

Article



# Fostering Employees' Voluntary Green Behavior: The Role of Environmentally Specific Servant Leadership, Positive Affectivity, and Workplace Anxiety

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**Abstract:** The recent introduction of servant leadership into the research on pro-environmental behavior in organizations has stimulated interest and concern among scholars on how an environmentally specific servant leader fosters their subordinates' green behavior. Drawing from affective event theory, this study focuses on the underlying affective mechanism linking environmentally specific servant leadership and employee voluntary green behavior. Using two-wave data from 190 employees in two organizations, we found that environmentally specific servant leadership was indirectly related to employee voluntary green behavior via positive affectivity. Moreover, workplace anxiety moderated the indirect effect, such that it was only significant and positive under low levels of workplace anxiety. Overall, our study sheds light on the role the effect plays in unpacking the influence of environmentally specific servant leadership on employee voluntary green behavior.

**Keywords:** employee green behavior; environmentally specific servant leadership; positive affectivity; workplace anxiety; affective event theory

# 1. Introduction

With the continuous deterioration of the ecological environment, as well as the depletion of natural resources, the issue of environmental sustainability arises as a universal concern [1,2]. Although global environmental organizations, as well as national agencies, have introduced various measures to deal with the environmental crisis, enterprises are considered a major contributor to environmental problems and are thus held accountable for dealing with them [3,4]. As corporate environmental responsibility has taken root in most societies around the world, enterprises are bound to face more environmental demands than in the past. To date, while most firms have included an environmental component in their strategic planning and formal policies, they still largely count on their employees' discretion and voluntary action to accomplish environmental objectives [5]. Therefore, a model of corporate green development that features the micro-foundations of environmental attitudes and behavior, is much needed [6].

Employees' green behavior is generally defined as the behavior taken by work professionals to minimize the negative impact on the environment or to have a positive impact on environmental protection in the workplace [7,8]. Discretionary in nature, this kind of behavior relies on employees' green-related initiatives that exceed the performance expectations of the organization [9,10]. Accordingly, employees' green behavior is more likely to be shaped by their immediate social environments (e.g., their leaders) rather than guided



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**Copyright:** © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). and restricted by the rules and regulations of their organizations [11]. Prior research has examined and reported associations of employee green behavior with various leadership variables such as environmentally specific transformational leadership [12,13], environmental leadership [14,15], the leader's own voluntary green behavior [11,16,17], etc. Among these leadership variables, one that has just received recent attention is environmentally specific servant leadership, which is an extension of servant leadership into the context of green management.

Servant leadership is defined as a practice of leadership that puts the interests of others over the leader's and focuses on their growth and development [18]. Servant leaders undertake ethical responsibility for the success of the organization, subordinates, customers, and other stakeholders [19]. Researchers have found that such characteristics as self-sacrifice and altruism possessed by servant leaders have an effect on the development of the green behavior of employees [20]. With this in mind, researchers have recently further expanded the domain of servant leadership to include green values and environmental leadership practices using the label "environmentally specific servant leadership" for such a construct [21–23]. At its core, environmentally specific servant leadership is a leadership style that aims at environmental concerns by offering subordinates green knowledge, skills, and training to help promote environmental values and activities [24–26]. Accordingly, environmentally specific servant leaders can be an important guarantee for the enterprise's green development [27]. They inspire employees' environmental behavior by acting as role models to instill environmental values; additionally, they respect the contributions of their subordinates to the environment [24]. While researchers have reported the relationships of environmentally specific servant leadership with employee green outcomes at work [25,28,29], less is known about the underlying mechanisms linking the two.

In addition, environmentally specific servant leadership is an important source of work events concerning environmental issues. According to affective event theory [30], work events are foundational social conditions that trigger individuals' emotional responses, which further influence their work attitudes and behavior. Previous studies on employee voluntary green behavior have mainly employed theoretical perspectives that tap into the cognitive process, such as the theory of planned behavior, social learning theory, social identity theory, and self-determination theory [17,24,31]. On the other hand, less was investigated from an affective perspective, particularly on the impact of leadership on employee green behavior. One exception is studies that link passion to certain leadership styles (e.g., spiritual leadership, environmentally specific transformational leadership) [10,32]. However, more research is needed to unpack the affective process in which leaders shape employee green behavior.

Recognizing this research deficiency, this paper attempts to explore the affective mechanism in which environmentally specific servant leadership stimulates employee green behavior. First, extending the literature on environmentally specific servant leadership, we theorize and empirically examine a mechanism explaining how environmentally specific servant leadership influences employee green behavior from an affective perspective. In the workplace, the leader's behavior shapes various emotional events that trigger the emotional responses of subordinates [33] and, subsequently, their green behavior. Yet, such an emotional lens departs from the dominant theoretical approach scholars have adopted in explaining the drivers of employee green behavior [8]. Specifically, based on affective event theory, we view environmentally specific servant leadership as an array of positive events to reveal the indirect effect of environmentally specific servant leadership on employee green behavior. Leaders as environmental servants bring positive affective experiences to employees via assisting employees to achieve environmental goals and shaping their environmental values, which in turn stimulate employee green behavior.

Affective event theory posits that individual traits play a vital boundary role in the activation, transmission, and subsequent influence of affective response [30]. In other words, individual differences can lead to differences in the emotional process triggered by workplace events. A potential individual emotional trait that may moderate the leadership-behavior relationship is workplace anxiety [34], which refers to feelings of tension, unease,

and nervousness about work-related performance [35]. It depends on the specific workplace context and individual differences [36]; that is, it is an individual disposition concerned about emotions. Physical and psychological symptoms of anxiety have been reported to impair employee performance and behaviors [36,37]. The current study proposes workplace anxiety as an emotion-related boundary condition. Although numerous studies suggest the impacts of workplace anxiety on organizational effectiveness [38], ethical behaviors [39], and job performance [40]. To our knowledge, very few examined workplace anxieties in the green management area. In this study, we propose that workplace anxiety moderates the extent to which employees respond to positive events triggered by environmentally specific servant leadership, which is another major contribution of this paper.

