

Greening organizations through leaders' influence on employees' pro-environmental behaviors

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Summary

Climate change is a serious global issue that poses many risks to environmental and human systems. Although human activity is cited as the main cause of climate change and organizations significantly contribute to climate change, research that investigates workplace pro-environmental behaviors remains scarce. We develop and test a model that links environmentally-specific transformational leadership and leaders' workplace pro-environmental behaviors to employees' pro-environmental passion and behaviors. Structural equation modeling on data from 139 subordinate–leader dyads (M ages = 37.42 and 40.17 years, respectively) showed that leaders' environmental descriptive norms predicted their environmentally-specific transformational leadership and their workplace pro-environmental behaviors, both of which predicted employees' harmonious environmental passion. In turn, employees' own harmonious environmental passion and their leaders' workplace pro-environmental behaviors predicted their workplace pro-environmental behaviors. These findings show that leaders' environmental descriptive norms and the leadership and pro-environmental behaviors they enact play an important role in the greening of organizations. Conceptual and practical implications are discussed. Copyright © 2012 John Wiley & Sons, Ltd.

Keywords: environmentally-specific transformational leadership; green leadership; environmental sustainability; employee pro-environmental behavior

Climate change is a serious global issue that poses an urgent and perhaps one of the greatest challenges facing human kind (Kazdin, 2009; Stern, 2011; Swim et al., 2011). Although climate change can be caused by either natural variation or human activity, scientists conclude that the cause of climate change is largely anthropogenic (National Research Council, 2010; Swim et al., 2011). Furthermore, organizations are also regarded to be among the most significant contributors to climate change (Trudeau & Canada West Foundation, 2007); and in response, many have begun to adopt formal and informal environmental management systems (Darnall, Henriques, & Sadorsky, 2008). However, merely adopting these systems is insufficient. Given that climate change is largely driven by human activity, and the success of environmental programs often depends on employees' behaviors (Daily, Bishop & Govindarajulu, 2009), fostering employees' pro-environmental behavior within organizations is now critical. Encouraging workplace pro-environmental behaviors, such as recycling, conservation, and waste reduction behaviors, will not only contribute to the greening of organizations but will also positively affect climate change and prevent further environmental degradation.

The need for human behavioral modification toward more pro-environmental behaviors is well recognized by researchers, who point to the need for empirical research that investigates how promoting workplace pro-environmental behaviors can be achieved. Recently, there have been several attempts to address this. First, calls have gone out for psychologists, including those studying organizations, to become more involved in research that encourages environmentally sustainable behaviors (e.g., Kazdin's, 2009 APA Presidential Address). Second, the *Society for Industrial and Organizational Psychology* devoted one of its theme tracks during its 2009 annual meeting to corporate social responsibility (e.g., events focused on organizations' and organizational psychologists' responsibility

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to the environment). Third, the *Academy of Management* chose “Green Management Matters” as its conference theme for 2010. Despite these initiatives, there remains a dearth of research related to organizations and environmental sustainability (Huffman, Watrous-Rodriguez, Henning, & Berry, 2009; Jackson & Seo, 2010). More specifically, although there is a body of research that focuses on organizationally relevant environmental issues, such research takes place primarily at the macro level, where the organization is the unit of analysis. Organizational behavior (OB) research that investigates employees’ workplace pro-environmental behaviors remains scarce (Russell & Griffiths, 2008; Sharma, 2002). We begin to fill this gap in research and respond to recent calls for organizational researchers to focus on fostering pro-environmental behaviors within organizations by developing and testing a model that suggests that organizational greening activity can be achieved through leaders’ influence on employees’ workplace pro-environmental behaviors.

Organizational leaders influence a range of traditional organizational outcomes, such as employee attitudes, employee commitment, and organizational and financial performance (Barling, Christie, & Hopton, 2010), as well as diverse outcomes such as safety performance (e.g., Barling, Loughlin, & Kelloway, 2002) and environmental performance (e.g., Ramus & Steger, 2000). Accordingly, the model we develop and test is based on the argument that the greening of organizations can be enhanced through the influence of leaders’ environmental descriptive norms, their environmentally-specific transformational leadership, and their workplace pro-environmental behaviors. Specifically, we develop and test a model in which (i) leaders’ environmental descriptive norms predict their environmentally-specific transformational leadership and their workplace pro-environmental behaviors, which in turn (ii) predict employees’ harmonious environmental passion; and (iii) employees’ harmonious environmental passion and leaders’ workplace pro-environmental behaviors predict employees’ pro-environmental behaviors (Figure 1). Within this model, we follow Russell and Griffiths (2008) in adopting Ramus and Steger’s (2000) definition of workplace pro-environmental behaviors as “any action taken by employees that she or he thought would improve the environmental performance of the company” (p. 606). Additionally, we define environmentally-specific transformational leadership as a manifestation of transformational leadership in which the content of the leadership behaviors are all focused on encouraging pro-environmental initiatives.

Environmentally-specific transformational leadership

In the last 20 years, transformational leadership has become the most widely studied of all leadership theories and has been shown to influence diverse behaviors (Barling et al., 2010; Judge & Piccolo, 2004). Transformational

