An Examination of How Supervisors Influence Their Subordinates to Engage in Environmental Behaviors

David E. Cantor†
Department of Supply Chain and Information Systems, College of Business, Iowa State University, 2340 Gerdin Business Building, Ames, IA 50011, e-mail: dcantor@iastate.edu

Paula C. Morrow
Department of Management, College of Business, Iowa State University, 3328 Gerdin Business Building, Ames, IA 50011, e-mail: pmorrow@iastate.edu

Jennifer Blackhurst
Department of Management Sciences, Tippie College of Business, University of Iowa, 21 East Market Street, Iowa City, Iowa, 52242, e-mail: jennifer-blackhurst@uiowa.edu

ABSTRACT

Employee engagement in environmental behaviors is an important topic in operations management. Drawing upon stakeholder, commitment, and organizational support theories, this study creates and tests an empirical model of how store managers (i.e., supervisors) influence their direct reports (i.e., subordinates) to become engaged in environmental behaviors. Based on a dataset derived from supervisors and their subordinates who are employed at the same grocery store location across a large retail grocery chain, we test our study’s nomological model and find support for the linkages proposed. Key research and managerial implications are discussed. [Submitted: March 4, 2013. Revised: March 4, 2014. Accepted: March 10, 2014.]

Subject Areas: Environmental Management, Environmental Behavior, Stakeholder Theory, Commitment Theory, Organizational Support Theory, and Supervisory Support.

INTRODUCTION

Organizational interest in motivating employees to engage in environmental behaviors has increased markedly in recent years (e.g., Ramus, 2001; Buysse & Verbeke, 2003; Wu & Pagell, 2011; Cantor, Morrow, & Montabon, 2012; Graves, Sarkis, & Zhu, 2013; Robertson & Barling, 2013). This interest is driven, in part, by the potential benefits of environmental behaviors such as reduced packaging waste,

†Corresponding author
decreased labor costs, and an improved reputation with organizational stakeholders (Carter & Rogers, 2008). Employee engagement in environmental behaviors can entail a variety of activities such as recycling, energy conservation, waste minimization, and the proposing of new eco-innovations, just to name a few. Both managerial and line-level employee attitudes toward engagement in environmental behaviors frequently influence the success or failure of a firm’s environmental initiatives (Dibrell, Craig, & Hansen, 2011). Research has shown that some firms may be compliance driven (meeting legal regulation requirements), while many firms are more proactive in nature (going beyond regulatory requirements) (Buysse & Verbeke, 2003). But in either case, challenges exist in making environmental practices a priority in firms including the motivating of employees to engage in environmental behaviors (Wu & Pagell, 2011). Consequently, environmental issues influence many organizational decisions as leaders seek to reconcile diverse points of view on environmental matters held by internal and external stakeholders (Mirvis, Googins, & Kinnicutt, 2010) and to balance the priorities of profit and environmental practice (Wu & Pagell, 2011).

There is a growing scholarly interest in examining the individual level factors that promote employee engagement in environmental behaviors. Graves et al. (2013), Robertson and Barling (2013), and Sarkis (2013) all assert that research focusing on employee participation in proenvironmental behavior is scarce and call for additional research to better understand proenvironmental behavior within the firm and specifically the proenvironmental behaviors of subordinates within the organization. Other researchers corroborate these assertions and call for research by stating that scant research has examined how supervisors’ viewpoints on environmental matters influence subordinates to engage in environmental behaviors and point out the strong influence that supervisors are known to have on subordinates’ attitudes and behaviors (Liden, Sparrowe, & Wayne, 1997; Stinglhamber & Vandenberghhe, 2003). Specific to the operations management discipline, recent work has begun to explore the rich area of understanding factors leading to environmental practice adoption at the individual level. For example, Cantor et al. (2012) present initial evidence that employee engagement in environmental behaviors can be enhanced by supervisory support and training but did not examine factors that influence a supervisor’s commitment to the environment and how supervisor commitment to the environment influences the commitment of subordinate employees to engage in environmental behaviors. Gattiker and Carter (2010) and Wu and Pagell (2011) both discuss how employee behaviors are a significant component of successful environmental practice initiatives. Klassen (2001) examines how a plant manager’s personal orientation affects the plant’s environmental management orientation and performance. Similarly, Pagell and Gobeli (2009) investigate how an operations manager’s attitude toward environmental issues impacts environmental performance. Buysse and Verbeke (2003) discuss how employees are a critical resource to the successful adoption of environmental practices.

While the above-mentioned studies have made important contributions to the operations management literature, there is an opportunity to further develop theoretical and empirical insights into how supervisors induce their subordinates to engage in environmental behaviors. A steady stream of research points out that employee engagement in environmental behaviors is difficult to achieve
Table 1: Differences in environmental and traditional work behaviors.

<table>
<thead>
<tr>
<th>Environmental Behaviors</th>
<th>Traditional Work Behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voluntary</td>
<td>Mandated</td>
</tr>
<tr>
<td>Not written into job descriptions</td>
<td>Written into job descriptions</td>
</tr>
<tr>
<td>Environmental behaviors are not routinely tracked</td>
<td>Conventional work behaviors are routinely measured</td>
</tr>
<tr>
<td>Not formally rewarded (or punished) in many organizations</td>
<td>Formal reward and disciplinary mechanisms in place</td>
</tr>
<tr>
<td>Likely to be affected by personal environmental beliefs</td>
<td>Less likely to be affected by personal environmental values and beliefs</td>
</tr>
</tbody>
</table>

unless the firm transforms its business practices to support such behaviors (Carter & Dresner, 2001; Gattiker & Carter, 2010), which are typically voluntary in nature, as is the case in our study. Boiral (2009) makes a strong case regarding how the implementation of environmental management systems and suggestions for improvements depend on employees’ willingness to voluntarily participate in environmental activities. Moreover, organizations face a daunting challenge of directly involving individual employees in environmental activities (Sarkis, Gonzalez-Torre, & Adenso-Diaz, 2010). Not surprisingly, there is scholarly and practitioner interest in developing a better understanding of how to foster employee commitment to the environment and to involve mid- and lower-level employees in activities supportive of the natural environment.

Promoting employee commitment to environmental practices is a challenging endeavor. Unlike other organizational initiatives such as safety, quality, and more recently, information technology (IT) security (Hu, Dinev, Hart, & Cooke, 2012), environmental practices are seldom required or mandated by the organization or even the government (Buysse & Verbeke, 2003). When instituted, they are more reflective of the values of the organization and/or employee. Stated differently, unlike safety and quality work behaviors, environmental work behaviors are elective and are not a job requirement (Ramus & Killmer, 2007). As such, they represent extra-role behaviors, behaviors that are defined as discretionary, of benefit to an organization, and that go beyond existing role expectations (Van Dyne, Cummings, & Mclean Parks, 1995). Table 1 highlights how employee engagement in environmental behavior is distinct from other managerial practices aimed at influencing more conventional employee work behaviors. Perhaps, the biggest distinction is the voluntary nature of employee engagement in environmental activities. Employee engagement in environmental behaviors is not a mandated behavior in many organizations (including the one in this study). Because environmental behaviors are seldom specified in job descriptions (at least at present), it is difficult for managers to mandate that their employees engage in environmental behaviors. Employee environmental behaviors are not routinely monitored with the same precision as conventional employee behaviors. As a result, it is difficult for firms to put into place positive (e.g., bonuses) or negative (e.g., discipline) incentives for these behaviors. Employees may also hold personal values concerning the environment that carry over to affect their work-related environmental behaviors (Graves et al., 2013). Relatedly, many organizations simply assume that
having environmental policies, reporting procedures, and mission statements are sufficient to assure that employees will engage in environmental-friendly behavior (Haugh & Talwar, 2010). However, Linnenluecke, Russell, and Griffiths (2009) explicitly examined employee awareness and understanding of corporate sustainability practices within a single organization and observed significant variation by organizational subculture, suggesting that employees exhibit wide differences in understanding what the organization expects relative to environmental behaviors. For these reasons, we believe that a clearer understanding of how to affect discretionary behavior, like employee environmental behavior, is needed. We explore the role of the supervisor in this regard. Therefore, this research seeks to identify whether supervisory commitment to the environment is attended by employees and, if so, whether it affects their commitment and subsequent behavior.