# 2. Literature Review and Hypotheses Development

#### 2.1. Environmentally Specific Servant Leadership and Employee Voluntary Green Behavior

It is well known that individual behavior in organizations is more likely to be shaped by those in higher positions. Likewise, the effective implementation of environmentally related initiatives by organizations depends on their leadership at all levels [10]. One line of research on leadership for environmental sustainability focuses on leaders' servant behaviors that may have a bearing on their subordinates' green behavior [20]. Benevolent and people-oriented, servant leadership is based on the leader's own morality and responsibility in respecting the dignity and value of their subordinates, focusing on their development, exploring and nurturing their abilities, fully motivating them, and putting their interests over the self-interest of the leader [41].

Given its focus on others and the nature of altruism, servant leadership is particularly useful in predicting pro-environmental orientation and practices [42]. Extending servant leadership theory to the environmental domain, researchers have developed an environment-focused construct of servant leadership. For instance, Robertson and Barling advocated extending the scope of servant leadership to green contexts and examining the impact of environmental-specific servant leadership on environmental outcomes [43]. Compared with general servant leadership, environmentally specific servant leadership shares some essential characteristics with original servant leadership, with both prioritizing the needs of subordinates [21]. On the other hand, environmentally specific servant leadership focuses on green management and inspiration to develop employees' environmental values and actions [24]. Specifically, it includes adopting environmentally friendly practices and providing subordinates with needed resources and behavior guidance to achieve environmental goals [25]. Recent scholarly work has found that environmentally specific servant leadership has a significant impact on green-related outcomes at the organizational level as well as at the individual level, such as organizational green performance [44], green employee behavior [45–47], green creativity [48], and so on.

Building on the literature and departing from the cognitive perspective that dominates previous investigations, this study draws on affective event theory to unpack the affective mechanism in which environmentally specific servant leadership leads to employee voluntary green behavior. Proposed by Weiss and Cropanzano, the theory represents the first multi-level model of emotion in the organization [30]. Briefly, the theory posits that there are positive or negative work events that occur in the workplace. Experiencing these events, employees produce affective reactions that, in turn, affect their work attitudes and behavior. Thus, employees' behavior and performance at work are not only determined by their capabilities, attitudes, and personalities but also by their affectivities [49,50]. Some existing research tends to support the theory. For example, Guenter, van Emmerik, and Schreurs found that delays in information exchange influenced interpersonal behavior from an affective events perspective [51]. Specifically, delays in the information exchange of coworkers provoked a negative effect on a focal employee, and this negative effect could not only translate directly into interpersonal counterproductive behavior but also into interpersonal withdrawal behavior via coworker satisfaction. Another study by Ashkanasy, Ayoko, and Jehn used affective event theory as a theoretical framework to illustrate that

open-plan office settings as an "affective event" triggered emotional reactions (e.g., anger and frustration) in employees, which subsequently led to negative work attitudes and behavior [52].

In a typical work setting, leaders serve as a salient work environment for employees in shaping their work attitudes and behavior. However, leaders' speeches and actions may stimulate employees' emotional responses first before changing their attitudes or behaviors. As specific situations or events in the workplace may be the main reason for the way people behave and perform at work [30], we argue that environmentally specific servant leadership stimulates distinctive "affective events". Environmentally specific servant leaders provide necessary resources (i.e., support, empowerment, and feedback) to their subordinates and do their utmost to encourage, serve, and help them in pursuit of green goals and contribution to green sustainability [22,23,53], which cultivate their pro-environmental values and evokes their positive affectivity. Aligned with these arguments, previous studies have reported that servant leaders can increase job satisfaction or life satisfaction [54,55], suggesting a positive impact of servant leadership on employee's effect and attitudes.

On the other hand, by paying attention to the personal needs of their subordinates, environmentally specific servant leaders are able to soothe employees in a timely manner. A key characteristic of environmentally specific servant leadership is their willingness to listen to their subordinates, to understand their needs and desires in relation to the environmental goals of the project, and to share their pain and frustration when the project fails to achieve these goals [56,57]. When employees are aware of their leaders' support and guidance in protecting and caring for their environment, they may feel a sense of meaningfulness and impact, and this perceived value can cause their positive emotional experience [58]. Hence, building on affective event theory, positive events generated by servant leaders trigger employees' positive affectivity as well as their pro-environmental behavior. Thus, we propose:

**Hypothesis 1.** *The relationship between environmentally specific servant leadership and employee voluntary green behavior is mediated by employee positive affectivity.* 

# 2.2. Workplace Anxiety as a Moderator

Workplace anxiety is a response to stressors at work in the form of tension symptoms [59], such as feelings of tension, unease, and nervousness about work-related performance [39,40]. Traditionally, research on anxiety has been mainly conducted in the realm of psychology and medicine, sometimes connected with work-related psychological health, sick leave, and so on [60,61]. Recently, workplace anxiety has been advocated by scholars in the field of organizational studies [40,62]. For example, Wang, Lin, and Jiang build a dual-process model based on social information processing, proposing that project leader workplace anxiety is indirectly related to project team member OCB via job frustration and career adaptability [37]. Further, workplace anxiety is distinct from general trait anxiety as the former is specific to the workplace and reflects an evaluation-based anxiety [40]. Additionally, workplace anxiety also differs from state-based anxiety in that it reflects a general feeling about work-related stress that manifests itself over time, as opposed to transient situation-specific features [63]. However, although numerous studies suggest that a high level of personal workplace anxiety has an impact on organizational effectiveness [38], ethical behaviors [39], and job performance [40], to our knowledge, few studies have introduced workplace anxiety as a moderator to predict employees' green behaviors.