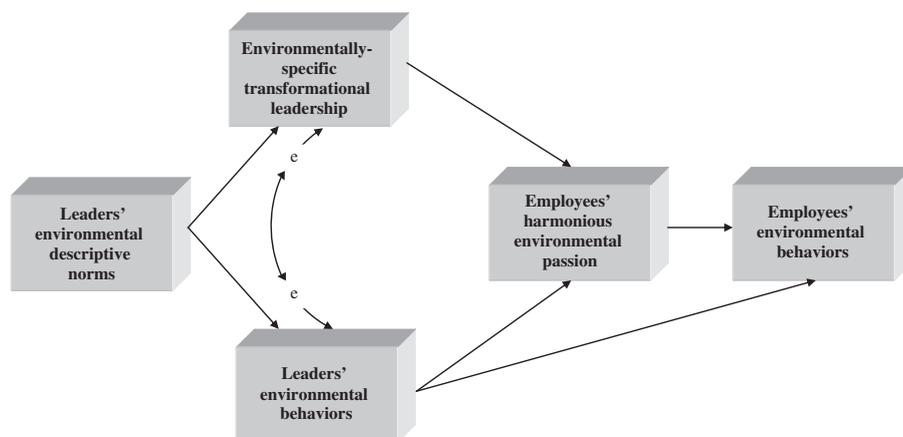


Figure 1. Proposed model

leadership includes four behaviors: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass, 1998; Bass & Riggio, 2006), each of which can be applied to influencing environmental sustainability within organizations. Idealized influence centers on leaders becoming role models by doing what is right rather than what is expedient. Leaders influence employees through their moral commitment to their followers and the collective good. In manifesting idealized influence, leaders are guided by a moral commitment to an environmentally sustainable planet (the collective good) and choose to do what is right by encouraging actions that will benefit the natural environment. In doing so, environmentally-specific transformational leaders serve as role models for subordinates, who then become more likely to engage in these behaviors themselves. Leaders high in inspirational motivation stimulate their employees to go beyond their individual needs for the collective good; they inspire subordinates through their own passion and optimism to overcome psychological setbacks and external obstacles, and to go beyond what is good for themselves by engaging in behaviors that benefit the natural environment. Intellectually stimulating leaders encourage employees to think for themselves, question long-held assumptions, and approach problems in innovative ways. Within the context of influencing environmental sustainability, leaders high in intellectual stimulation encourage subordinates to think about environmental issues for themselves, question long-held assumptions about their own and their organization's environmental practices, and address environmental problems in an innovative manner. Finally, leaders who exhibit individualized consideration display compassion and empathy for employees' well-being and help employees develop their potentials and skills. In doing so, leaders establish close relationships with followers within which they can transmit their environmental values, model their environmental behaviors, and raise questions about environmental assumptions and priorities. In short, through environmentally-specific transformational leadership, leaders use their relationship with subordinates to intentionally influence and encourage their subordinates to engage in workplace pro-environmental behaviors.

We conceptualize environmentally-specific transformational leadership as a unidimensional construct comprising the four components for several reasons. First, consistently high correlations are yielded between the four components, thereby supporting the combination of all four components (e.g., Barling et al., 2010; Bycio, Hackett, & Allen, 1995). Second, recently developed measures of transformational leadership in organizations (e.g., Herold, Fedor, & Caldwell, 2008; Rubin, Munz, & Bommer, 2005) and classroom settings (e.g., Beauchamp et al., 2010) use unidimensional scales. Third, an exploratory factor analysis on safety-specific transformational leadership vindicated the use of a unidimensional index of the construct (Barling et al., 2002). For these reasons, a unidimensional approach to environmentally-specific transformational leadership is justified.

The model we develop goes beyond specifying a direct relationship between environmentally-specific transformational leadership and subordinates' workplace pro-environmental behaviors in several ways, all of which extend our understanding of how leaders influence employees' workplace pro-environmental behaviors. Specifically, environmental descriptive norms are identified as a predictor of environmentally-specific transformational leadership and leaders' workplace pro-environmental behaviors. Further, the effects of leaders' behavioral modeling are considered together with environmentally-specific transformational leadership, and any effects of environmentally-specific transformational leadership are held to be indirect. We will now discuss each of the links in the model (Figure 1).

Leaders' environmental descriptive norms, leaders' workplace pro-environmental behaviors, and environmentally-specific transformational leadership

Descriptive norms refer to people's perceptions of what most others do (Cialdini, 2007), and these perceptions can motivate behavior by conveying important social information about effective and adaptable behavior (Cialdini, 2007; Goldstein, Cialdini, & Griskevicius, 2008). When individuals follow the lead of others, they speed up the decision-making process such that time and cognitive effort are saved, while appropriate behavior likely results (Goldstein, Griskevicius, & Cialdini, 2007). In the environmental context, environmental descriptive norms provide information that pro-environmental behaviors are effective and adaptable in the given context, and they have been shown to have powerful effects on pro-environmental behavior. For example, in a study of hotel

patrons, messages containing a descriptive norm (e.g., “join your fellow guests in helping to save the environment”) had a significantly greater effect on towel reuse (i.e., conservation behaviors) than messages containing pleas to protect the environment (Goldstein et al., 2008). Although descriptive norms can motivate pro-environmental behaviors, they can be more effective when they reference the behaviors of similar others. For example, Goldstein et al. (2008) demonstrated that messages describing situational similarities among individuals (e.g., others who also stayed in the same hotel room had reused their towels) resulted in higher rates of towel reuse among hotel patrons than messages that described less situational similarities among individuals (e.g., hotel guests in general reused their towels). Drawing on Festinger’s (1954) social comparison theory, Goldstein et al. (2007) explain that individuals adhere to descriptive norms when they reference similar others because individuals tend to follow the norms of similar others when deciding how to behave.

Following this research, we propose that environmental descriptive norms will influence leaders when they reference friends, family, and colleagues (similar others), such that leaders’ perceptions that similar others’ engage in pro-environmental behaviors will directly influence their own workplace pro-environmental behaviors. For the same reasons, leaders’ environmental descriptive norms will influence the behaviors they choose to emphasize and encourage among their subordinates when in leadership positions, and therefore, will affect their own environmentally-specific transformational leadership. Accordingly, we hypothesize that

Hypothesis 1a: Leaders’ environmental descriptive norms will influence their workplace pro-environmental behaviors.

Hypothesis 1b: Leaders’ environmental descriptive norms will influence their environmentally-specific transformational leadership.

Environmentally-specific transformational leadership and leaders’ workplace pro-environmental behaviors

Leaders’ environmentally-specific transformational leadership and their own workplace pro-environmental behaviors both fulfill significant roles in understanding employees’ workplace pro-environmental behaviors. Specifying the relationship between the two leadership variables, however, is complicated by the absence of prior research. Thus, we cannot favor either of the two possible unidirectional effects (i.e., leaders’ environmentally-specific transformational leadership predicts their pro-environmental behaviors, or that their pro-environmental behaviors predict their environmentally-specific transformational leadership). However, given that ipsative behavioral consistency (i.e., behavioral consistency across situations, within individuals; Sherman, Nave, & Funder, 2010) becomes more likely as situations become more similar, and both leader behaviors we are studying are enacted in the same situation (i.e., in the context of an organization where a leader is influencing a follower), our proposed model acknowledges that there will be a significant correlation between leaders’ environmentally-specific transformational leadership and their own pro-environmental behaviors. Accordingly, we hypothesize that

Hypothesis 2: Environmentally-specific transformational leadership and leaders’ workplace pro-environmental behaviors will be positively correlated.