This study utilizes stakeholder theory, commitment theory, and organizational support theory (OST) to seek answers to the following questions in our supervisor-subordinate study: *What are factors that affect a supervisor’s commitment to the environment?* *How does a supervisor’s commitment to the environment influence a subordinate’s engagement in environmental behaviors?* Our study extrapolates from stakeholder theory (Freeman, 1984) to suggest that pressures from customers, regulators, and corporate managers influence a supervisor’s commitment to the environment and then, in turn, influence employee environmental behaviors. We also draw from commitment theory (Meyer, Becker, & Vandenberghe, 2004) to explain how subordinates’ emotional attachment to the environment influences perceptions and behaviors. OST (Eisenberger, Huntington, Hutchinson, & Sowa, 1986; Eisenberger & Stinglhamber, 2011) is used to examine the supervisor’s role in promoting subordinate engagement in environmental behaviors. We leverage OST to better understand how supervisors signal their commitment to the environment to their employees.

The design of our study is based on supervisors and their subordinates (i.e., department managers) who are employed at the same grocery store location so that we are able to capture insights from both the supervisor and their respective subordinate related to environmental behaviors. This research design allows us to examine our research questions from two vantage points within the organization. In doing so, our study builds upon prior organizational support research in the context of environmental management (e.g., Ramus & Steger, 2000; Gattiker & Carter, 2010; Sarkis et al., 2010; Cantor et al., 2012).

**THEORETICAL BACKGROUND**

**Stakeholder Theory**

Stakeholder theory serves as the first theoretical framework of this study. Stakeholder theory is traditionally used to explain the process through which managers consider the interests of stakeholder groups who can affect (or be affected by) the company’s activity (Freeman, 1984; Phillips, Freeman, & Wicks, 2003; Sarkis et al., 2010). Stakeholders include not only shareholders but also any other group related to the business such as investors, supervisors, employees, customers, and suppliers (Clarkson, 1995). While other definitions of stakeholders exist (Donaldson & Preston, 1995; Phillips et al., 2003), supervisors clearly fit Freeman’s (1984,
p. 46) definition of “any group or individual who can affect or is affected by the achievement of the organization’s objectives.” Stakeholder theory is appropriate in this study because our data are derived from supervisors and their subordinates who are influenced by the interests of corporate stakeholders. It should be noted that the role of supervisors (managers) in the stakeholder framework is not well established (Donaldson & Preston, 1995). Aoki (1984), for example, views supervisors as “referees” between investors and employees, suggesting that they are the personification of the organization. However, supervisors have their own interests to advance as well. Indeed, Williamson (1985) notes that supervisors are a powerful constituency and are likely to engage in opportunistic and self-promoting behaviors. This is especially true in this research setting as the supervisors in question are not only responsible to top management but are also stakeholders in their own right who have a financial interest in their store’s performance (i.e., stores are profit centers with store manager compensation linked to store performance). We suggest, perhaps for the first time, that we can draw from stakeholder theory to better understand the relationship of how supervisors influence their subordinates to engage in environmental behavior.

Extrapolating from stakeholder theory, store managers (like firms) should take into account the environmental interests of various stakeholder groups to engage in environmental behaviors (Freeman, 1984; Phillips et al., 2003; Sarkis et al., 2010). Just as firms are influenced by stakeholders to engage in certain activities, store managers should similarly respond to the interests of their stakeholders. Here, we focus on how stakeholders (e.g., corporate managers, customers, and regulators) communicate their environmental desires to store managers in the environmental realm. These stakeholders may be supportive or nonsupportive of the adoption of environmental practices (Sarkis et al., 2010). We assert that the commitment of the supervisors/store managers in this study is affected by the environmental desires of these stakeholders. Based on this argument, we selected three environmentally-relevant factors that facilitate the development of an emotional bond of the supervisor to environmental causes (i.e., influences supervisory commitment to the environment): organizational promotion of environmental practices, environmental demands of stakeholders, and the extent to which environmental and revenue organizational goals are perceived to conflict with one another.

**Commitment Theory**

Next, in order to enhance our understanding of how stakeholder demands influence supervisors and their subordinates to become more committed to environmental behaviors, insights from commitment theory are integrated into this study. While commitment theory is a mature explanatory framework within organizational behavior research, Morrow (2011) notes that there remains a need for greater specification of the antecedents of commitment. While originating in the context of organizational commitment, commitment theory has evolved to explain commitment to additional targets including other organizational affiliations (e.g., professions, unions), individuals within and outside of organizations (e.g., suppliers, customers), as well as ideas and initiatives (values, goals, and change programs) (Becker, Klein, & Meyer, 2009). In essence, commitment theory examines how individuals come to identify with a target and the consequences of
that identification (Meyer & Herscovitch, 2001). Typically, commitment manifests itself in employee desires to act in ways supportive of a target’s goals and interests. For example, there is considerable research documenting that employees who are committed to organizational goals contribute to organizational success (Klein, Molloy, & Cooper, 2009).

We integrate commitment theory into our study to explain how supervisors and employees develop a commitment to the environment and thereby advance an organization’s sustainability goals. As indicated, commitment targets can be wide ranging and include socially responsible causes such as concern for the environment (Bingham, Mitchell, Bishop, & Allen, 2013). Specifically, we pinpoint commitment to the environment as our target and use of commitment theory, as did Cantor et al. (2012) and Gattiker and Carter (2010), to better understand how supervisors and subordinates develop a sense of commitment to the environment and the consequences of such commitment.

Commitment theory research has demonstrated that this bond binds the individual to the cause and sustains his or her behavioral support for it (Klein et al., 2009). In other words, the emotional grounding of affective commitment explains why individuals want to engage in environmental activities and why the successful implementation of environmental practices has been shown to require employee acceptance and voluntary participation (e.g., Ramus, 2001; Fernández, Junquera, & Ordiz, 2003; Boiral, 2009). This theoretical lens is important in our study because employee engagement in environmental behaviors is a discretionary workplace behavior.

In this study, we focus on the antecedents of affective supervisory commitment to the environment (Morrow, 2011). Commitment researchers have only recently begun to consider the effects of supervisory commitment to a target on subordinates’ commitment to that same target (e.g., Loi, Lai, & Lam, 2012). We investigate how supervisory commitment to the environment (as reported by supervisors) comes to affect subordinate commitment to the environment (as reported by subordinates).

Supervisors who possess strong affective commitment toward a target (e.g., the environment) will initiate behaviors that go above and beyond their assigned responsibilities (Vandenberghe, 2009). In their interactions with subordinates, supervisors are more likely to direct subordinate attention to target-related goals and values (Meyer et al., 2004). Supervisors with high levels of commitment are likely to also display more positive emotions toward the target which subordinates may consciously or unconsciously mimic, even though the subordinate is not obligated to do so because engaging in environmental behavior is not stipulated in the subordinate’s job duties and responsibilities (Barsade, 2002). Loi et al. (2012) empirically examined the effects of supervisors’ organizational commitment and found it to be positively related to subordinates’ organizational commitment and their subsequent extra-role and task performance.

We integrate commitment theory into our model as follows. First, we consider supervisory commitment to the environment as an outcome of external stakeholder demands related to environmental practices placed on the supervisor. Next, we posit supervisory commitment as an antecedent of subordinates’ perceptions of their supervisors’ support of the environment. This examination of supervisory
commitment as a predictor of subordinate perception of supervisory support, to our knowledge, has yet to be empirically evaluated. Finally, we consider how these perceptions held by subordinates affect the subordinates’ commitment to the environment, and ultimately their engagement in environmental behaviors.

**OST**

OST is used to examine the relationship between employee attitudes and behaviors aimed at meeting an organization’s goals (Eisenberger et al., 1986; Rhoades & Eisenberger, 2002; Aselage & Eisenberger, 2003; Eisenberger & Stinglhamber, 2011), including employee engagement in environmental practices. Cantor et al. (2012) used OST to explain how perceptions of an organization’s environmental practices (i.e., supervisory support and training) can promote employee commitment to environmental behaviors, a discretionary behavior in the study. The present study draws from this theorizing and further extends OST by focusing more attention on the supervisor’s role in promoting subordinate engagement in environmental behaviors.