Physical and psychological symptoms of anxiety were reported to impair employee performance and behaviors [36,37]. On the one hand, anxiety interferes with employees' ability to deal with immediate events [40]. Employees who suffer from workplace anxiety perceive that their current environment requires a great deal of effort (time or energy), in which case the individuals' attention is diverted from the task at hand [64,65]. As a result, even when environmentally specific servant leaders attend to and nurture these employees,

it may not result in their perceptions of positive events. Without the stimuli of positive events, it is not possible to elicit an internal emotional response from employees.

On the other hand, previous studies have pointed out that employees with high workplace anxiety perceive situations as threatening [39,66], which makes them more attentive to threat-related stimuli and less to positive events. In addition, employees with high workplace anxiety are more likely to experience increased emotional exhaustion [39,40]; they can hardly experience positive emotional responses to people and events [67]. Therefore, when an employee has a high level of workplace anxiety, it is difficult for them to have a positive emotional response to any positive events triggered by environmentally specific servant leadership. Thus, we hypothesize the following:

**Hypothesis 2.** Workplace anxiety moderates the relationship between environmentally specific servant leadership and employee positive affectivity. Specifically, environmentally specific servant leadership is positively related to employee positive affectivity when workplace anxiety is low, but not when workplace anxiety is high.

Integrating Hypotheses 1 and 2 implies a moderated mediation model, as illustrated in Figure 1. Affective event theory proposes that individual traits play a vital boundary role in the activation, transmission, and subsequent influence of emotional response [30]. Hence, we expect that workplace anxiety, as a special work-related personal trait, is likely to be a significant moderator for the indirect relationship between environmentally specific servant leadership and voluntary green behavior via positive affectivity. Accordingly, we propose the following hypothesis:



Figure 1. Conceptual framework.

**Hypothesis 3.** Workplace anxiety moderates the indirect and positive relationship between environmentally specific servant leadership and voluntary green behavior via employee positive affectivity, such that employee positive affectivity mediates the effects of environmentally specific servant leadership on employee voluntary green behavior when workplace anxiety is low, but not when workplace anxiety is high.

# 2.3. Proposed Conceptual Framework

Integrating all the hypotheses introduced earlier, we propose a theoretical model explicating how environmentally specific servant leadership fosters employee voluntary green behavior. The model links environmentally specific servant leadership and employee voluntary green behavior, with workplace anxiety as the moderator and positive affectivity as the mediator. Figure 1 is the proposed model.

# 3. Methods

# 3.1. Sample and Procedure

Our target population is companies that had adopted formal green policies, such that employees working in the companies have opportunities and discretion to engage in voluntary green behavior at work. Further, we also considered companies that directly engage in environmental business, as well as those that have impacts on the environment indirectly. In fact, with the promotion of environmental sustainability on a global level, most companies have engaged, to various degrees, in green management and environmental protection practices. Thus, we selected two companies as our sample—a wastewater treatment company and an engineering and construction company. Although each small in size, these two companies represent environmental and non-environmental businesses. Such a sampling approach, we hope, captures leadership effects on voluntary green behavior in companies that have set up their green policies. Note that in subsequent data analyses, we controlled for any company effects by including a company dummy.

To reduce common methods bias, we collected data in two waves [68]. In the first wave (T1), 240 full-time employees except for senior leaders in these two companies (110 from the engineering and construction firm and 130 from the wastewater treatment firm) were asked to report their direct supervisors' environmentally specific servant leadership and their own workplace anxiety, along with their demographic data (i.e., age, gender, and education). After removing invalid data, a total of 205 (85.42%) complete responses were returned from the two companies (99 from the engineering and construction firm and 106 from the wastewater treatment firm). In the second wave (T2), conducted two weeks after T1, employees who provided complete data in T1 were asked to fill out another survey on their positive affectivity and voluntary green behavior. In total, 190 (92.68%) employees responded with valid data, including 91 (91.92%) from the engineering and construction firm and 99 (93.40%) from the wastewater treatment firm. The final sample included 85 women and 105 men, with ages distributed into four categories: 20–29 years (37.37%), 30-39 years (46.84%), 40-49 years (13.16%), and 50-60 years (2.63%). As for education level, 16.84% were in college or below, 63.16% held a bachelor's degree or equivalent, and 20.00% had a master's degree or higher.

# 3.2. Measures

To ensure measurement reliability, the study used well-established scales. All the variables were measured on a seven-point scale (ranging from 1 = strongly disagree to 7 = strongly agree).

Environmentally specific servant leadership. We adopted Luu's 12-item measure of environmentally specific servant leadership [69]. A sample item was "My supervisor cares about my eco-initiatives" ( $\alpha = 0.978$ ).

Positive affectivity. Positive affectivity was assessed by a scale developed by Watson, Clark, and Tellegen [70]. Employees indicated the extent to which they experienced each descriptor (e.g., interested, enthusiastic, and proud) in general ( $\alpha = 0.930$ ).

Workplace anxiety. The workplace anxiety scale developed by McCarthy et al. was used for this study [40]. A sample item was "I am overwhelmed by thoughts of doing poorly at work" ( $\alpha = 0.924$ ).