Environmentally-specific transformational leadership and subordinates’ harmonious environmental passion

Any effects of transformational leadership on individual behaviors are invariably indirect (e.g., Barling et al., 2010), and we accord a similar indirect role to environmentally-specific transformational leadership by predicting that

its influence on employees' workplace pro-environmental behaviors will be mediated by employees' harmonious passion for the environment. Harmonious passion reflects a positive emotion that remains under the individual's control and results in motivation to engage in the activity or relationship that is the target of the passion (Vallerand et al., 2007). For the purpose of our study, we define harmonious environmental passion as a positive emotion that results in an individual wanting to engage in pro-environmental behaviors. Thus, together with prior research that suggests (i) that leaders evoke emotions in followers (Dasborough & Ashkanasy, 2002) and (ii) that transformational leadership behaviors can spark employee passion (Cardon, 2008), we suggest that each of the four transformational leadership behaviors is especially suited to evoking employees' harmonious passion for environmental sustainability.

First, through the moral commitment to the environment that is characteristic of idealized influence, environmentally-specific transformational leaders will likely elicit employees' harmonious passion for the environment. Similarly, enunciating a vision in which environmental sustainability is paramount signals what is most important in the workplace and to the leader. Employees are more likely to be passionate about something of organizational and social importance. Second, by encouraging employees to go beyond their own needs for the collective good, and inspiring them to achieve more than they thought they could, leaders who manifest inspirational motivation will engage employees' harmonious environmental passion. Specifically, inspirational motivation will create optimism about one's personal contribution to the organization's environmental sustainability and thus ignite employees' passion. Third, consistent with intellectual stimulation, encouraging employees to think about the environment in new and optimistic ways, and thinking about the effects one's own behavior can have on the environment, will engage followers' harmonious passion for this issue. Fourth, the interpersonal behaviors consistent with individualized consideration (e.g., caring, mentoring) create an interpersonal relationship in which employees are more amenable to leaders' influence about environmental issues. Thus,

Hypothesis 3: Environmentally-specific transformational leadership will influence subordinates' harmonious passion for the environment.

Leaders' workplace pro-environmental behaviors, subordinates' workplace pro-environmental behaviors, and harmonious environmental passion

One of the sturdiest findings in the social psychological literature is that individuals learn by observing others' behaviors and subsequently, initiate and sustain similar patterns of behavior themselves (Bandura, 1977). While initial research focused mainly on learned aggression, Bandura (1986) subsequently noted that just about anything can be learned by observing others' behaviors. Research now shows that organizations' cultures can be transmitted to employees through modeling by leaders (Schein, 1995) and that role models influence ethical conduct and pro-social behavior (Brown, Trevino, & Harrison, 2005; Bryan & Test, 1967). Following this research, we suggest that leaders can also influence subordinates' workplace pro-environmental behaviors via modeling.

Organizational leaders are ideally placed to serve as role models because of their position, status, and power (Brown et al., 2005). By displaying a consistent pattern of pro-environmental behaviors, leaders signal to employees that such behaviors are valued and expected in the workplace. In doing so, subordinates learn that enacting such a behavior will lead to desirable consequences and therefore will be motivated to engage in these same behaviors themselves. Unlike environmentally-specific transformational leadership, leaders engage in workplace pro-environmental behaviors to be consistent with their values rather than through any intention to influence others. In turn, when employees watch their leaders engage in workplace pro-environmental behaviors, they learn (i) that such behaviors are valued, expected, and rewarded; and (ii) how they can engage in similar behaviors. Thus, we hypothesize that

Hypothesis 4a: Leaders' workplace pro-environmental behaviors will influence subordinates' workplace pro-environmental behaviors.

In addition, emotional contagion occurs among subordinates when they watch their leaders passionately engage in workplace pro-environmental behaviors. Emotional contagion refers to the automatic and unconscious process by which individuals harmonize and imitate facial expressions, vocalizations, and movements of others, thereby resulting in the transfer of emotions between individuals (Hatfield, Cacioppo, & Rapson, 1994). Research in both laboratory and field settings demonstrate that emotional contagion occurs between leaders and followers (e.g., Cherulnik, Donley, Wiewel, & Miller, 2001; Johnson, 2008; Lewis, 2000; Sy, Cote, & Saavedra, 2005) and is an important leadership process (Johnson, 2008). Consistent with this research and the emotional nature of passion (Cardon, Wincent, Singh, & Drnovesek, 2009), we propose that subordinates will synchronize and imitate the expressions, vocalizations, and movements their leaders emit when passionately engaging in pro-environmental behaviors. In turn, this will result in emotional contagion and, consequently, ignite employees' harmonious passion for the environment.

Hypothesis 4b: Leaders' workplace pro-environmental behaviors will influence subordinates' harmonious passion for the environment.

Subordinates' harmonious environmental passion and workplace pro-environmental behaviors

Finally, we predict that employees' harmonious environmental passion will lead to workplace pro-environmental behaviors for several reasons. First, experiencing harmonious passion is energizing, leaves individuals inspired to make a difference (Cardon et al., 2009; Vallerand et al., 2003), and results in a motivation to engage in the activity that is the object of the passion (Vallerand et al., 2007). In the context of harmonious environmental passion, this would include engaging in behaviors that should improve the environment. Second, positive emotions (e.g., happiness and joy) influence workplace pro-environmental behaviors (e.g., Fineman, 1996; Russell, 2010), and harmonious environmental passion is a positive emotion. Third, indirect support for the role of environmental harmonious passion as a mediator derives from a recent study showing that harmonious passion can indeed play a mediating role (e.g., Dong, Chen, & Yao, 2011). Thus, we hypothesize that

Hypothesis 5: Subordinates' harmonious environmental passion will influence their workplace pro-environmental behaviors.

Current study

Taken together, the present study addresses two major research questions: (i) Do leaders' environmentally-specific transformational leadership and workplace pro-environmental behaviors influence employees' workplace pro-environmental behaviors? and (ii) What variables predict environmentally-specific transformational leadership and leaders' workplace pro-environmental behaviors? To investigate these research questions, and to shed light on the role of leaders in the greening of organizations, we developed and tested a model that stipulates (i) environmental descriptive norms predict leaders' environmentally-specific transformational leadership and their workplace pro-environmental behaviors, both of which predict employees' harmonious environmental passion; and that (ii) employees' workplace pro-environmental behaviors are predicted by their own harmonious environmental passion and their leaders' workplace pro-environmental behaviors (Figure 1). In testing this model, we used multi-source data to exclude any threats from mono-method bias.