The OST literature has examined the role of the supervisor primarily through a construct known as “perceived supervisory support (PSS).” PSS refers to the degree to which employees believe that their supervisors value their contributions, care about their well-being, and show supportive behaviors toward them (Eisenberger, Stinglhamber, Vandenberghe, Sucharski, & Rhoades, 2002). In the context of this study, PSS of the environment can be defined as the extent to which an employee believes that his or her supervisor cares about environmental issues and provides the resources needed to engage in workplace environmental activities. This is an important construct for several reasons. Supervisors are influential determinants of employee perceptions, attitudes, and behaviors (Eisenberger & Stinglhamber, 2011) and, more specifically, provide direction regarding how employees should allocate their time. This is an important point in this study because environmental behaviors are not stipulated in the employee’s job descriptions. Previous studies have also shown that supervisors are critical enablers of subordinate risk taking, idea generation, innovation, creativity, and experimentation on the job (Kimberly & Evanisko, 1981; Ramus & Steger, 2000), behaviors consistent with adopting new environmental initiatives. Consequently, supervisors have the opportunity to engage in behaviors to encourage or discourage environmental activities via their role modeling, communication of organizational expectations, recognition behavior, etc. Stated differently, because supervisors are actively involved with employees in developing a shared vision and developing consensus for organizational practices (Beer, Eisenstat, & Spector, 1990), employees are attentive to the words and actions of immediate supervisors and thus are more likely to engage in environmental behaviors even though such work behavior is not mandated (Larkin & Larkin, 1996). Supervisors are thus well positioned to influence subordinate commitment and behavior. Unfortunately, the role of the supervisor in promoting environmental activities has rarely been examined empirically and our study seeks to investigate whether supervisors can serve to promote employee environmental involvement. In this study, subordinate perception of supervisory support of
the environment is postulated to hold a central role in employee engagement in environmental behaviors. Our conceptual framework is shown in Figure 1.

**HYPOTHESIS DEVELOPMENT**

**Organizational Promotion of Environmental Practices**

The first stakeholder pressure that a supervisor perceives is the organization’s promotion of environmental practices. Top management and senior leadership act in ways that communicate their level of support for environmental behaviors (Zhu, Sarkis, Cordeiro, & Lai, 2008; Sarkis et al., 2010). High levels of support are demonstrated by headquarter-level engagement in activities to promote the environment (e.g., funding environmental initiatives, setting environmental goals). Such promotions, in turn, convey top management’s desires with respect to environmental efforts. In other words, supervisors (e.g., store managers) are the recipients of the organization’s message regarding environmental activities (Hanna, Newman, & Johnson, 2000; Daily & Huang, 2001) and as supervisors, they are in a unique position to support (or not support) environmental behaviors among their employees. Consequently, the extent to which a supervisor perceives that his or her organization promotes environmental practices, the more he or she is likely to be committed to the environment. Several studies have demonstrated that when organizations convince employees of their support for a given initiative, program, or cause (e.g., the environment), employees demonstrate higher levels of voluntary commitment to the target (Grant, Dutton, & Rosso, 2008; Hu et al., 2012; Bingham et al., 2013). To elaborate, when organizations convey their support for the environment by providing training, recognition programs, environmental investments, etc., the organization communicates organizational desires, and that store-level engagement in environmental activities would be well received.
Employees, including supervisors, attend to these messages and consequently elevate their commitment to the environment. Consequently, we hypothesize:

**Hypothesis 1.** *Organizational promotion of environmental practices is positively related to supervisory commitment to the environment.*

**Stakeholders and Environmental Practices**

The second stakeholder pressure arises from external stakeholder groups. We contend that when supervisors perceive that external stakeholder groups favor environmental practices, the supervisor’s commitment will be enhanced. We base this assertion on recent research illustrating that external stakeholders can influence firms to consider environmental practices (e.g., Sarkis et al., 2010). Stakeholders may be appreciative of firms that provide resources to support environmental practices (Freeman, 1984; Buysse & Verbeke, 2003; Sarkis et al., 2010). Thus, supervisors must balance the interests of external stakeholder demands against other revenue generating projects into their decisions to become more environmentally committed (Phillips et al., 2003; Wu & Pagell, 2011). While recent studies have examined stakeholder influence on issues related to environmental practices at the firm level of analysis (e.g., Sarkis et al., 2010; Wu & Pagell, 2011) and have discussed how environmental practices are enhanced by either collaboration with or meeting demands from external stakeholders (Zhu & Sarkis, 2007; Harrison, Bosse, & Phillips, 2010), scant research has examined how stakeholders influence individual-level attitudes and behaviors such as those of a supervisor. If a supervisor believes that accommodating external stakeholders’ (e.g., customers, government officials) environmental preferences will result in favorable outcomes (e.g., increased sales, fewer inspections), then the supervisor will demonstrate a higher level of commitment to environmental practices. Accordingly, we hypothesize:

**Hypothesis 2.** *Demands from external stakeholder groups to engage in environmental practices are positively related to supervisory commitment to the environment.*

**Trade-Offs between Environmental and Revenue Goals**

A third stakeholder pressure, whether environmental and revenue-related organizational goals are thought to be in conflict, is an important consideration for supervisors who are accountable for financial outcomes of their units. Donaldson and Preston (1995) point out that the manager must take into account the financial performance of the firm. Thus, managers should recognize that the achievement of sales goals could come at the expense of environmental goals. Such situations could diminish a store manager’s pursuit of environmental activities. Moreover, research in the area of environmental practices highlights the fact that competing trade-offs can arise across strategic initiatives and managing these trade-offs is a challenge for many organizations. For example, Wu and Pagell (2011) discuss examples where not all waste reduction activities are positively associated with improved environmental performance. A specific example from the automobile industry is cited where the use of spray paints improved quality (and lowered costs) but the impact to the environment was damaging. Barriers to implementing environmental practices included perceptions that these implementations were
time-consuming and expensive. Mollenkopf, Stolze, Tate, and Uelschy (2010) found another impediment to be a general lack of awareness of the benefits of environmental practices. In fact, empirical data illustrated that perceptions of these practices do not necessarily provide a strategic advantage to the firm and that they may actually erode a firm’s competitiveness. The lack of clear metrics for environmental practices was cited as an issue. Therefore, the trade-offs between environmental practices and traditional revenue metrics present a potential conflict for supervisors. In fact, Parmigiani, Klassen, and Russo (2011, p. 220) state that firms “trying to augment a historical emphasis on economic outcomes” may encounter difficulties in implementing environmental performance outcomes. This is echoed in Wu and Pagell (2011) who discuss how not all environmental practices will yield cost savings and some environmental initiatives may actually represent a financial burden to the firm. Stated differently, perceptions of a trade-off between achieving environmental and revenue goals are not likely to lead supervisors to elevate their commitment to the environment. Consequently, we hypothesize:

**Hypothesis 3.** Perceived trade-offs between realizing environmental and revenue goals are negatively related to supervisory commitment to the environment.

### Consequences of Supervisory Commitment to the Environment

We enhance our understanding of how a supervisor’s commitment to the environment affects a subordinate’s perceptions of supervisory support of the environment (i.e., PSS) by drawing from OST. As OST attests, supervisors who are committed to environmental practices are likely to signal their commitment to subordinates through a variety of mechanisms (e.g., assigning tasks, allocating resources, role modeling, communicating expectations and goals, and rewarding behaviors) and thereby increase subordinates’ awareness of the supervisor’s commitment to environmental activities. Supervisors can offer environmental training and workshops, make eco-renovations to the workplace, visibly engage in proenvironmental behaviors like recycling, etc. Supervisory commitment may also influence subordinate perceptions via mimicry effects as suggested by commitment theory and shown by Loi et al. (2012).

Ramus and Steger (2000) studied the effects of subordinate ratings of supervisory behaviors on subordinate promotion of environmental initiatives. They found that supervisors who were supportive of environmental behaviors (promotion of innovation, open communication, information sharing, and employee recognition) had subordinates who were more likely to try to promote environmental initiatives. We contend, however, that subordinate commitment is not an immediate result of supervisory commitment to the environment, but rather, first depends on subordinate perceptions of their supervisors’ support for the environment. In other words, Ramus and Steger (2000) omitted an important mediating factor by not including subordinates’ assessments of their supervisors’ support of the environment (i.e., subordinate perception of supervisory support of the environment[PSS]). This perception then has subsequent consequences for subordinate commitment and behavior, as detailed in hypotheses 5 and 6.