Employee voluntary green behavior. Employees rated their voluntary green behavior using six items developed by Kim et al. [11]. Sample items included "Avoiding unnecessary printing to save papers" ( $\alpha = 0.907$ ).

Control Variables. We controlled for demographic effects such as gender (1 = female; 0 = male), age (1 = '20–29', 2 = '30–39', 3 = '40–49', and 4 = '50–59') and education level (1 = junior college or lower, 2 = bachelor's degree or equivalent, and 3 = master's degree or higher). And we also controlled for any company effects, including a company dummy (1 = the engineering and construction firm; 0 = the wastewater treatment firm).

#### 4. Results

#### 4.1. Measurement Reliability and Validity

Several analyses were conducted to validate measures before testing the hypotheses. First, we examined the discriminant validity of the measures. Because of our relatively small sample size and a large number of measurement items, we followed procedures recommended by Little, Cunningham, Shahar, and Widaman [71] and Bandalos [72] by creating parcels to achieve item-to-construct balance for all measures. Specifically, we

first combined the highest-loading and the lowest-loading items of each measure, then combined the second-highest-loading and second-lowest-loading items, and so on. In the end, we constructed six parcels for environmentally specific servant leadership, five parcels for positive affectivity, four parcels for workplace anxiety, and three parcels for employee green behavior. Based on the suggestions of Hu and Bentler [73], the predicted four-factor model achieved a satisfactory fit ( $\chi^2 = 256.885$ , df = 129; RMSEA = 0.072; CFI = 0.967; TLI = 0.961; SRMR = 0.046) than all alternative models as shown in Table 1, supporting the hypothesized four-factor model.

Table 1. Results of confirmatory factor analyses.

Model	<i>x</i> <sup>2</sup>	df	$\Delta\chi^2$ ( $\Delta$ df)	RMSEA	CFI	TLI	SRMR
Four-Factor Model (M0):	256.885	129		0.072	0.967	0.961	0.046
Three-Factor Model (M1): positive							
affectivity and employee voluntary green	564.456	132	307.571 *** (3)	0.132	0.888	0.871	0.089
behavior combined							
Two-Factor Model (M2): environmentally							
specific servant leadership, positive	1347 479	13/	1090 594 *** (5)	0 221	0.681	0.635	0 201
affectivity, and employee voluntary	1347.477	154	1070.074 (0)	0.221	0.001	0.000	0.201
green behavior combined							
One-Factor Model (M3): environmentally							
specific servant leadership, workplace							
anxiety, positive affectivity, and	2105.691	135	1848.806 *** (6)	0.278	0.492	0.424	0.249
employee voluntary green							
behavior combined							

N = 190; All models (M1, M2, and M3) compared with the four-factor model (M0). \*\*\* p < 0.001.

Then, we used self-reported surveys that are suitable to capture individual's perceptions, beliefs, judgments, and feelings [74]. We made efforts both procedurally and statistically to address the potential impact of common method bias. Procedurally, we collected data in two waves [68]. Statistically, we performed a covariance assessment using the variance inflation factor (VIF) technique, and all values were below a threshold of 2 (Table 2). We also conducted Harman's single-factor test [75], which showed that only 35.640% (less than 40%) of the common variance was accounted for by a single factor. In sum, these results suggest that common method variance was not a major issue. Moreover, the convergent validity was examined by factor loadings, average variance extracted (AVE), and composite reliability (CR). In Table 2, all the results of factor loadings reached the minimum value of 0.5. Meanwhile, the AVE was greater than 0.5, and the CR value was greater than 0.7, indicating a high degree of convergent validity.

Furthermore, we used Fornell and Larcker's approach to establish the discriminant validity of the constructs [76]. As shown in Table 3, for environmentally specific servant leadership, the AVE square root value is 0.876, which is greater than the maximum value of the absolute values of the correlation coefficient between factors (0.379). For workplace anxiety, the AVE square root value is 0.806, which is greater than the maximum value of the absolute values of the inter-factor correlation coefficient (0.173). For positive affectivity, the AVE square root value is 0.751, which is greater than the maximum value of the absolute values of the inter-factor correlation coefficient (0.526). For employee voluntary green behavior, the AVE square root value is 0.777, which is greater than the maximum value of the absolute values of the correlation coefficient between factors (0.526). All these results indicate that the variables have good discriminative validity.

# 4.2. Descriptive Statistics and Correlations

Descriptive statistics and bivariate correlations of the variables studied are reported in Table 4. As shown in the table, employee voluntary green behavior was correlated with company dummy, environmentally specific servant leadership, workplace anxiety, and positive affectivity. Positive affectivity was correlated with company dummy and environmentally specific servant leadership. Workplace anxiety was correlated with company dummy. Environmentally specific servant leadership was correlated with company dummy and Education. The significant positive correlations between employee voluntary green behavior, environmentally specific servant leadership, and positive affectivity provided some preliminary support for Hypotheses 1 and 2.