Method

Proposed model

Sample recruitment and participants. To test our model, we analyzed leader–follower dyads (e.g., Hirst, Van Dick, & Van Knippenberg, 2009; Wang & Cheng, 2010). Participants consisted of both leaders and their subordinates in the U.S. and Canada and were recruited through StudyResponse (The StudyResponse Project, 2004). Participation required that panelists were (i) either employees or in a leadership position, (ii) willing to invite their leader/subordinate to participate (depending on which role they filled), and (iii) interacted with each other at least once per week. Existing panelists were only asked for a single match, so one supervisor selected and invited one subordinate (or vice versa). StudyResponse recruited 231 dyads, from which 188 pairs completed the surveys. However, after eliminating dyads because of missing data, we retained 139 pairs for analysis, yielding an effective response rate of 60.17 percent. Because of the number of dyads for which one partner's data was not available, we assessed whether there were significant differences in the gender, age, or educational level for either the leaders or the subordinates in terms of the dyads retained for analyses versus those who were dropped; no significant differences emerged in any of these analyses, $p > .05$.

The average age of the 139 leaders (61.6 percent men) was 40.17 years, and the average age of the 139 subordinates (52.5 percent men) was 37.42 years. Descriptive data and reliability for all study variables appear in Table 1.

Measures

Because of a lack of existing measures, we created scales specifically for this study to measure environmental descriptive norms, harmonious environmental passion, and workplace pro-environmental behaviors. To help develop and refine our measures, we used a convenience sample of six volunteer doctoral students in OB, all of whom were familiar with the conceptualization and application of descriptive norms, harmonious passion, and environmental behaviors to the organizational context. We provided the graduate students with a definition of the construct of interest and a list of items we generated to measure this construct. Students then reviewed the items to ensure that they were clear, concise, and reflected the definition of the construct. Items were deleted if the majority of volunteer graduate students and the authors collectively agreed that an item was hard to understand (i.e., not clear and concise) and/or did not reflect the construct's definition. We undertook this process to provide some evidence for the understandability and face validity of our measures.

Table 1. Descriptive statistics, intercorrelations, and reliabilities for all study variables ($N = 139$).

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Employee age	37.42	9.58								
2. Leader age	40.17	10.73	.53**							
3. Leader descriptive norms	0.67	0.32	.13	−.06	.77					
4. Leader ratings: ETFL	2.36	1.06	−.22**	−.28**	.36**	.95				
5. Employee ratings: ETFL	2.03	1.15	−.12	−.30**	.36**	.70**	.96			
6. Leader environmental behavior	3.43	1.04	.01	−.18*	.42**	.62**	.51**	.86		
7. Employee environmental behavior	3.49	1.15	.11	−.12	.41**	.49**	.53**	.64**	.88	
8. Employee environmental passion	3.73	0.98	−.05	−.16	.32**	.51**	.53**	.51**	.82**	.96

Reliability of leaders' descriptive norms is based on the Kuder–Richardson (KR20) because the scaling is dichotomous, not continuous. ETFL refers to environmentally-specific transformational leadership.

* $p < .05$; ** $p < .01$.

Leaders' environmental descriptive norms

We constructed eight questions to measure leaders' environmental descriptive norms. Upon reviewing these items with the graduate students, we deleted three items that asked if respondents talked about environmental issues with children, extended family, friends, and/or coworkers because we determined that talking about environmental issues does not reflect perceptions that others engage in pro-environmental initiatives (i.e., the definition of environmental descriptive norms). The five remaining questions asked whether participants' family, friends, or coworkers practice pro-environmental behaviors, endorse environmental programs, or work for environmental organizations. Sample questions include "Do your family members and/or friends endorse environmentally friendly programs" and "Do your co-workers practice environmentally friendly behaviors that you know about or have seen"; leaders responded with "yes," or "no."

Environmentally-specific transformational leadership

In an attempt to increase response rates by keeping the survey short, we used selected items (e.g., Barling et al., 2002; Jung & Avolio, 2000) from the Multifactor Leadership Questionnaire (Avolio & Bass, 1995) to assess subordinates' perceptions of their leaders' environmentally-specific transformational leadership and leaders' self-perceptions of their environmentally-specific transformational leadership. Specifically, we selected seven items that reflect each of the four behaviors of transformational leadership and that could be modified to ensure that they were appropriate for the context of influencing environmental sustainability. Subordinates and leaders rated how frequently each item described their leaders' behaviors (0 = *not at all*, 4 = *frequently if not always*). We conducted separate exploratory factor analyses with varimax rotation on leaders' and subordinates' ratings of environmentally-specific transformational leadership, which yielded a single factor accounting for 83.41 and 80.72 percent of the variance, respectively, justifying the use of a unidimensional scale. Leaders' self-ratings of environmentally-specific transformational leadership were correlated with subordinates' corresponding ratings ($r = .70, p < .01$).

Harmonious passion for the environment

We developed 15 items to measure subordinates' harmonious environmental passion. We again provided volunteer graduate students with a definition of the construct and examined these items; as a result of which, we excluded five items because they did not reflect the construct of interest. Sample items include "I am passionate about the environment" and "I enjoy engaging in environmentally friendly behaviors," each rated on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*).

Workplace pro-environmental behaviors

On the basis of Ramus and Steger's (2000) definition of workplace pro-environmental behaviors, the "How to 'Green' your Workplace: a TUC Guide" (TUC Green Workplaces, 2007), and the environmental psychology literature (e.g., Garling, Fujii, & Garling, 2003; Staats, Harland, & Wilke, 2004), we generated 17 items to assess environmental behaviors that individuals can engage in while at work. Together with the volunteer graduate students, we determined that seven items were not clear, concise, and/or did not reflect the construct's definition, and deleted them on this basis. Sample items of those included in the final questionnaire are "I print double-sided whenever possible" and "I turn lights off when not in use." We deleted three additional items ("I keep my computer running when I'm not using it"; "I use the elevator rather than the stairs"; and "I drive to work by myself") because they reduced the reliability of the scale. Both leaders and subordinates indicated the frequency with which they engaged in each of the behaviors on a 5-point scale (1 = *never*, 5 = *always*), and we included a "not applicable" option.

Items developed specifically for this study (i.e., environmental descriptive norms, harmonious environmental passion, and workplace pro-environmental behavior scales) appear in Appendix A.

Measurement model

Because several of the scales were constructed specifically for this study, we first tested a measurement model to provide some evidence for the validity of the measures.