The influence of supervisors’ environmental commitment on subordinate perceptions of the supervisors’ support for the environment is bolstered by Robertson
and Barling’s (2013) work. They examined supervisors’ environmentally-specific leadership behaviors and verified that they were highly correlated with subordinate ratings of those same behaviors; that is, supervisor self-reports and subordinate perceptions of supervisors’ environmental behaviors were in agreement. Consequently, we expect that supervisors who are highly committed to the environment will elicit strong perceptions of supervisory support for the environment among their subordinates. These findings are supportive of the notion that supervisory commitment to the environment, manifested through proenvironmental signals, is predictive of PSS (subordinate perception of supervisory support of the environment). Our hypothesis thus stipulates:

**Hypothesis 4. Supervisory commitment to the environment is positively related to subordinate perception of supervisory support of the environment (PSS).**

We now turn to describing how subordinate PSS affects subordinate commitment to the environment that, in turn, results in subordinate engagement in environmental behaviors. Perceived support from various sources (supervisors and organizations) has been shown to enhance commitment (Rhoades & Eisenberger, 2002; Riggle, Edmonson, & Hansen, 2009). Moreover, Ng and Sorensen (2008) report meta-analytic evidence of a strong, positive relationship between our specific form of support, PSS, and affective organizational commitment. We extrapolate from this line of theorizing to suggest that supervisory support of the environment stimulates a higher level of environmental commitment among a supervisor’s direct reports. Bingham et al. (2013) provide an analogous case example of how employee commitment to an organization-sponsored cause, the 2010 Gulf Oil Spill, was enhanced by involvement of social referents (e.g., supervisors). In the environmental context, Cantor et al. (2012) found that distribution center employees who perceived high levels of organizational support for the environment exhibited higher levels of commitment to the environment. As described above, Robertson and Barling (2013) used leader environmental behaviors, which were demonstrated to be highly correlated with subordinate ratings of those same behaviors and therefore similar to PSS, to predict subordinate environmental commitment. We therefore offer the following hypothesis:

**Hypothesis 5. Subordinate perception of supervisory support of the environment (PSS) is positively related to subordinate commitment to the environment.**

We now focus on the last linkage in our model that is the connection between subordinate commitment to the environment and subordinate engagement in environmental behaviors. Commitment theory stipulates that commitment (an attitude) is predictive of employee behavior. Documentation of this relationship in the commitment domain is provided by research summaries demonstrating a link between affective organizational commitment and a diverse range of employee behaviors including task performance, turnover intentions, and organizational citizenship behaviors (Meyer, Stanley, Herscovitch, & Topolnytsky, 2002; Cooper-Hakim & Viswesvaran, 2005). Commitments to other targets, such as membership drives, also demonstrate behavioral consequences (e.g., completing more recruiting calls as in Neubert & Cady, 2001). Stated differently, high levels of commitment propel individuals to exhibit behavioral support for causes. Robertson and Barling (2013)
found that subordinates’ commitment to the environment (termed as harmonious environmental passion) predicted their environmental behaviors. Based on this literature, we hypothesize that subordinate commitment to the environment will be predictive of subordinate engagement in environmental behaviors.

**Hypothesis 6. Subordinate commitment to the environment is positively related to subordinate engagement in environmental behaviors.**

**METHODOLOGY**

**Survey Development**

Survey research on environmental topics in the operations management discipline has been dominated by a nearly exclusive focus on one key informant per organization. To address this limitation, we deliberately designed our survey and sample selection process so that we can examine the relationships of supervisors and their subordinates (i.e., department managers) who are employed at the same grocery store location. Our unit of analysis consists of the supervisor and their corresponding subordinates.

We administered two different surveys to examine how perceptions of organizational factors by store managers (i.e., supervisors) influence departmental managers (i.e., subordinates) to engage in environmental behaviors (i.e., a supervisor survey and a subordinate survey). The surveys were linked by store number in order to ensure that the supervisor’s responses were associated with the subordinate’s responses. The supervisor survey queried supervisors on their perceptions of three types of pressures and their own commitment to the environment. The subordinate survey asked the supervisor’s corresponding departmental managers about their perceptions of their supervisors’ support of the environment, their own commitment to the environment, and their own engagement in environmental behaviors. These two survey data sources are indicated in Figure 1.

**Survey Administration**

Since the purpose of this research is to determine how supervisors’ perceptions of organizational factors and their commitment to the environment influence subordinate engagement in environmental behaviors, the supervisor and their corresponding subordinate linked data are the appropriate unit of analysis. Examining supervisor—subordinate-linked data also mitigate potential common method bias concerns because our data collection strategy involves obtaining data from several key informants across the firm’s retail locations (i.e., supervisor- and subordinate-linked survey responses). In addition, because the focus of this research is on testing the proposed linkages articulated by our supervisor–subordinate model, it is unnecessary to control for organizational effects that would be evident in a multiorganization study. While a sample from a single organization is just beginning to be used in the operations management literature to address research questions pertaining to individual employees (e.g., Brown, Willis, & Prussia, 2000; Murtha, Challagalla, & Kohli, 2011; Cantor et al., 2012), collecting data from a single organization is commonplace in the management and psychology literatures.
Accordingly, we selected a large grocery chain located in the mid-west of the United States that is starting to place a value on environmental management activities to administer our surveys to a sample of the supervisors and their respective subordinates. At the time of the study, this organization did not mandate environmental commitment or environmental behaviors among its retail employees. The organization communicated the legitimacy of our university-connected surveys to the potential respondents. The corporate sponsor prenotified their employees about the importance of completing the surveys in order to improve the response rates to our survey.

Sample
The sample consists of supervisors (store managers) and their respective subordinates (departmental managers) who are employed at the same retail location across a large grocery retail chain. The sponsor is a privately held organization that operates 235 retail stores across eight states in the mid-west region of the United States and has over $7 billion in annual sales. Our sponsor provided advanced notification about the surveys and e-mailed a link to the online questionnaire to the potential respondents. Usable survey responses from 162 supervisors were received. Surveys were completed during regular work hours, an accommodation that facilitated the 68.9% response rate. The average supervisor respondent was 44.24 years of age (standard deviation = 6.81) and 90% of the supervisor sample was composed of males. The average respondent had 8.94 years of experience working as a supervisor at their current store location (standard deviation = 6.36).

The subordinate version of the survey was distributed to the supervisors’ respective subordinates (department managers) who directly report to the supervisors at the 162 stores (N = 486). We received 268 subordinate survey responses that could be linked to the completed supervisor surveys, resulting in a response rate of 61.60%. Subordinates held responsibilities in one of three areas: grocery/center store (41%), perishables (34%), and general merchandise (25%). The average subordinate was 36.45 years of age (standard deviation = 8.68) and 82% of the subordinate sample was composed of males. The average respondent had 6.58 years of work experience as a subordinate at their current store location (standard deviation = 5.87). Our final sample consists of an average of 1.97 subordinates per supervisor.

Measurement of Variables
We now turn to describing the scale items that are contained in our surveys. The survey items are provided in Appendix A. Our dependent variable, subordinate engagement in environmental behaviors, is measured by using five scale items from Montabon, Sroufe, and Narasimhan (2007) modified to examine individual engagement in environmental behaviors using a “1 = Never” to “7 = Frequently” set of response options.

The independent variables consisted of three factors thought to influence supervisory commitment to the environment. The first, organizational promotion of environmental practices, based on Gattiker and Carter (2010), was measured using a seven-point response format (i.e., 1 = Strongly disagree, 7 = Strongly
agree). Our second independent variable focused on supervisory perceptions of stakeholder pressures was based on Sarkis et al. (2010) and used a “1 = Not at all” to “7 = Strong pressure” set of response options. Finally, our third independent variable, supervisory perception of environmental/revenue trade-offs, was based on Das, Pagell, Behm, and Veltri (2008) and used a “1 = Strongly agree” to “5 = Strongly disagree” set of response options.