ESSL1         0.775           ESSL2         0.862           ESSL3         0.864           ESSL4         0.887           ESSL5         0.888           ESSL5         0.888           ESSL6         0.879           ESSL7         0.894           ESSL3         0.905           ESSL1         0.812           ESSL1         0.812           ESSL1         0.821           ESSL1         0.821           ESSL1         0.821           ESSL1         0.821           Workplace anxiety         WA1         0.692           WA2         0.790           WA3         0.799           WA4         0.809           WA5         0.820           WA6         0.820           WA6         0.821           PA1         0.615           PA2         0.709           PA3         0.789           PA4         0.751           PA5         0.799           PA6         0.797           PA6         0.797           PA7         0.756           PA9         0.797           PA10<	Construct	Items	Loadings	CR	AVE	VIF
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Environmentally specific servant leadership         ESSL4 ESSL5         0.887 0.888           ESSL5         0.888           ESSL7         0.894           ESSL9         0.905           ESSL10         0.912           ESSL10         0.842           ESSL11         0.882           ESSL12         0.842           Workplace anxiety         WA1         0.692           WA2         0.790           WA3         0.790           WA4         0.809           WA5         0.820           WA6         0.833           WA7         0.852           PA1         0.615           PA2         0.709           PA3         0.788           PA4         0.751           PA5         0.799           PA6         0.624           PA7         0.756           PA6         0.624           PA7         0.756           PA8         0.822           PA9         0.797           PA6         0.624           PA7         0.756           PA8         0.822           PA9         0.797           PA9 </td <td></td> <td>ESSL3</td> <td>0.864</td> <td></td> <td rowspan="3"></td> <td rowspan="3"></td>		ESSL3	0.864			
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		WA1	0.692			
		WA2	0.790			
Workplace anxiety         WA4 WA5         0.809 0.820         0.937         0.650         1.034           WA6         0.833         WA7         0.852         1.034         1.034           WA7         0.852         WA8         0.843         1.034         1.034           PA1         0.615         PA2         0.709         PA3         0.788         PA4         0.751           PA5         0.799         PA6         0.624         0.928         0.564         1.470           PA5         0.799         PA6         0.624         0.928         0.564         1.470           PA7         0.756         PA8         0.822         0.928         0.564         1.470           PA9         0.797         0.756         PA9         0.797         0.564         1.470           PA9         0.797         PA10         0.814         0.604         1.468           Employee voluntary green behavior         EVGB1         0.817         0.901         0.604         1.468           EVGB5         0.796         0.901         0.604         1.468         1.468		WA3	0.799			
Workplace arrively         WA5         0.820         0.937         0.650         1.034           WA6         0.833         WA7         0.852         WA8         0.843         WA7         0.852           WA8         0.843         WA8         0.843         WA8         0.843         WA8         0.928         0.564         1.034           Positive affectivity         PA1         0.615         0.709         0.788         0.788         0.928         0.564         1.470           PA5         0.799         0.756         0.799         0.928         0.564         1.470           PA7         0.756         PA8         0.822         0.928         0.564         1.470           PA9         0.797         0.756         PA8         0.822         0.94         1.470           PA9         0.797         0.756         PA8         0.822         0.901         0.604         1.468           Employee voluntary green behavior         EVGB1         0.817         0.901         0.604         1.468           EVGB5         0.796         EVGB6         0.752         0.901         0.604         1.468	Workplace anviety	WA4	0.809	0.007	0 (50	1 024
WA6         0.833           WA7         0.852           WA8         0.843           PA1         0.615           PA2         0.709           PA3         0.788           PA4         0.751           PA5         0.799           PA6         0.624           PA7         0.756           PA8         0.822           PA9         0.797           PA10         0.814           Employee voluntary green behavior         EVGB1         0.817           EVGB2         0.809           EVGB3         0.722           EVGB4         0.764           EVGB5         0.796           EVGB6         0.752	workplace anxiety	WA5	0.820	0.937	0.650	1.034
WA7         0.852           WA8         0.843           PA1         0.615           PA2         0.709           PA3         0.788           PA4         0.751           PA5         0.799           PA6         0.624           PA7         0.756           PA8         0.822           PA9         0.797           PA10         0.814           Employee voluntary green behavior         EVGB1         0.817           EVGB3         0.722         0.901         0.604           EVGB4         0.764         0.901         0.604           EVGB5         0.796         0.901         0.604		WA6	0.833			
WA8         0.843           PA1         0.615           PA2         0.709           PA3         0.788           PA4         0.751           PA5         0.799           PA6         0.624           PA7         0.756           PA8         0.822           PA9         0.797           PA10         0.814           Employee voluntary green behavior         EVGB1         0.817           EVGB3         0.722         0.901         0.604         1.468           EVGB5         0.796         0.901         0.604         1.468		WA7	0.852			
PA1         0.615           PA2         0.709           PA3         0.788           PA4         0.751           PA5         0.799           PA6         0.624           PA7         0.756           PA8         0.822           PA9         0.797           PA10         0.814           Employee voluntary         EVGB1         0.817           EVGB2         0.809           EVGB3         0.722           PKGB5         0.796           EVGB5         0.796		WA8	0.843			
Positive affectivity         PA2         0.709           PA3         0.788           PA4         0.751           PA5         0.799           PA6         0.624           PA7         0.756           PA8         0.822           PA9         0.797           PA10         0.814           Employee voluntary         EVGB1         0.817           EVGB2         0.809           EVGB3         0.722           PK085         0.796		PA1	0.615			
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Positive affectivity         PA4         0.751         PA5         0.799         0.928         0.564         1.470           PA6         0.624         0.756         0.756         0.756         0.756         0.797         0.797         0.797         0.797         0.797         0.797         0.797         0.797         0.814         0.814         0.817         0.809         0.702         0.901         0.604         1.468           Employee voluntary green behavior         EVGB3         0.722         0.901         0.604         1.468           EVGB5         0.796         EVGB6         0.752         0.901         0.604         1.468		PA3	0.788			
Positive affectivity         PA5         0.799         0.928         0.564         1.470           PA6         0.624         0.928         0.564         1.470           PA7         0.756         0.756         0.822         0.928         0.564         1.470           PA7         0.756         0.797         0.797         0.797         0.797         0.814         0.814           Employee voluntary         EVGB1         0.817         0.901         0.604         1.468           EVGB2         0.809         0.722         0.901         0.604         1.468           EVGB3         0.722         0.901         0.604         1.468           EVGB5         0.796         0.796         0.604         1.468		PA4	0.751			
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PA8       0.822         PA9       0.797         PA10       0.814         EwGB1       0.817         EVGB2       0.809         EVGB3       0.722         EVGB5       0.796         EVGB6       0.752		PA7	0.756			
PA9       0.797         PA10       0.814         EVGB1       0.817         EVGB2       0.809         EVGB3       0.722         EVGB5       0.796         EVGB6       0.752		PA8	0.822			
PA10       0.814         EVGB1       0.817         EVGB2       0.809         EVGB3       0.722         EVGB4       0.764         EVGB5       0.796         EVGB6       0.752		PA9	0.797			
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Ewployee voluntary         EVGB2         0.809           green behavior         EVGB3         0.722           EVGB4         0.764         0.901         0.604         1.468           EVGB5         0.796         EVGB6         0.752		EVGB1	0.817			
Employee voluntary         EVGB3         0.722           green behavior         EVGB4         0.764         0.901         0.604         1.468           EVGB5         0.796         EVGB6         0.752         0.752		EVGB2	0.809			
green behavior EVGB4 0.764 0.901 0.004 1.468 EVGB5 0.796 EVGB6 0.752	Employee voluntary	EVGB3	0.722	0.001	0.604	1 160
EVGB5 0.796 EVGB6 0.752	green behavior	EVGB4	0.764	0.764 0.901 0.604 0.796		1.468
EVGB6 0.752		EVGB5	0.796			
		EVGB6	0.752			