Sample

We tested the measurement model on a sample of undergraduate students who received course credit for their participation. We recruited students through a research participant pool at a Canadian business school. To participate, student volunteers had to have worked full time and report to a supervisor during the previous summer; 225 eligible undergraduate students completed the study. The minimum age of the student sample was 18 years, and the typical age of the undergraduate students in the program from which we sampled from ranges from 18 to 23 years.

Measures

The undergraduate students completed the same measures completed by the sample used to test our proposed model. Eligible students provided data on their perceptions of their leaders' environmentally-specific transformational leadership, and their own harmonious environmental passion and workplace pro-environmental behaviors. Given the student sample, however, we could not obtain leaders' self-reports of environmental descriptive norms or workplace pro-environmental behaviors. Because we were interested in validating the items used, and not the source, we measured students' self-reports of their own environmental descriptive norms and workplace pro-environmental behaviors.

Results

Testing the measurement model

Following Bagozzi and Edwards (1998), we first computed exploratory factor analyses and formed parcels of two or three items such that each parcel had approximately the same average factor loadings. We estimated all analyses by using maximum likelihood estimation as implemented in AMOS 19 (IBM, Armonk, New York, USA) and we based our analyses on the covariance matrix. Separate confirmatory factor analyses tested a 4-factor model (the predicted model) and three comparison models: (i) a 3-factor model reflecting a behavioral factor (perceptions of leaders' environmentally-specific transformational leadership and employees' own workplace pro-environmental behaviors) and separate factors for employees' harmonious environmental passion and environmental descriptive norms; (ii) a 2-factor model reflecting a leadership factor (perceptions of leaders' environmentally-specific transformational leadership) and a separate factor for employees' workplace pro-environmental behaviors, harmonious environmental passion, and environmental descriptive norms; and (iii) a single-factor model with all the items loading on one factor.

The 4-factor model provided a very good absolute fit to the data $\chi^2(38, N=225)=44.27, ns; \chi^2/df=1.17; CFI=0.99, NFI=0.97$, parsimonious normed fit index ($PNFI$)=0.56; $RMSEA=0.025$; test of RMSEA significance ($PCLOSE$)=0.92. The three comparison models all provided poor absolute fits to the data (Table 2). In addition,

Table 2. Measurement model.

	χ^2	<i>df</i>	χ^2/df	<i>CFI</i>	<i>NFI</i>	<i>PNFI</i>	<i>RMSEA</i>	<i>PCLOSE</i>
Four-factor	44.27	38	1.16	0.99	0.97	0.56	0.025	0.92
Three-factor	362.81	41	8.85	0.78	0.76	0.47	0.176	0.00
Two-factor	138.98	43	3.23	0.93	0.91	0.59	0.094	0.00
One-factor	761.00	44	17.30	0.51	0.50	0.34	0.253	0.00

Note: $N=225$. $PNFI$, parsimonious normed fit index; $PCLOSE$, test of $RMSEA$ significance.

the 4-factor model provided a significantly better fit to the data than the 3-factor ($\Delta\chi^2/df=318.54/3$, $p < .01$), 2-factor ($\Delta\chi^2/df=94.71/5$, $p < .01$), and 1-factor ($\Delta\chi^2/df=716.73/6$, $p < .01$) models.

Testing the proposed model

We operationalized the proposed model as a manifest variable path analysis using maximum likelihood estimation as implemented in AMOS 19. We again based all analyses on the covariance matrix. To avoid threats from mono-method bias, we obtained data from both leaders and subordinates (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Specifically, leaders provided data on their own descriptive norms, environmentally-specific transformational leadership, and pro-environmental behaviors; and subordinates rated their leaders' environmentally-specific transformational leadership, and their own harmonious passion and workplace pro-environmental behaviors. Leaders' and subordinates' ratings of environmentally-specific transformational leadership were highly correlated ($r = .70$). Thus, to avoid common-method bias, we took data for leaders' environmental descriptive norms, environmentally-specific transformational leadership, and leaders' workplace pro-environmental behaviors from leaders' self-reports, whereas we derived data on subordinates' harmonious environmental passion and workplace pro-environmental behaviors from followers' self reports.

The proposed model provided a good absolute fit to the data, $\chi^2(3, N=139)=5.30$, ns ; $CFI=0.99$; $NFI=0.98$; $PNFI=0.20$; $RMSEA=0.075$; $PCLOSE=0.27$ (see Table 3). We show the standardized parameter estimates for the proposed model in Figure 2. As predicted, subordinates' workplace pro-environmental behaviors were predicted by their own harmonious environmental passion ($\beta = .66$, $p < .01$) and by leaders' workplace pro-environmental behaviors ($\beta = .31$, $p < .01$). In turn, subordinates' harmonious environmental passion was predicted by leaders'

Table 3. Fit indices for the three models.

Model	χ^2	df	χ^2/df	CFI	NFI	$PNFI$	$RMSEA$	$PCLOSE$
Proposed model	5.30	3	1.77	0.99	0.98	0.20	0.075	0.27
Fully mediated	37.64	4	9.41	0.90	0.89	0.24	0.247	0.00
Alternative partially mediated	56.89	4	14.22	0.84	0.83	0.22	0.310	0.00

Note: $N=139$. PNFI, parsimonious normed fit index; PCLOSE, test of RMSEA significance.

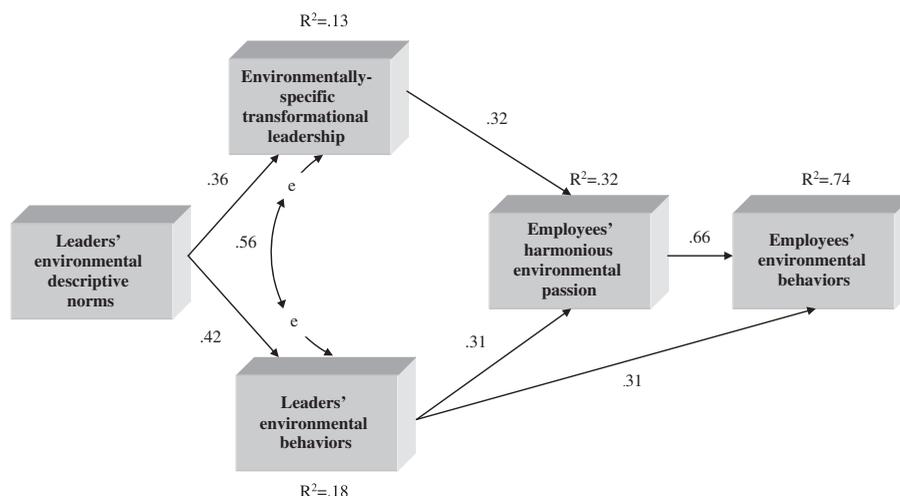


Figure 2. Results of structural equation modeling

environmentally-specific transformational leadership ($\beta = .32, p < .01$) and leaders' workplace pro-environmental behaviors ($\beta = .31, p < .01$). Leaders' workplace pro-environmental behaviors and environmentally-specific transformational leadership were significantly related ($\beta = .56, p < .01$); and leaders' environmentally-specific transformational leadership and their workplace pro-environmental behaviors were predicted by leaders' environmental descriptive norms ($\beta = .36, p < .01$ and $\beta = .42, p < .01$, respectively). See Figure 2 for R^2 values¹.