All of the remaining measures relied on a 1 = Strongly disagree to 7 = Strongly agree set of response options. Supervisor commitment to the environment is based on a modified version of Mowday, Steers, and Porter’s (1979) measure of organizational commitment. We measured perceived supervisor support for the environment (PSS) by modifying Eisenberger et al.’s (1986) measure of perceived organizational support. We measured subordinate commitment to the environment based on items from Mowday, Steers, and Porter’s (1979) measure of organizational commitment. We also gathered data on several control variables. We measured a subordinate’s personal commitment to the natural environment using a measure formulated by Davis, Le, and Coy (2011). We also measured the subordinate’s age, gender, and years of experience at the current store to use as control variables. Age and store tenure were measured as metric variables, while a dummy variable (1 = male, 0 = female) was used to capture gender. A summary of the variables along with descriptive statistics is found in Table 2.

Because there is the potential for common method bias, we explicitly took several steps in our research design including data from several key informants per store location (e.g., supervisor and subordinate employees) along with instrument design and validation. First, the source of our data is both store managers and their respective subordinate employees. Next, following Podsakoff, MacKenzie, Lee, and Podsakoff (2003) and Song and Zahedi (2005), we deliberately incorporated into our survey a mixture of response formats, neutral words, multiple items for each factor, and reverse coded questions to minimize common method variance. Employing a mixture of response formats forces the respondent to carefully read the questionnaire. Following Podsakoff et al. (2003), we conducted an exploratory factor analysis of both the supervisor and subordinate variables to determine whether the majority of the variance can be accounted for by one general factor. This test showed that the first factor in the supervisor part of the model accounted for 20.20% of variance and the first factor in the subordinate part of the model accounted for 28.6% of variance. We also added a single factor to our measurement model and found that our structural model results are consistent to the original results ($\chi^2 = 587.752/df = 313 = 1.862$, RMSEA = 0.057, CFI = .931, IFI = .933). Based on these tests, we conclude that common method bias is not a serious concern.

RESULTS

Confirmatory Factor Analysis (CFA)

CFA is used to assess the validity and adequacy of the factor structure pertaining to the measurement model. The CFA results suggest a high level of accuracy associated with the latent variables. As shown in Appendix A, the fit indices for the
Table 2: Descriptive statistics and correlation matrix.

<table>
<thead>
<tr>
<th>Std. Mean Deviation</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Organizational promotion</td>
<td>5.720</td>
<td>1.090</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Stakeholder demands</td>
<td>4.050</td>
<td>1.280</td>
<td><strong>0.239</strong></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Environmental/revenue trade-off</td>
<td>2.080</td>
<td>0.690</td>
<td>−0.047</td>
<td>−0.050</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Supervisor environmental commitment</td>
<td>5.230</td>
<td>0.930</td>
<td><strong>0.283</strong></td>
<td><strong>0.427</strong></td>
<td>−0.267</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5. Perception of supervisory support of environmental behaviors</td>
<td>5.740</td>
<td>0.920</td>
<td>0.001</td>
<td>−0.030</td>
<td>−0.014</td>
<td><strong>0.144</strong></td>
<td>1</td>
</tr>
<tr>
<td>6. Subordinate environmental commitment</td>
<td>5.250</td>
<td>1.090</td>
<td>−0.026</td>
<td>−0.035</td>
<td>0.019</td>
<td>0.053</td>
<td><strong>0.421</strong></td>
</tr>
<tr>
<td>7. Subordinate engagement in environmental behaviors</td>
<td>5.360</td>
<td>1.160</td>
<td>0.041</td>
<td>0.007</td>
<td>0.005</td>
<td>0.082</td>
<td><strong>0.519</strong></td>
</tr>
<tr>
<td>8. Subordinate’s personal commitment to the natural environment</td>
<td>5.780</td>
<td>0.810</td>
<td>0.062</td>
<td>0.010</td>
<td>−0.055</td>
<td>−0.040</td>
<td><strong>0.252</strong></td>
</tr>
</tbody>
</table>

Correlation coefficients significant at \( p < .01 \) level are in bold.

Overall measurement model and for each latent variable suggest the CFA accurately reflected the underlying variance–covariance structure tying the indicator variables according to the criteria by Hu and Bentler (1999). All items have a standardized loading > .5 and are statistically significant (\( p < .01 \)). Moreover, none of the standardized residuals is above or below \( +2.0 \). Confirmatory validity is further evaluated by examining the average variance extracted (AVE). Fornell and Larcker (1981) recommend an average extracted variance higher than 0.50. As shown in Appendix B, all of the AVE values meet the minimum required value. Fornell and Larcker (1981) suggest that discriminant validity is established if the AVE for each construct exceeds the squared correlation between the constructs, which is demonstrated in Table 3. All construct reliability estimates are greater than 0.70 which suggests good reliability (see Appendix B). Overall, the measurement model fit was strong (\( \chi^2 = 608.921/df = 349 = 1.745, \ RMSEA = 0.053, \ CFI = .943, \ IFI = .944 \)). Therefore, the CFA results provide evidence of discriminant validity, convergent validity, and unidimensionality (Anderson & Gerbing, 1988).
Table 3: Discriminant validity test.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Organizational promotion</td>
<td>0.68</td>
<td>0.06</td>
<td>0.00</td>
<td>0.08</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>2. Stakeholder demand</td>
<td>0.24</td>
<td>0.55</td>
<td>0.30</td>
<td>0.18</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>3. Environmental/revenue trade-off</td>
<td>−0.05</td>
<td>−0.05</td>
<td>0.69</td>
<td>0.07</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>4. Supervisor environmental commitment</td>
<td>0.28</td>
<td>0.43</td>
<td>−0.27</td>
<td>0.58</td>
<td>0.02</td>
<td>0.00</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>5. Perception of supervisory support of environmental behaviors</td>
<td>0.00</td>
<td>−0.03</td>
<td>−0.01</td>
<td>0.14</td>
<td>0.81</td>
<td>0.18</td>
<td>0.27</td>
<td>0.06</td>
</tr>
<tr>
<td>6. Subordinate environmental commitment</td>
<td>−0.03</td>
<td>−0.04</td>
<td>0.02</td>
<td>0.05</td>
<td>0.42</td>
<td>0.69</td>
<td>0.19</td>
<td>0.14</td>
</tr>
<tr>
<td>7. Subordinate engagement in environmental behaviors</td>
<td>0.04</td>
<td>0.01</td>
<td>0.01</td>
<td>0.08</td>
<td>0.52</td>
<td>0.44</td>
<td>0.59</td>
<td>0.07</td>
</tr>
<tr>
<td>8. Subordinate’s personal commitment to the natural environment</td>
<td>0.06</td>
<td>0.01</td>
<td>−0.06</td>
<td>−0.04</td>
<td>0.25</td>
<td>0.37</td>
<td>0.27</td>
<td>0.70</td>
</tr>
</tbody>
</table>

Note: Diagonal entries (in italics) are average variances extracted, entries below the diagonal are correlations, and the entries above the diagonal represent the squared correlations. Correlation coefficients significant at \( p < .01 \) level are in bold.

Structural Model Analysis

Because our model has a nested structured of supervisors and subordinates, hierarchical linear modeling (HLM) is used to estimate our model (Bryk & Raudenbush, 1992; Bliese, 2000; Raudenbush & Bryk, 2001). The HLM structural equation model (SEM) controlled for covariation among the variables measuring the employee’s age, gender, and store tenure. The structural model demonstrated excellent fit (\( \chi^2 / df = 1.322.865 / 448 = 2.95 \), RMSEA = 0.08, CFI = .928; TLI = .915). The r-squared values are presented in Table 4.

Results of Hypothesis Testing

Table 5 presents the results from our HLM SEM structural path model. Except for Hypothesis 3, all of the hypotheses are supported at the .05 level. We discuss the implications of these findings in the discussion section.

Next, we test for mediation in our model. As stated above, we believe that the relations between the external factors reflecting promotion of environmental practices, stakeholder demands to engage in environmental practices, and
Cantor, Morrow, and Blackhurst

Table 4: R-squared values.