Table 2. Results of the measurement model.

Table 3. Discriminant validity: Pearson correlation and AVE square root value.

	ESSL	WA	PA	EVGB
Environmentally specific servant leadership (ESSL)	0.876			
Workplace anxiety (WA)	0.109	0.806		
Positive affectivity (PA)	0.379	0.079	0.751	
Employee voluntary green behavior (EVGB)	0.355	0.173	0.526	0.777

Note: Diagonal numbers are AVE square root values.

		Mean	SD	1	2	3	4	5	6	7
1	Company	0.480	0.501							
2	Gender	0.553	0.499	0.227 **						
3	Age	1.811	0.760	0.087	0.026					
4	Education	2.032	0.608	0.141	-0.093	0.196 **				
5	Environmentally Specific Servant Leadership	5.203	1.283	0.338 ***	0.015	0.135	0.200 **			
6	Workplace Anxiety	4.670	1.267	0.185 *	0.112	0.080	0.053	0.109		
7	Positive Affectivity Employee	4.856	0.895	0.244 ***	0.010	-0.131	-0.056	0.379 ***	0.079	
8	Voluntary Green Behavior	5.533	1.002	0.209 **	-0.067	-0.029	-0.012	0.355 ***	0.173 *	0.526 ***

Table 4. Means, standard deviations, and correlations among study variables.

Note: N = 190. \*\*\* *p* < 0.001, \*\* *p* < 0.01, \* *p* < 0.05.

#### 4.3. Mediation Analysis

To test Hypothesis 1, we conducted a mediation test using PROCESS model 4 in SPSS, proposed by Hayes [77]. As shown in Table 5, the total effect of environmentally specific servant leadership on employee voluntary green behavior was significant [95% CI: (0.151, 0.376)]. After adding employee positive affectivity as a mediator, the direct effect of environmentally specific servant leadership on employee voluntary green behavior was significant [95% CI: (0.025, 0.243)], and the indirect effect of environmentally specific servant leadership on employee positive affectivity was also significant [95% CI: (0.063, 0.210)]. These results indicated that employee positive affectivity partially mediated the relationship between environmentally specific servant leadership to employee voluntary green behavior. Therefore, Hypothesis 1 was supported.

Table 5. Results of mediation analysis.

ESSL-PA-EVGB	Estimate	Boot SE	95% BC Bootstrapped CI [LL, UL]	Result
Total Effects	0.264	0.057	[0.151, 0.376]	Significant
Direct Effects	0.134	0.055	[0.025, 0.243]	Significant
Indirect Effect	0.130	0.038	[0.063, 0.210]	Significant

Note: N = 190; Bootstrap = 5000. ESSL = Environmentally Specific Servant Leadership; PA = Positive Affectivity; EVGB = Employee Voluntary Green Behavior.

# 4.4. Moderation Analysis

We used hierarchical regression analysis to test the moderating role of workplace anxiety. First, we mean-centered the independent and moderating variables for moderated regression analyses. And then we entered four control variables (i.e., company, age, gender, and education), two independent variables (i.e., environmentally specific servant leadership and workplace anxiety), and an interaction between environmentally specific servant leadership and workplace anxiety into the model in separate steps. As can be seen from Model 1 to 4 in Table 6, after controlling for demographic variables and main effects, the interaction term of environmentally specific servant leadership × workplace anxiety was negative and significant in predicting employee positive affectivity (b = -0.106, *p* < 0.01). Figure 2 illustrates the pattern of the interaction, with low (-1SD) and high (+1SD) levels of workplace anxiety, respectively [78]. As predicted, for the relationship between environmentally specific servant leadership and employee positive affectivity, the slope was positive and significant for employees who were low in workplace anxiety (simple slopes:  $\beta = 0.353$ , p < 0.001) but non-significant for employees who were high in workplace anxiety (simple slopes:  $\beta = 0.085$ , p > 0.1). Thus, Hypothesis 2 was supported.

**Table 6.** Hierarchical regression results of environmentally specific servant leadership on positive affectivity moderated by workplace anxiety.