We compared the goodness of fit of the proposed model with two alternative models, namely a fully mediated model (which removes the path between leaders' and subordinates' workplace pro-environmental behaviors) and an alternative partially mediated model (which deletes the correlation between leaders' environmentally-specific transformational leadership and leaders' workplace pro-environmental behaviors). The fully mediated model provided a poor absolute fit to the data— $\chi^2(4, N = 139) = 37.64, p < .01$; $CFI = 0.90$; $NFI = 0.89$; $PNFI = 0.24$; $RMSEA = 0.247$ $PCLOSE = 0.00$ —as did the alternative partially mediated model— $\chi^2(4, N = 139) = 56.89, p < .01$; $CFI = 0.84$; $NFI = 0.83$; $PNFI = 0.22$; $RMSEA = 0.310$; $PCLOSE = 0.00$ (see Table 3). In addition, the proposed model provided a significantly better fit to the data than both the fully mediated model, $\Delta\chi^2/df = 32.34/1, p < .01$, and the alternative partially mediated model, $\Delta\chi^2/df = 51.59/1, p < .01$.

Discussion

The extent and pace of climate change has increased drastically over the past several decades (National Research Council, 2010), resulting in a serious global concern that is arguably one of the greatest challenges facing human kind (Kazdin, 2009; Stern, 2011; Swim et al., 2011). As climate change and its effects are likely irreversible (Solomon, Plattner, Knutti, & Friedlingstein, 2009), the importance of preventing any further damage cannot be over-emphasized. Given that climate change is largely caused by human activity (National Research Council, 2010; Swim et al., 2011) and organizations have been regarded as significant contributors to climate change (Trudeau & Canada West Foundation, 2007), empirical research that investigates how environmentally sustainable behaviors within organizations can be encouraged is needed. Accordingly, the primary goal of this study was to examine how leaders can affect organizational greening activity through their influence on employees' pro-environmental passion and behaviors. To this end, we developed and tested a model linking leaders' environmental descriptive norms to their environmentally-specific transformational leadership and their workplace pro-environmental behaviors, and leaders' environmentally-specific transformational leadership and their workplace pro-environmental behaviors to employees' workplace pro-environmental behaviors. The mediating role of employees' harmonious environmental passion is emphasized in the model (Figure 2). The data provided strong support for the proposed model, and several of the findings offer important contributions to green OB and OB research more broadly.

To begin, our findings advance our understanding of green leadership in various ways. First, although others have noted that environmental leaders are most likely to exhibit a transformational leadership style (Egri & Herman, 2000), there is no empirical research investigating the effects of transformational leadership or any other leadership theory on environmental sustainability within organizations (Barling et al., 2010). Our model demonstrated that when transformational leadership behaviors are focused on encouraging pro-environmental initiatives, environmentally-specific transformational leaders can positively affect employees' pro-environmental passion and behaviors. Second, although the vast majority of existing research on leadership focuses on its consequences, our research points to some of the determinants to green leadership. Within the constraints of the cross-sectional data used in the current study, we identified leaders' environmental descriptive norms as a potential antecedent of environmentally-specific

¹We tested an alternative model that uses subordinates' ratings of their leaders' environmentally-specific transformational leadership, and found that when the model is specified in this alternative way, the model still fits the data, $\chi^2(3, N = 139) = 3.75, ns$; $\chi^2/df = 1.25$; $CFI = 0.99$; $NFI = 0.99$; $PNFI = 0.20$; $RMSEA = 0.042$; $PCLOSE = 0.43$.

transformational leadership and leaders' workplace pro-environmental behaviors. Third, unlike research on transformational leadership, which generally examines its effects in isolation, our research focuses on the effects of two aspects of green leadership. Specifically, we investigated the effects of both environmentally-specific transformational leadership and leaders' workplace pro-environmental behaviors. The results showed that these two variables independently and significantly predicted employees' harmonious environmental passion.

Our findings also uncover some of the determinants of employees' workplace pro-environmental behaviors. Our findings point to the indirect role of environmentally-specific transformational leadership, suggesting that leaders indirectly influence their followers' workplace pro-environmental behaviors when they (i) share their values (idealized influence), (ii) convince followers that they can achieve at levels previously considered almost impossible (inspirational motivation), (iii) help employees think about issues in new and innovative ways (intellectual stimulation), and (iv) establish a relationship with their employees (individualized consideration) through which they can exert an influence on pro-environmental behaviors. Our findings also point to a modeling influence on employees' workplace pro-environmental behaviors that is consistent with social learning theory (Bandura, 1977). As employees see their leaders voluntarily enact pro-environmental behaviors, they make inferences about their leaders' values, and about the desirability of different behaviors, and respond accordingly. Finally, expanding on previous research that suggests that positive emotions influence workplace pro-environmental behaviors (e.g., Fineman, 1996; Russell, 2010), our results support a direct influence of employees' harmonious environmental passion on their workplace pro-environmental behaviors. When employees experience this positive emotion, they become energized, inspired to make a difference in the quality of the natural environment, and are motivated to engage in workplace pro-environmental behaviors.

Further, the current study offers several contributions to transformational leadership research by replicating and expanding knowledge derived from transformational and safety-specific transformational leadership studies. First, our study expands on transformational leadership research by taking the nature of the targeted behaviors into consideration. Focusing on the effects of general transformational leadership on specific behaviors (e.g., pro-environmental behaviors) might limit our understanding of the potential effectiveness of target-specific transformational leadership in attaining targeted outcomes. The rationale for this is that the expression of the four components of transformational leadership may differ depending on the types of outcomes targeted. Transformational leadership that focuses on influencing specific behaviors (whether safety or environmentally-specific) will provide considerable clarification to employees as to what leaders value, thereby enhancing employees' role clarity (Beehr & Glaser, 2005).