<table>
<thead>
<tr>
<th>Latent Variable</th>
<th>Estimate</th>
<th>Standard Error</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Within</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subordinate environmental commitment</td>
<td>0.805</td>
<td>0.027</td>
<td>0.000</td>
</tr>
<tr>
<td>Subordinate engagement in environmental behaviors</td>
<td>0.785</td>
<td>0.30</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Between</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervisor environmental commitment</td>
<td>0.856</td>
<td>0.028</td>
<td>0.00</td>
</tr>
<tr>
<td>Perception of supervisor support of environmental behaviors</td>
<td>0.491</td>
<td>0.194</td>
<td>0.011</td>
</tr>
</tbody>
</table>

evironmental/revenue trade-offs and subordinate engagement in environmental behaviors are mediated by supervisory commitment to the environment, perception of supervisory support of the environment, and subordinate commitment to the environment. To assess these mediating (indirect) relationships, we added additional direct paths to our model. First, we added two direct paths from organizational promotion of environmental practices and stakeholder demands to subordinate engagement in environmental behaviors. Second, we added a direct path from supervisory commitment to the environment to subordinate commitment to the environment. We examined the significance of these indirect effects (mediation) using the Sobel (1982) test. Assessing the significance of indirect effects is consistent with recent recommendations by several scholars (e.g., MacKinnon, 2000; Shrout & Bolger, 2002). As shown in Tables 6 and 7, available in the online Appendix, all indirect effects are statistically significant. For example, the Sobel indirect effect tests of the organizational promotion to subordinate engagement in environmental behaviors and the stakeholder demands to subordinate engagement in environmental behaviors paths are significant ($p < .01$). Similarly, the Sobel indirect effect test of the supervisory commitment to subordinate commitment path is also significant ($p < .01$). However, the direct effects of organizational promotion of environmental practices and supervisory commitment to the environment are statistically significant. These results indicate that a partial mediation relationship exists in our model (i.e., our mediation analysis shows that some of the external factors perceived by store managers (i.e., supervisors) influence departmental managers (i.e., subordinates) to become engaged in environmental behaviors through supervisory commitment to the environment, perception of supervisory support of the environment, and subordinate commitment to the environment).

**DISCUSSION**

Examining the factors that affect employee voluntary engagement in environmental behaviors is a topic of great scholarly interest and importance. In this study, we focus on developing an understanding of how supervisors influence their respective subordinates to engage in environmental behaviors at the individual level of analysis using a dataset composed of supervisors and their subordinates who are employed at the same store across a large grocery retail chain. Because firms are increasingly facing pressure from stakeholders to pursue environmental-friendly
**Table 5: HLM SEM results.**

<table>
<thead>
<tr>
<th>Path Coefficient</th>
<th>Hypothesis</th>
<th>Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisor environmental commitment ← Organizational promotion</td>
<td>0.402 ** (0.066)</td>
<td>H1</td>
</tr>
<tr>
<td>Supervisor environmental commitment ← Stakeholder demands</td>
<td>0.499 ** (0.082)</td>
<td>H2</td>
</tr>
<tr>
<td>Supervisor environmental commitment ← Environmental/revenue trade-off</td>
<td>−0.143 (0.112)</td>
<td>H3</td>
</tr>
<tr>
<td>Supervisor environmental commitment ← Supervisor environmental commitment</td>
<td>0.194 ** (0.057)</td>
<td>H4</td>
</tr>
<tr>
<td>Perception of supervisor support of environmental behaviors ← Supervisor environmental commitment</td>
<td>1.011 ** (0.059)</td>
<td>H5</td>
</tr>
<tr>
<td>Subordinate environmental commitment ← Perception of supervisor support of environmental behaviors</td>
<td>0.583 ** (0.075)</td>
<td>H6</td>
</tr>
<tr>
<td>Subordinate engagement in environmental behaviors ← Age</td>
<td>−0.066 (0.009)</td>
<td></td>
</tr>
<tr>
<td>Subordinate engagement in environmental behaviors ← Gender</td>
<td>0.369 (0.181)</td>
<td></td>
</tr>
<tr>
<td>Subordinate engagement in environmental behaviors ← Years of experience at current location of firm</td>
<td>−0.002 (0.012)</td>
<td></td>
</tr>
<tr>
<td>Subordinate engagement in environmental behaviors ← Subordinate’s personal commitment to the natural environment</td>
<td>0.432 ** (0.087)</td>
<td></td>
</tr>
</tbody>
</table>

***significant at 0.01 level; ** significant at 0.05 level. Standard errors are reported in parentheses.
business practices (NAEM, 2006) and because engagement in environmental behaviors is predominantly a discretionary workplace behavior, organizations must overcome the challenge of directly marshaling individual employee involvement in environmental activities in the workplace (Sarkis et al., 2010). However, while stakeholder pressures may exist, environmental initiatives may not be mandatory (compliance driven) but driven by the value system of the organization and/or employee (Buysse & Verbeke, 2003). Not surprisingly then, there is academic and practitioner interest in developing a better understanding of how to foster employee commitment to the environment and to involve employees in activities supportive of the natural environment (Ramus & Steger, 2000; Gattiker & Carter, 2010; Cantor et al., 2012). This study also extends our understanding of employee commitment in the context of environmental initiatives.

Drawing upon stakeholder theory, commitment theory, and OST from the management and social psychology literatures, we examine how supervisory views on organizational environmental issues impact subordinates’ engagement in environmental behaviors in the workplace. Our study is also motivated in part by recent calls for research to focus on understanding individual motivations and actions (Boudreau, Hopp, McClain, & Thomas, 2003; Gino & Pisano, 2008; Bendoly, Croson, Goncalves, & Schultz, 2010). Our research seeks to heed this call by showing how operations management and organizational behavior research juxtaposed together can provide theoretical and practical insight into how a firm can motivate its employees to engage in environmental behaviors.

Additionally, this study is informative to firms that seek to garner greater support and involvement of their rank-and-file employees into environmental management practices. For example, Wal-Mart is one of several organizations investing in proenvironmental behaviors and proactively seeking ways to encourage its employees to engage in environmental behaviors that help the firm reduce the organization’s carbon footprint. As a result, Wal-Mart is acquiring a positive reputation with image conscious customers, shareholders, and its own employees (Barbaro, 2007). Therefore, our study offers broad theoretical and managerial implications worthy of discussion related to how organizations can motivate their employees to become engaged in environmental activities.

**Implications of Research Findings**

Our first important finding is that organizational promotion of environmental practices is positively related to supervisory commitment to the environment. When organizations convey their support for an initiative, supervisory employees will begin to pursue the strategic initiative. In our context, we discovered that our sponsoring organization has engaged in behaviors promoting the environment and clarifying expectations relative to environmental activities. Store managers (i.e., supervisors) are responding to this pressure and consequently elevating their commitment to the environment.

We also found evidence that demands from external stakeholders to engage in environmental practices are positively related to supervisory commitment to the environment. As mentioned above, many firms are facing increased scrutiny to pursue environmental practices. The external interest in the pursuit of environmental
Employee Engagement in Environmental Behaviors

matters is derived from customers, government regulators, company shareholders, and community organizations. As external interest in environmental practices becomes more pervasive, supervisors will become more committed to environmental management practices. We found that store managers in this organization are actively involved in the management of their operations, and are empowered to marshal their resources to align with their commitment to act in more “green” ways at their respective stores which was influenced by stakeholder demands.

We now turn to describing our finding that supervisory commitment to the environment is positively related to subordinate perception of supervisory support of the environment (PSS). Ideally, supervisors will openly demonstrate their commitment to an organization’s environmental goals by communicating the value of environmental behaviors to their subordinates. Supervisors can also convey their support of employee engagement in environmental behaviors in various ways such as encouraging subordinates to attend environmental training programs and spearheading proenvironmental behaviors like recycling. Managers can also proactively demonstrate their support of environmental behaviors by holding regular meetings with their employees on the importance of proenvironmental behavior (e.g., proenvironmental sourcing practices, energy conservation techniques, etc.). Such messages of support will increase subordinates’ perceptions that their supervisors’ genuinely support environmental behaviors in the workplace. Our findings indicate that subordinates do attend to the commitment signals emanated by supervisors and that these messages “trickle down” to the subordinates in the organization and illustrate the importance of understanding the “how” of engaging employees to participate in policies that are voluntary in nature.