	Positive Affectivity				
	Model 1	Model 2	Model 3	Model 4	
Step 1: Control variables					
Company	0.498 ***	0.282 *	0.273 *	0.327 *	
Age	-0.164	-0.200 *	-0.202 *	-0.200 *	
Gender	-0.101	-0.069	-0.074	-0.108	
Education	-0.108	-0.181	-0.182	-0.195	
Step 2: Main effects					
Environmentally specific servant leadership (ESSL)		0.260 ***	0.259 ***	0.219 ***	
Step 3: Main effects					
Workplace Anxiety (WA)			0.025	0.064	
Step 4: Moderating effects					
ESSL X WA				-0.106 **	
R <sup>2</sup> change <sup>a</sup>		119	0.120	0.159	
$\mathbb{R}^2$	0.090	0.209	0.210	0.249	
Adj R <sup>2</sup>	0.070	0.187	0.184	0.220	
Overall F	4.550 **	9.710 ***	8.105 ***	8.607 ***	

Note: Environmentally specific servant leadership and Workplace Anxiety were mean-centered for all analyses. <sup>a</sup> The values of  $\mathbb{R}^2$  change for Model 2, 3, and 4 result from comparisons with Model 1. \*\*\* p < 0.001, \*\* p < 0.01, \* p < 0.05.



**Figure 2.** Workplace anxiety as a moderator of the relationship between environmentally specific servant leadership on employee positive affectivity.

# 4.5. Moderated Mediation Analysis

We examined the moderated mediation effect using PROCESS model 7 in SPSS proposed by Hayes [77]. Table 7 showed the index of moderated mediation effect, and Table 8 showed the conditional indirect effect of environmentally specific servant leadership on employee voluntary green behavior at specific levels of workplace anxiety. Specifically, the conditional indirect effect of environmentally specific servant leadership on employee voluntary green behavior via employee positive affectivity was significantly moderated by workplace anxiety (Table 7: index of moderated mediation = -0.053, bootstrapping 95% CI [-0.095, -0.018]). More importantly, the indirect effect of environmentally specific servant leadership on employee voluntary green behavior was significant for employees.

who were low in workplace anxiety (Table 8: estimate = 0.176, 95% CI = [0.094, 0.272]) but not for employees who were high in workplace anxiety (Table 8: estimate = 0.042, 95% CI = [-0.030, 0.117]). Since the confidence interval for indirect effects did not include zero, Hypothesis 3 was supported. The Johnson–Neyman graph in Figure 3 illustrated that the indirect effect of environmentally specific servant leadership on employee voluntary green behavior via employee positive affectivity was strongest when workplace anxiety was at its lowest level, and it is also known from the figure that the moderating relationship was significant when the employee's workplace anxiety was below a critical value (the confidence interval did not include zero).

Table 7. Indices of moderated mediation.

			95% Confidence Interval		
	Index	Boot SE	Lower Level	Upper Level	
Environmentally Specific Servant Leadership—Positive Affectivity—Employee Voluntary Green Behavior	-0.053	0.019	-0.095	-0.018	
Note: N = 190: Bootst	rap = 5000				

Note: N = 190; bootstrap = 5000.

**Table 8.** Conditional indirect effect of environmentally specific servant leadership—voluntary green behavior link at specific levels of workplace anxiety.

Workplace Anxiety	Boot Indirect	Dest CE	95% Confidence Interval			
	Effect	Boot SE	Lower Level	Upper Level		
-1SD	0.176	0.045	0.094	0.272		
Mean	0.109	0.033	0.049	0.179		
+1SD	0.042	0.036	-0.030	0.117		



Note: N = 190; Bootstrap = 5000.

**Figure 3.** Johnson–Neyman plot of indirect effect of environmentally specific servant leadership on employee voluntary green behavior via positive affectivity. The solid line represents the regression line, and the dashed line represents the 95% confidence interval.

Finally, we also assessed t-values and path coefficients to confirm the moderated mediation effect reported by the PROCESS procedure. Based on all the results reported earlier and those in Figure 4, it can be concluded that all the hypotheses were supported.



β=0.134; t=2.419\*

**Figure 4.** Examination of moderated mediation of environmentally specific servant leadership on employee voluntary green behavior via positive affectivity: standardized path coefficients. \*\*\* p < 0.001, \*\* p < 0.01, \* p < 0.05.

#### 5. Discussion

Environmental sustainability is one of the most critical topics of current society. Drawing upon affective event theory, this study developed a theoretical model explicating how environmentally specific servant leadership fosters employee voluntary green behavior. Specifically, we proposed that the relationship between environmentally specific servant leadership and employee voluntary green behavior would be mediated by employee positive affectivity, and workplace anxiety would moderate the first-stage path.

Analysis of two waves of data from 190 employees in two companies revealed that environmentally specific servant leadership directly and indirectly affected employee green behavior. Specifically, positive affectivity mediated the positive relationship between environmentally specific servant leadership and employee green behavior. Moreover, workplace anxiety moderated the relationship between environmentally specific servant leadership and employees' positive affectivity and thus also moderated the indirect relationship between environmentally specific servant leadership and green behavior via employee positive affectivity. Employee positive affectivity mediated the indirect effects when workplace anxiety was low but not when workplace anxiety was high. In summary, these findings support the value of servant leadership in promoting employee green behavior for a more sustainable, eco-friendly workplace.

This research provided valuable theoretical insights into the extant literature in various ways. Prior research has examined an array of antecedents of employee green behavior [8,79], among which different types of leadership were shown to facilitate the nurturing of employee green behaviors, including environmentally specific transformational leadership [10,12,13], environmental leadership [14,15], and ethically oriented leadership [80,81]. Relatively few have examined the relationship between environmentally specific servant leadership and employee green behavior. Our study adds to the literature by linking environmentally specific servant leadership with employee green behavior and reporting a positive direct effect [12,25,53].