Second, although very few studies have focused on transformational leadership that influence targeted behaviors, safety has been the focus of inquiry (Barling et al., 2002; Conchie & Donald, 2009; Conchie, Taylor & Donald, 2012; Kelloway, Mullen, & Francis, 2006; Mullen & Kelloway, 2009; Mullen, Kelloway, & Teed, 2011). Our study extends these studies by expanding the focus of transformational leadership to include environmentally-specific transformational leadership. In doing so, we suggest that transformational leadership is a broad construct that is composed of different, target-specific sub-dimensions. Similar to organizational climate research that was initially general in focus and then progressed to focus on a climate "for something" (Schneider, Bowen, Ehrhart, & Holcombe, 2000), transformational leadership research may move forward by shifting its focus from general to target-specific transformational leadership. Consequently, the way in which we study, practice, and teach leadership may fundamentally change, and a new set of research questions may arise.

Third, our study expands on safety-specific transformational leadership research by investigating a different mediator variable (e.g., harmonious environmental passion), exploring the indirect effects of environmentally-specific transformational leadership together with direct and indirect effects of other variables (e.g., leaders' workplace pro-environmental behaviors) on subordinates' workplace pro-environmental behaviors, and by examining predictors (e.g., environmental descriptive norms) of environmentally-specific transformational leadership.

Fourth, our research contributes to the OB literature more broadly in several ways. Our study identified environmental descriptive norms as an antecedent of environmentally-specific transformational leadership and leaders' workplace pro-environmental behaviors, indicating that what leaders' friends and family do (i.e., descriptive norms) can spill

over to the organizational context and influence members' behaviors. Extending this to the broader OB literature suggests that descriptive norms may play a role as an antecedent to other organizationally relevant variables (e.g., safety practices, counterproductive workplace behaviors, and other leadership styles), and future research should investigate descriptive norms as an antecedent. Next, our study established environmental harmonious passion as an important predictor of workplace pro-environmental behaviors, which raises the question of whether harmonious passion might influence other organizational behaviors? Future research may benefit by examining the effect of harmonious passion for equality on leaders' distributional, procedural, and interactional justice behaviors, or the effect of harmonious passion for helping on organizational citizenship behaviors. Finally, along with other initial research (e.g., Fineman, 1996; Russell, 2010; Russell & Griffiths, 2008), our findings suggest that pro-environmental behaviors are an important aspect of organizational life, which may affect other organizationally relevant outcomes. For example, previous research has shown that individuals who engage in general pro-environmental behaviors experience gains in subjective well-being (e.g., Brown & Kasser, 2005) and self-esteem (Kasser, 2005; Richins & Dawson, 1992). Extending this to an organizational context suggests that engaging in workplace pro-environmental behaviors may positively influence similar organizational outcomes, including job satisfaction and job-related self-esteem, and thereby raises new questions of general interest to the OB field.

Future research

As research focusing on employees' workplace pro-environmental behaviors remains sparse, several areas for future research are offered. First, in addition to environmental descriptive norms, other variables may predict leaders' environmentally-specific transformational leadership and workplace pro-environmental behaviors. For example, research identifies the importance of role identity salience in predicting prosocial behavior (Charng, Piliavin, & Callero, 1988; Piliavin, Grube, & Callero, 2002), and researchers have applied a prosocial behavior framework to analyzing pro-environmental behaviors (Kollmuss & Agyeman, 2002). Others have suggested that pro-environmental behaviors can be viewed as a combination of self-interest and prosocial motives (Bamberg & Moser, 2007). Accordingly, future research should investigate the effects of role identity salience on leaders' workplace pro-environmental behaviors. Additionally, Arnocky, Stroink, and DeCicco (2007) suggest that metapersonal self-construal (inclusion of all living things in the perception of the self; Stroink & DeCicco, 2007) predicts environmental concern and behaviors. Researchers might investigate metapersonal self-construal as a predictor of environmentally-specific transformational leadership.

Second, additional mediators might be uncovered. Studies consistently show that employee attitudes (e.g., trust in the leader, organizational commitment) mediate the relationship between leadership and employee behaviors (e.g., Barling et al., 2010), and similar variables might be investigated in future research focusing on leadership and pro-environmental behaviors. Third, there may be important moderators of the relationships identified in the model. For example, both leader and follower age may moderate any effects of environmentally-specific transformational leadership and leaders' workplace pro-environmental behaviors. Specifically, any effects uncovered may be stronger for younger leaders and subordinates, as younger individuals tend to be more environmentally oriented, less committed to the ideals of economic growth, and less concerned about the conflict between environmentalism and economic interests than older people (Jones & Dunlap, 1992; Malkis & Grasmick, 1977).

Fourth, meta-analytic findings show that organizations' environmental performance predicts their financial performance (Orlitzky, Schmidt, & Rynes, 2003). As such, investigating this and other consequences of leaders' and subordinates' workplace pro-environmental behaviors for the organization is an important avenue for future research. Future research should also investigate other variables that might predict subordinates' workplace pro-environmental behaviors. For example, several studies have pointed to the role of external pressures in shaping environmental performance at the organizational level (e.g., Henriques & Sadorsky, 1996; Laplante & Rilstone, 1996; Zhang et al., 2008). Future research could expand on this and assess the effect of external pressures on individuals' behavior. Additionally, researchers should investigate the predictive role of team level

variables, pro-environmental beliefs, and personality variables (e.g., conscientiousness), as these variables might add to our understanding of factors that influence workplace pro-environmental behaviors.

Fifth, future research should examine the effects of leadership in conjunction with other organizationally relevant variables in promoting workplace pro-environmental behaviors. For example, a body of literature is beginning to examine the role of human resource management practices in the greening of organizations (Jackson, Renwick, Jabbour, & Muller-Camen, 2011; Jackson & Seo, 2010). Future research should expand on this literature by investigating the additive effects of environmentally-specific transformational leadership, leaders' workplace pro-environmental behaviors, and human resource management practices on employees' workplace pro-environmental behaviors.