Additionally, we found that subordinate perceptions of supervisory support of the environment (PSS) are positively related to the subordinate’s own commitment to the environment. This finding is consistent with previous research including Cantor et al. (2012) who investigated how organizations can signal their support for the environment which, in turn, influences the employee to become engaged in environmental activities. Our study extends their work by theorizing and empirically demonstrating that supervisory support is instrumental in influencing the subordinates’ commitment to the environment. Moreover, this study’s theoretical contribution is important because employees do, in fact, respond to signals of supervisory support. Specifically, our study demonstrates that perceptions of supervisory support (PSS) can enhance environmental commitment. Future research could build-upon our study by further examining how employees distinguish between signals of organizational and supervisory support because these two forms of support are not necessarily in alignment (Wayne, Shore, & Liden, 1997).

Our final empirical finding is that subordinate commitment to the environment is positively related to subordinate engagement in environmental behaviors. Previous research demonstrates that it is critically important to garner the commitment of employees to an organizational objective and that such commitment moves the organization a step closer to realizing an employee’s engagement in the desired behavior. Consistent with past research (e.g., Cantor et al., 2012; Robertson & Barling, 2013), we found that subordinates who are committed to the environment are more likely to engage in environmental behaviors.
Surprisingly, we did not find statistical support for the proposal that perceived trade-offs between realizing environmental and revenue goals would be negatively related to supervisory commitment to the environment. It is plausible that the store directors’ perceptions of environmental trade-offs do not affect their commitment to the environment. In the setting of this study, achieving revenue targets is a primary goal. Other goals, such as those related to the environment are secondary, especially if they entail significant resource reallocation. Stated differently, the store directors may believe that investment into environmental practices will come at the expense of revenue goals and thus these managers will not be in support of environmental practices requiring economic resources, regardless of their level of environmental commitment. Future research should continue to investigate this issue because environmental practices can be time-consuming and expensive to implement. More specifically, future research should explore how to minimize the burden that store directors could face in the pursuit of environmental practices. In so doing, future studies could explore moderating factors that could enhance a store directors’ commitment to the environment. Future research should also explore how a firm can assist supervisors with balancing revenue management objectives and the pursuit of environmental goals. Otherwise, supervisors will divert resources from environmental initiatives to projects that will clearly provide revenue-generating benefits.

The relations between the external factors reflecting promotion of environmental practices, stakeholder demands to engage in environmental practices, and environmental/revenue trade-offs and subordinate engagement in environmental behaviors were found to be partially mediated by supervisory commitment to the environment, perception of supervisory support of the environment, and subordinate commitment to the environment. Our mediation analysis reveals that some of the external factors (Table 6, available in the online Appendix) do not directly influence subordinate engagement in environmental behaviors. Rather, for example, demands from external stakeholder groups to engage in environmental practices serve to marshal up the supervisor’s commitment to the environmental and affect the subordinate’s perception of supervisory commitment to the environment, subordinate commitment to the environment, and finally subordinate engagement in environmental behaviors. In certain situations, it is plausible that the external factors could directly affect the subordinate’s engagement in environmental behaviors. Future research should examine under which conditions employees may pursue a “grass-roots” effort to engage in environmental behaviors without requiring their supervisors to be on-board with environmental initiatives.

Lastly, this study applies organizational behavior theories from the management and social psychology literatures to better understand subordinate engagement in environmental behaviors. In doing so, our study answers recent calls for greater use of theories from different disciplines (e.g., Sanders et al., 2013). By employing a cross-disciplinary lens, we have gained a deeper insight into our understanding of subordinate environmental behaviors. We have also answered calls from Morrow (2011) by identifying new antecedents of commitment and Sarkis (2013) through the development of a richer understating of proenvironmental behaviors.
CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

An overarching contribution of our research is the creation and testing of a model to examine how supervisory perceptions of external factors related to the environment impact subordinates’ engagement in environmental behaviors in the workplace. Employing stakeholder, commitment, and organizational support theories, we develop a deeper understanding of how the supervisor–subordinate relationship explains employee involvement in environmental behaviors. Moreover, the empirical support of the linkages specified in the model lends credence to broader uses of stakeholder, commitment, and OST theories in the environmental context.

Our findings are based on a data set derived from a survey of a large midwestern grocer’s supervisors and their subordinates who are employed at the same store location. Our study makes a contribution to the literature by addressing a few other issues that have impeded our understanding of employee engagement in environmental behaviors. As mentioned above, several studies that have examined environmental behavior issues to date have primarily relied on a single survey data source. Employing single source survey data leaves open the possibility of common method bias. To the best of our knowledge, our research represents one of the first environmental behavior studies to minimize this problem by using survey data from multiple key informants; namely, supervisors and subordinates who report to them at the same grocery store location, to gain a fuller accounting of environmental behavior antecedents. Moreover, survey research on environmental topics has been dominated by a nearly exclusive focus on one key informant per organization and has not considered the data derived from supervisors and their subordinates in assessing environmental behavior within an organization. This study helps to improve our understanding of factors that motivate employees to engage in environmental behavior and thus remedy these deficiencies in the literature.

We make another contribution by providing insight into the process through which organizations can achieve proenvironmental organizational change. Our model suggests that for organizations to encourage employee engagement in environmental behaviors, top management needs to clearly communicate to supervisors (e.g., store managers) their environmental management expectations. Our study suggests that corporate level environmental practices will trickle down to lower levels of the organization through supervisors who attend to the proenvironmental organizational messages, internalize them, and then promulgate these values to their subordinates. Clearly, future research investigations are necessary to confirm our insights about how organizational change can best occur because our study is cross-sectional in nature.

Future research should also examine our model across broader set of sustainability behaviors beyond environmental matters. Our findings suggest organizations need to clearly convey their support of environmental management practices to supervisors. Future research opportunities may be explored looking into how best to communicate top management’s support for environmental initiatives. In addition, future research should explore the supervisor–subordinate relationship in other types of firms and in other areas and locations in the supply chain. For example, future research may explore these relationships in other supply chain locations such as in a warehouse or even a supplier. Furthermore, recent research by Hollos,
Blome, and Foerstl (2012) illustrates the importance of environmental behaviors of suppliers on supply chain performance. The question of how to encourage these individual behaviors at a key supplier may be examined. This may be of particular importance as it has been found that consumers are willing to pay “substantially more” for products produced using environmentally friendly practices and that customers may even exact punishment for products that are perceived to have not been produced using proper environmental standards (Trudel & Cotte, 2009). Therefore, understanding how to develop engagement in environment practices in one’s own firm (as in this study) but also with supply chain partners may be of importance. Finally, Reuter, Foerstl, Hartmann, and Blome (2010) find that as firms can rapidly respond to stakeholder demands with regard to sustainability issues, a competitive advantage can be gained. Our study may serve as the foundation for future research outlining how firms (and even their supply chain partners) may become early movers in adapting environmental practices.

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article at the publisher’s website:

Table 6: Mediation Analysis of Subordinate Engagement in Environmental Behaviors:
Table 7: Mediation Analysis of Subordinate Commitment to Environmental Behaviors:

