric) and linked this to firm performance (usually a financial metric). Whether looking at short-term or long-term firm performance, extant studies linking CSR–financial performance have delivered mixed results (e.g., over the short term, Wright and Ferris (1997) found a negative relationship, Posnikoff (1997) found a positive relationship, and Teoh, Welch, and Wazzan (1999) found no relationship, whereas over the long term, Aupperle, Carrol, and Hatfield (1985) found no relationship, and Waddock and Graves (1997) found significant positive relationships). Reviewing these previous works, McWilliams and Siegel (2000) called for the inclusion of a firm-level R&D measure in any investigation that examined corporate social performance and firm financial performance claiming that many of the previous studies that omitted R&D (and additional industry factors) misrepresented the relationships. Although our study avoids firm financial performance and employs, rather, innovativeness as the dependent variable, we can claim extensions to this conversation. That natural environment focus in our study is positively linked to firm innovativeness that adds some credence to the importance of the relationships highlighted by McWilliams and Siegel.

In addition, our results shed further light on the importance for firms to develop a positive environmental strategy that will contribute to them building unique capabilities such as higher order learning and continuous innovation, as suggested in Sharma and Vredenburg (1998). Specifically, our findings highlight the importance of leveraging opportunities that are presented at the business/environment interface. An organization's communication with external parties about its attitude toward the environment may help build a posi-
tive image with stakeholders, that is, customers, investors, bankers, and suppliers (Fombrun and Shanley 1990), and this positioning may assist marketing strategy-related activities to maintain or to increase market share and be an identifiable point of differentiation (Porter and van der Lind 1995). Although the environment is a comparatively recent addition to the marketing strategy literature (see Menon and Menon 1997), Maignan, Ferrell, and Hult (1999) argued that firms’ market orientation is positively related to corporate citizenship proactivity, a notion our study supports.

Further, we suggest that managers with a market orientation may be acting with a focus toward the long term rather than the short term. Individuals in firms that create a market orientation embrace values that encourage individuals to act as a cohesive whole and to collaborate toward a common purpose in addressing the market (Gebhardt, Carpenter, and Sherry 2006). Managers in a market-driven and customer-oriented business are evaluated and rewarded differently than those in firms not positioned in this manner (Webster 1988). If managers are evaluated on the basis of short-term profitability and sales, they are more likely to focus on short-term criteria and neglect market factors that contribute to the long-term health of the organization (Jaworski and Kohli 1993). A majority of firms in our sample considered the natural environment to be of strategic importance.

Conversely, we found the slack resource argument to not be integral in a firm adopting environmental policies and increasing innovativeness, as total assets were not reported as a significant control variable, as reported in Table 2. Rather, we discovered that SMEs, which had moved further through the organizational life cycle, would be less likely to engage in entrepreneurial behaviors, such as innovativeness. The direct effect is negative between organizational life cycle and innovativeness. This finding would imply that as an SME gets to the later stages of the industry life cycle, then strategic rigidities set in and make the organization more mechanistic/bureaucratic along with the associated diminishing competitive behaviors associated with this state. These noncompetitive behaviors may include being slow to market, complacency, and/or strategic inertia to name a few. These behaviors become more manifested in the later stages of an organization’s life cycle.

An interesting premise of our study is the three-way interaction among market orientation and environmental policy and organizational life cycle. The findings provide evidence of support for H2, as we found that increasing a strategic emphasis on market orientation and environmental policy in organizations, which were at the earlier stages of their organizational life cycle, resulted in greater firm innovativeness. We also found innovativeness to be least positive when the firm has a low strategic emphasis on environmental policy and is at a late stage of the organizational life cycle. An interesting point was the nonfinding of significant differences of ventures that had a high emphasis on environmental policy and were in the later stages of the organizational life cycle compared with firms that had a low emphasis on environmental policy and were in the later organizational life cycle. Unfortunately, it does not bode well for ventures in the later stages to adapt to changes that call for an increasing emphasis on the environment, as the diminishing competitive behaviors associated with the late stages of the organizational life cycle seem to be too great to overcome.

Managerial Implications
Growing ventures are resource hungry, and resource access and allocation are a challenge for managers. As such, managers of early-stage ventures need to assure that they leverage their
commitment to the environment in an efficient manner. This parsimonious approach to resource allocation to natural environmental initiatives benefits them through increased innovativeness when used in association with a market-orientation strategy. What our results are alluding to, therefore, is that positive investments by managers of firms in the early phases of their life cycle in protection of the environment may pay dividends through increasing innovativeness. As such, the natural environment can be seen as a contributor to the firm’s long-term competitive advantage.

Limitations and Implications for Future Research

As with any empirical study, our limitations are for the most part based on our use of mail questionnaires to study SMEs, such as the use of single respondents. To help limit the potential effects associated with the competency of the single respondent, we only included respondents (i.e., owner or CEO) that we recognized to be actively engaged in the strategic processes of the SME.

In addition, our work was based on a single industry based in the United States in an attempt to control for industry context to limit potential confounding effects associated with the inclusion of multiple industries in one sample (e.g., Powell 1996). Thus, the findings of our study are only generalizable to SMEs in other industries and in nations that share common attributes associated with the food-processing industry and the United States.

Future research should build on these findings through inclusion of additional marketing variables such as the growing prominence of locavores, where increasing numbers of customers are demanding that their seasonal food products be sourced from local producers, as the distance to market is becoming increasingly noteworthy based on the resulting carbon footprint of transporting the food. Similarly, future researchers may wish to consider the location of SMEs within the value chain to aid in explaining the environmental policy of SMEs, as the strategic emphasis placed by the venture on the natural environment may possibly be, in part, a function of its position in the industry value chain.

Last of all, future studies should examine a broader range of industries to increase the overall generalizability of our findings. As proposed by Dobni and Luffman (2000), a market orientation may be more appropriate for some industries than others. Our findings suggest that the environmental policy does strengthen the market orientation to firm innovativeness relationship in early-stage ventures and is appropriate for the food-processing industry, which has a litany of governmental and non-governmental organizations monitoring it. These monitoring agencies may have required our respondents to be more cognizant of the environment than their counterparts in other industries where monitoring is more limited and noninvasive in nature.

Although it is clear that increasing market orientation is a positive development for firm innovativeness in this industry context, future work should explore more thoroughly how the policies of a firm related to the environment are embedded in an organization’s culture. Likewise, the strength of environmental policy and the resulting impact would be better measured through a longitudinal study of firms and in association with other strategies of the firms, such as branding or absorptive capacity. Scholars may also wish to study in greater depth what types of external and internal environmental loci have the greatest impact on a firm’s ability to employ a natural environmental strategy.

Other measures of market orientation should also be considered in future research. For this study, we chose the Narver and Slater’s (1990) market orien-
tation construct, as we focused on the cultural aspects of the firm. Kohli and Jaworski’s (1990) behavioral perspective would be of interest, along with other measures of market orientation such as the formative index of market orientation construct by Cadogan, Souchon, and Procter (2008). The results from these future studies can then be compared with the findings of this study to ascertain better which market orientation approach is the most effective for scholars and managers to utilize to understand better how different attitudes toward the environment affect the competitive nature of the firm.

**Conclusion**

In conclusion, early-stage ventures that place a strong emphasis on market orientation and protection of their environment will be more innovative than their competitors, which place a lesser emphasis on either of these two competitive strategies. This study supports the increased development and strength of these behaviors in engaging in entrepreneurial behaviors such as innovativeness.

**References**