Sixth, future research should investigate alternative models that examine the influence of different leadership styles on employees' harmonious environmental passion and their workplace pro-environmental behaviors. For example, given that negative aspects of leadership, such as *laissez faire* behaviors, have been shown to have negative effects (e.g., on safety; Kelloway et al., 2006), future research might examine the potential negative relationship between *laissez faire* leadership and employees' harmonious environmental passion and their workplace pro-environmental behaviors. Further, data from this study provide evidence that environmentally-specific transformational leadership indirectly influences employees' workplace pro-environmental behaviors through their harmonious environmental passion. Going forward, future research should advance and test an alternative model that investigates the influence of general transformational leadership. Extending this, future research should examine the difference between environmentally-specific and general transformational leadership, and determine whether one type of leadership style evokes higher levels of workplace pro-environmental behaviors.

Like all research, several aspects of this study warrant some caution and suggest additional avenues for future research. First, the cross-sectional nature of this study precludes any causal inferences. To allow for causal inference, future research should go beyond the constraints of the cross-sectional data used in the current study and include longitudinal or time series data. Conducting longitudinal studies in the future will also allow researchers to consider the possibility of reverse causal ordering. Specifically, a reverse causal model, in which employees' harmonious environmental passion and workplace pro-environmental behaviors influence their leaders' environmentally-specific transformational leadership and/or their leaders' workplace pro-environmental behaviors, should be examined. Finding support for such a model would imply that employees play an active role in the leader-subordinate relationship, whereby subordinates influence their leaders, rather than the passive role that is traditionally assumed.

Second, we collected data across a variety of organizations, leaving it impossible to isolate any cross-level effects on employees' or leaders' behaviors. Third, we created a number of scales for the purposes of this study, as no existing scales measuring the relevant variables were available. Although we tested a measurement model to assess the scales we created, the measurement model by itself provides only limited evidence for the measures' validity (e.g., we do not assess the measures' content, divergent, convergent, or criterion-related validity). Future research should focus on developing stronger measures by providing further evidence for the measures' content and construct validity. Fourth, the measurement model that we used to assess the validity of the scales developed specifically for this study was based on subordinates only. Future research should replicate the measurement model with data obtained from leader and subordinate dyads to reduce the possibility of rival hypotheses that the measurement model is sample dependent.

Fifth, consistent with previous research on workplace pro-environmental behaviors that invariably describes and measures these behaviors in different ways (Russell & Griffiths, 2008), our study relied upon a newly developed measure of workplace pro-environmental behaviors that was not fully validated. In order to advance green OB research, development of a consensually agreed upon definition and a psychometrically validated questionnaire of workplace pro-environmental behaviors should now be a priority.

Sixth, in the proposed model, we did not obtain data for subordinates' ratings of their leaders' workplace pro-environmental behaviors. It is possible that subordinates will not see all of the workplace pro-environmental behaviors their leaders enact, especially those that are engaged in private. Thus, the effect of role modeling may be underestimated in this study. Future research might profitably focus on subordinates' reports of their leaders' workplace pro-environmental behaviors to get a more accurate index of the effects of role modeling.

Despite these limitations, there are several strengths to this study. First, to confront possible threats from mono-method bias (Podsakoff et al., 2003), we obtained data for one predictor variable from two separate sources (leaders and subordinates). However, future research might benefit from including multi-level data for all predictor variables from various subordinates. Second, the results point to the possible benefits of investigating the effects of target-specific transformational leadership on behaviors other than safety.

Implications

Support for the proposed model highlights two ways in which leaders might influence organizational greening activity. First, as hypothesized, environmentally-specific transformational leadership was associated with subordinates' harmonious passion for the environment, and indirectly associated with subordinates' workplace pro-environmental behaviors. Given that transformational leadership (e.g., Barling, Weber, & Kelloway, 1996; Dvir, Eden, Avolio, & Shamir, 2002) and safety-specific transformational leadership (e.g., Mullen & Kelloway, 2009) can be explicitly trained, leadership development initiatives might beneficially emphasize how leadership can be expressed to influence the greening of organizations. Second, leaders' workplace pro-environmental behaviors predicted employees' harmonious passion for the environment and workplace pro-environmental behaviors directly. Organizations might benefit from creating climates (e.g., organizational pro-environmental climate; Russell & Griffiths, 2008) that encourage and reward leaders (and employees) for enacting environmentally friendly behaviors.

In conclusion, this is the first study to develop and test a model linking environmentally-specific transformational leadership and subordinates' workplace pro-environmental behavior. The results identified the role of environmental descriptive norms in influencing leaders' environmentally-specific transformational leadership and their own workplace pro-environmental behaviors, and, in turn, leaders' role in understanding employees' harmonious passion for the environment and their workplace environmentally friendly behaviors. Kermit the Frog once said, "It's not easy being green." However, if the current findings are replicated across different samples with longitudinal data, organizational greening activity will be seen to be much easier than what Kermit feared; and significant implications concerning green leadership, workplace pro-environmental behaviors, and organizations' response to environmental sustainability issues will have been gained.

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Appendix A

Descriptive Norms Scale.

Please answer the following questions:

1. Do you know any family members and/or friends who work for an environmental organization (e.g. renewable energy organization, environmental consultants, the ministry of the environment, non-governmental environmental organization, etc.)?
2. Do your family members and/or friends practice environmentally friendly behaviors that you know about or have seen?

3. Do your family members and/or friends endorse environmentally friendly programs?
4. Do your co-workers practice environmentally friendly behaviors that you know about or have seen?
5. Do your co-workers endorse environmentally friendly programs?

Environmental Passion Scale

1. I am passionate about the environment.
2. I enjoy practicing environmentally friendly behaviors.
3. I enjoy engaging in environmentally friendly behaviors.
4. I take pride in helping the environment.
5. I enthusiastically discuss environmental issues with others.
6. I get pleasure from taking care of the environment.
7. I passionately encourage others to be more environmentally responsible.
8. I am a volunteered member of an environmental group.
9. I have voluntarily donated time or money to help the environment in some way.
10. I feel strongly about my environmental values.

Workplace Environmental-friendly Behavior Items

1. I print double sided whenever possible.
2. I put compostable items in the compost bin.
3. I put recyclable material (e.g. cans, paper, bottles, batteries) in the recycling bins.
4. I bring reusable eating utensils to work (e.g. travel coffee mug, water bottle, reusable containers, reusable cutlery).
5. I turn lights off when not in use.
6. I take part in environmentally friendly programs (e.g. bike/walk to work day, bring your own local lunch day).
7. I make suggestions about environmentally friendly practices to managers and/or environmental committees, in an effort to increase my organization's environmental performance.