REFERENCES


Cantor, Morrow, and Blackhurst


### APPENDIX A: A MEASUREMENT MODEL RESULTS

<table>
<thead>
<tr>
<th>Latent Factor</th>
<th>(Items)</th>
<th>Non Standardized Loading</th>
<th>Standardized Loading</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organizational promotion</strong></td>
<td>Good environmental practices are promoted by ——</td>
<td>0.943</td>
<td>0.880</td>
<td>0.056</td>
</tr>
<tr>
<td></td>
<td>——motivates stores to engage in environmental practices through incentives</td>
<td>1.024</td>
<td>0.702</td>
<td>0.082</td>
</tr>
<tr>
<td></td>
<td>——communicates the importance of environmental practices</td>
<td>1.039</td>
<td>0.877</td>
<td>0.062</td>
</tr>
<tr>
<td><strong>Stakeholder demands</strong></td>
<td>Customers</td>
<td>1.214</td>
<td>0.799</td>
<td>0.082</td>
</tr>
<tr>
<td></td>
<td>Community organizations (e.g., Chamber of Commerce)</td>
<td>1.441</td>
<td>0.906</td>
<td>0.082</td>
</tr>
<tr>
<td></td>
<td>Regulatory or governmental officials (local, state, or federal)</td>
<td>1.083</td>
<td>0.635</td>
<td>0.099</td>
</tr>
<tr>
<td></td>
<td>——shareholders</td>
<td>0.851</td>
<td>0.592</td>
<td>0.085</td>
</tr>
<tr>
<td><strong>Environmental/revenue trade-off</strong></td>
<td>Firm focus on sales goals prevents following good environmental practices</td>
<td>0.712</td>
<td>0.817</td>
<td>0.047</td>
</tr>
<tr>
<td></td>
<td>Meeting sales goals and engaging in good environmental practices at the same time is difficult</td>
<td>0.649</td>
<td>0.881</td>
<td>0.039</td>
</tr>
<tr>
<td></td>
<td>Achieving firm sales goals and engaging in good environmental practices compete against one another.</td>
<td>0.571</td>
<td>0.783</td>
<td>0.040</td>
</tr>
<tr>
<td><strong>Supervisor commitment to environment</strong></td>
<td>I talk-up environmental projects and activities at my firm.</td>
<td>1.089</td>
<td>0.831</td>
<td>0.069</td>
</tr>
<tr>
<td></td>
<td>I am open to implementing firm-level environmental initiatives.</td>
<td>0.438</td>
<td>0.602</td>
<td>0.043</td>
</tr>
<tr>
<td></td>
<td>I tell others about aspects of my work that support the environment.</td>
<td>1.026</td>
<td>0.814</td>
<td>0.067</td>
</tr>
<tr>
<td></td>
<td>I am really committed to our environmental practices.</td>
<td>0.896</td>
<td>0.781</td>
<td>0.062</td>
</tr>
<tr>
<td><strong>Perception of supervisor support of environmental behaviors</strong></td>
<td>My supervisor values environmental practices.</td>
<td>0.873</td>
<td>0.947</td>
<td>0.043</td>
</tr>
<tr>
<td></td>
<td>Help is available from my supervisor when environmental problems arise.</td>
<td>0.841</td>
<td>0.853</td>
<td>0.049</td>
</tr>
<tr>
<td></td>
<td>My supervisor really cares about environmental issues.</td>
<td>0.952</td>
<td>0.904</td>
<td>0.051</td>
</tr>
<tr>
<td><strong>Subordinate commitment to environment</strong></td>
<td>I talk-up environmental projects and activities at my firm.</td>
<td>1.164</td>
<td>0.868</td>
<td>0.069</td>
</tr>
<tr>
<td></td>
<td>I tell others about aspects of my work that support the environment.</td>
<td>1.220</td>
<td>0.922</td>
<td>0.066</td>
</tr>
<tr>
<td></td>
<td>I am really committed to our environmental practices.</td>
<td>0.680</td>
<td>0.685</td>
<td>0.055</td>
</tr>
</tbody>
</table>

**Subordinate engagement in environmental behaviors**

Respondents were asked to indicate how often they engaged in activities listed below during the past 12 months.

---

*Continued*
Continued

<table>
<thead>
<tr>
<th>Latent Factor (Items)</th>
<th>Non Standardized Loading</th>
<th>Standardized Loading</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>look for opportunities to recycle job materials</td>
<td>1.166</td>
<td>0.795</td>
<td>0.077</td>
</tr>
<tr>
<td>dispose of waste in a ‘green’ way</td>
<td>0.899</td>
<td>0.692</td>
<td>0.073</td>
</tr>
<tr>
<td>look for opportunities to reuse materials.</td>
<td>1.208</td>
<td>0.863</td>
<td>0.071</td>
</tr>
<tr>
<td>replace materials with those that are more environmentally friendly.</td>
<td>1.311</td>
<td>0.825</td>
<td>0.082</td>
</tr>
<tr>
<td>conserves energy in the firm.</td>
<td>0.835</td>
<td>0.645</td>
<td>0.074</td>
</tr>
<tr>
<td><strong>Subordinate’s personal commitment to the natural environment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am willing to give things up if they harm the natural environment.</td>
<td>0.798</td>
<td>0.656</td>
<td>0.068</td>
</tr>
<tr>
<td>Even when it is inconvenient, I do what is best for the environment.</td>
<td>0.731</td>
<td>0.868</td>
<td>0.042</td>
</tr>
<tr>
<td>I take on responsibilities that help conserve the natural environment.</td>
<td>0.783</td>
<td>0.905</td>
<td>0.042</td>
</tr>
<tr>
<td>I am willing to do things for the natural environment, even if I am not thanked for my efforts.</td>
<td>0.696</td>
<td>0.892</td>
<td>0.038</td>
</tr>
</tbody>
</table>

---
a indicates firm name which has been removed for confidentiality purposes.
### APPENDIX B: RELIABILITY OF MEASURE RESULTS

<table>
<thead>
<tr>
<th>Latent Factor</th>
<th>Avg. Variance Extracted</th>
<th>Construct Reliability</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational promotion of environmental practices</td>
<td>0.68</td>
<td>0.97</td>
<td>0.84</td>
</tr>
<tr>
<td>Stakeholder demands</td>
<td>0.55</td>
<td>0.96</td>
<td>0.74</td>
</tr>
<tr>
<td>Environmental/revenue trade-off</td>
<td>0.69</td>
<td>0.98</td>
<td>0.86</td>
</tr>
<tr>
<td>Supervisor commitment to the environment</td>
<td>0.58</td>
<td>0.98</td>
<td>0.84</td>
</tr>
<tr>
<td>Perception of supervisor support of environmental behaviors</td>
<td>0.81</td>
<td>0.98</td>
<td>0.93</td>
</tr>
<tr>
<td>Subordinate commitment to the environment</td>
<td>0.69</td>
<td>0.97</td>
<td>0.86</td>
</tr>
<tr>
<td>Subordinate engagement in environmental behaviors</td>
<td>0.59</td>
<td>0.97</td>
<td>0.87</td>
</tr>
<tr>
<td>Subordinate’s personal commitment to the natural Environment</td>
<td>0.70</td>
<td>0.98</td>
<td>0.88</td>
</tr>
</tbody>
</table>
**David E. Cantor** is Walker Professor of Logistics and Supply Chain Management and associate professor of supply chain management in the College of Business at Iowa State University in Ames, Iowa. He received his PhD from the University of Maryland. His primary research interest is in supply chain management and information systems, with a particular focus on the U.S. motor carrier industry. Dr. Cantor is also interested in human decision making in the supply chain. His research on these topics has been published in many academic and managerial outlets including the *Journal of Business Logistics*, the *Journal of Operations Management*, *Decision Sciences*, the *Transportation Journal*, *Transportation Research (Logistics and Transportation Review)*, the *International Journal of Physical Distribution and Logistics Management*, and the *International Journal of Logistics Management*.

**Paula C. Morrow** is a University Professor and the Max S. Wortman, Jr. Professor of Management at Iowa State University where she received her PhD degree. Her research focuses on understanding employee attitudes and behaviors, especially relations between work-related commitment and environmental behavior, turnover, and safety. She is the author of *The Theory and Measurement of Work Commitment*, and has published over 70 refereed articles in such outlets as the *Journal of Applied Psychology*, *Academy of Management Review*, *Journal of Vocational Behavior*, *Journal of Supply Chain Management*, *Transportation Research Part E: Logistics and Transportation Review*, and *Transportation Journal*. She has provided policy advice to both public and private organizations, especially in the transportation sector.

**Jennifer V. Blackhurst** is a Professor of Management Sciences in the Tippie College of Business at the University of Iowa. She also serves as the Faculty Director for the MBA Business Analytics Career Academy and the Faculty Director of the Kathleen Dore-Henry B. Tippie Women’s MBA Leadership Program. She received her doctorate in Industrial Engineering from the University of Iowa in 2002. Her research is focused in the areas of supply chain risk and disruption management; supplier assessment and selection; and supply chain design and coordination. Blackhurst has also been actively involved in the national and international supply chain management discipline by serving on a variety of editorial review boards; she is associate editor for *Decision Sciences Journal* and she serves on the editorial review boards for *Journal of Operations Management*, *Journal of Business Logistics*, *Journal of Supply Chain Management*, and *IEEE Transactions on Engineering Management*. She is currently serving on the *Decision Sciences Board of Directors* as Secretary. In 2013, Blackhurst was recognized as Outstanding Associate Editor for *Decision Sciences Journal*. In addition, she served as the associate program chair for the Decision Sciences Institute annual conference in 2013 and will again serve as the associate program chair for the Decision Sciences Institute annual conference in 2016.