Nonetheless, the main contribution of this study is explicating the affective process in which environmentally specific servant leadership fosters employee green behavior. Norton et al. reviewed the literature on employee green behavior and identified four distinct theoretical approaches to explaining the impact of employee green behavior: (1) attitudinal, (2) normative, (3) exchange, and (4) motivational [8]. In this study, we offered an additional emotional lens to unpack the impact of environmentally specific servant leadership on employee green behavior. From this lens, certain leader behaviors can evoke emotional responses from subordinates, which in turn influence individual behavior. Adopting affective event theory as an organizing framework, our study revealed positive affect as a link-pin between environmentally specific servant leadership and employee voluntary green behavior. We found that leaders with environmentally specific servant characteristics bring a positive affective experience to employees via assisting employees to achieve environmental goals, shaping their environmental values, and then stimulating their green

behavior via this positive affectivity. These findings are consistent with and well supported by affective event theory. By conceptualizing environmentally specific servant leader behaviors as an array of workplace events that generate employees' positive emotions, we advance the literature by introducing affective event theory into the context of green leadership and behavior in organizations.

In addition to the main effect, we also explored the moderating role of workplace anxiety. Originating from the fields of psychology and medicine, workplace anxiety is now increasingly being studied by scholars in organizational management. In fact, workplace anxiety has a significant impact on both employees and organizations. However, some of the research conducted on workplace anxiety was qualitative and from a theoretical perspective. For example, Cheng and McCarthy constructed a multi-level, multi-process model of workplace anxiety via 19 theoretical propositions that highlight the processes and conditions by which workplace anxiety may lead to diminished and facilitated performance [39]. Among the few empirical studies, the consequences of work anxiety are mainly the focus. Research has shown that high levels of individual workplace anxiety have a negative impact on organizational effectiveness [35], ethical behavior [38], and job performance [40]. According to affective event theory, individual traits serve as a boundary role in the activation, transmission, and subsequent influence of emotional response [30]. Essentially, workplace anxiety is an emotionally relevant individual differences variable that can lead to differences in the emotional responses triggered by events [39]. The significant effects of leadership found only with the low level of workplace anxiety point to the need to include emotionally relevant traits when seeking to understand the contextual influence on individual affect and the resulting behavior.

#### 5.1. Practical Implications

Companies are increasingly being asked to improve their environmental performance and take on more corporate social responsibility [8,11]. Corresponding to this call, our research provides several managerial implications for organizations and managers to facilitate employee voluntary green behavior. Firstly, this study reinforces the importance of environmentally specific servant leadership. The findings show that environmentally specific servant behaviors by leaders can produce a positive effect on employees, which in turn leads to an increase in their voluntary green behavior. While selecting managers, preference should be given to individuals who can demonstrate environmentally specific servant behaviors. In addition, organizations can provide training and development opportunities for their managers to improve these behaviors. Environmentally specific servant leadership focuses on facilitating and nurturing the creation of green values of their subordinates [23–25]. By engaging in positive, green-related interactions with their subordinates, these leaders can increase their subordinates' positive emotions and green behavior.

Moreover, the fact that the instrumental value of environmentally specific servant leadership only manifests itself under the low level of workplace anxiety reveals a need to manage such a personal chronic emotional state. For instance, a meta-analysis by Martin et al. revealed that health promotion intervention in the workplace decreased employee depression and anxiety [62]. Organizations therefore need to look after the physical health of their employees by offering various training programs. In addition, the workplace environment plays a significant role in shaping employees' anxiety levels [82]. Reasonable distribution of work tasks, increased autonomy at work, a healthy work climate, and other initiatives can all help to reduce workplace anxiety among employees. In doing so, organizations can leverage the full potential of environmentally specific servant leadership in promoting green behavior among employees.

# 5.2. Limitations and Future Research Directions

Although we have achieved some valuable findings, there are several limitations remaining in our study. First, we used employees' self-reports when measuring their voluntary green behavior, which can lead to upward bias, albeit that self-report measurement is

no more biased than supervisor reports [83]. We suggested that future research collect data from multiple sources in order to obtain more reliable measures. Second, cross-sectional designs are not fully effective in providing causal inferences. We attempted to minimize this limitation by collecting data in two waves at different times. However, we recommend that scholars conduct a longitudinal investigation. Third, in addition to individual-level affective processes leading to employee green behavior, how leadership fosters green behavior via team-level affective processes and mechanisms remains a less well trodden-area that needs more research attention. As most of the work is organized and achieved by a team-based structure, we strongly encourage scholars to tackle this challenge and unpack team dynamics in the context of environmental leadership and sustainability. Additionally, our data were collected from one environmental company and one non-environmental company. There may be potential differential effects of leadership on voluntary green behavior in environmental versus non-environmental companies. Researchers could further investigate to what extent these differences are and how business contexts shape the way leaders influence the green behaviors of their subordinates. Last but not least, this study collected data from a single country-China. In order to increase the generality of our findings, future researchers could collect data from employees working in different countries, as research has shown cross-cultural differences in employees' environmental beliefs and attitudes [84] and voluntary green behavior [16].

# 6. Conclusions

In conclusion, this study provides evidence about the importance of environmentally specific servant leadership to organizations' green management. First, we advanced knowledge about the relationship of environmentally specific servant leadership to employee voluntary green behavior. The main contribution of the paper is to explicate the mechanism for such a link based on affective event theory, identifying positive affectivity as the mediator and workplace anxiety as the moderator.

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