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Let leaders permit nature! Role of employee engagement, environmental values, and sustainable behavioral intentions

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Abstract

The current study examines the relationship between authentic leadership and sustainable behavior intention among employees. We also tested employee engagement as a mediator and environmental value as a boundary condition in Danish manufacturing firms. The data from 346 respondents were obtained using time-lagged and multi-respondent techniques, and the data were analyzed using structural equation modeling. The results revealed that authentic leadership directly impacts sustainable behavior intentions whereas cognitive and behavioral employee engagement mediates the relationship between authentic leadership and sustainable behavioral intentions. Additionally, environmental values strengthen the positive relationship between employee engagement's cognitive and behavioral dimensions and sustainable behavioral intentions. This study advances the social exchange theory by empirically testing the beneficial effects of authentic leadership and employee engagement on the intention to engage in sustainable behavior. We also propose that practitioners emphasize authentic leadership as it can foster employees' environmental values and sustainable behavior intentions that are helpful for the organization's and society's sustainability.

KEYWORDS

authentic leadership, employee engagement, environmental values, social exchange theory, sustainable behavior intention

1 | INTRODUCTION

Organizations are increasingly compelled to engage in sustainable practices and uphold social responsibility in today's dynamic and complex business environment. This mounting pressure reflects the growing awareness and expectations surrounding responsible business conduct (Nwagbara & Reid, 2013; Tien et al., 2020). An ever-increasing understanding of environmental problems, social issues, and the long-term viability of businesses drives this shift toward sustainability (Vuong et al., 2021). Organizations are expected to align

their practices and behaviors with these principles, as society becomes more aware of the effects of human activity on the planet and acknowledges the need for sustainable development (He & Harris, 2020) through their leaders (Ishaq et al., 2024).

Leadership is pivotal in shaping organizational culture values and adopting sustainable practices (Roscoe et al., 2019). The attitudes and behaviors of employees and the organization's overall direction and strategic choices are significantly impacted by the actions and behaviors of leaders (Etse et al., 2022). Leaders must adopt behaviors that promote sustainability as organizations work to become more

Abbreviations: AL, authentic leadership; BE, behavioral engagement; CE, cognitive engagement; CFA, confirmatory factor analysis; CFI, Comparative Fit Index; EE, emotional engagement; EFA, exploratory factor analysis; EV, environmental values; KMO, Kaiser–Meyer–Olkin; RMR, root mean square residual; SBI, sustainable behavior intention; SET, Social Exchange Theory.

sustainable (Tan et al., 2020). Authentic leadership has emerged as a leadership approach that holds promise in driving sustainable behavior within organizations (Avolio & Gardner, 2005). Self-awareness, transparency, moral decision-making, and strong interpersonal relationships are key components of authentic leadership (Walumbwa et al., 2008), inspiring leaders to be sincere, truthful, and loyal to their principles. Authentic leaders foster a culture of trust, openness, and employee wellbeing by exhibiting these traits (Men & Stacks, 2014).

Although prior studies have provided valuable insights into the impact of authentic leadership on various employee outcomes such as job satisfaction, organizational commitment, and employee engagement (cf. Aftab et al., 2023), there remains a significant gap in understanding its specific influence on the intention to engage in sustainable behavior. Limited knowledge exists regarding the direct relationship between authentic leadership and sustainable behavior among individuals in organizational settings (Hadian Nasab & Afshari, 2019; Kiersch & Byrne, 2015). The desire and commitment of people to use sustainable practices at work are referred to as sustainable behavior intention (Kim et al., 2024). It includes promoting social responsibility, reducing waste, and using environmentally friendly methods (Javed et al., 2020).

To date, extensive research has been conducted on leadership styles such as transformational leadership (Balwant et al., 2020), transactional leadership, and leader-member exchange (Thanh & Quang, 2022) with employee engagement, but authentic leadership's association with employee engagement dimensions and sustainable employee behavior has been rarely investigated. Considering these caveats, this study examines the impact of authentic leadership on employee engagement and sustainable behavioral intentions in Danish manufacturing industries. Since authentic leadership promotes proactive behaviors, we proposed that authentic leadership will strongly impact employee engagement dimensions and sustainable behavioral intentions. Additionally, we aim to examine the moderating effect of environmental values on the relationship between authentic leadership and sustainable behavior intention. Environmental values reflect individuals' beliefs and attitudes toward environmental sustainability (Ojo et al., 2019). These values play a significant role in shaping individuals' perceptions and behaviors toward sustainable practices.

This study has several implications for researchers and practitioners. This study develops a comprehensive framework for theory to examine how authentic leadership behaviors influence employees' sustainable behavior intention using social exchange theory (SET). This study adds to authentic leadership and sustainability knowledge by reviewing this connection and offers useful future research recommendations to explore sustainable practices. For managerial implications, understanding the connection between authentic leadership and sustainable behavior intention is crucial for organizations looking to foster a sustainable culture and actively motivate their staff to engage in sustainable practices. Therefore, this study suggests leadership development initiatives and environmentally friendly business practices as practical insights for organizations to promote sustainable behavior among their workforces.

2 | LITERATURE REVIEW

2.1 | Authentic leadership

Authentic leadership is a prominent strategy that has attracted significant attention recently. It refers to a concept that combines constructive psychological abilities with a helpful organizational environment, resulting in increased self-awareness and self-regulated positive behaviors among leaders and associates, ultimately fostering their positive development (Zheng et al., 2022). It emphasizes the importance of leaders being authentic, self-aware, and transparent in their interactions with others. Authentic leadership benefits both individuals and companies in several ways, including increased job satisfaction, higher levels of employee engagement, and better overall organizational success (Wang & Hsieh, 2013). The literature found four dimensions of authentic leadership: self-awareness, relational transparency, internalized moral perspective, and balanced processing (Gardner et al., 2021).

Self-awareness, the first dimension, involves understanding one's ideals, strengths, emotions, and weaknesses (Carden et al., 2022). Leaders with high self-awareness are well connected with their inner selves and are conscious of how their actions affect others (Purwanto et al., 2021). Leaders can act authentically, make better decisions, and gain the trust of their followers by being self-aware (Gómez-Leal et al., 2022). The second dimension is relational transparency, which refers to the open and honest communication between leaders and followers (Rego et al., 2022). Authentic leaders are forthright in communicating, sharing pertinent information, giving direct feedback, promoting open communication, and being approachable. Transparency in relationships encourages respect and trust, fostering a cooperative and supportive work environment that enables followers to experience value and participation in decision-making (Barrane et al., 2021).

Internalized moral perspective is another crucial aspect of authentic leadership, which involves having strong moral convictions and ethical standards that direct one's behavior (Peng & Wei, 2020). When faced with difficult circumstances, authentic leaders commit to doing what is right and operate with integrity. Making moral decisions is given priority, and they take responsibility for their actions (Cervantes et al., 2020). Leaders inspire trust and set an excellent example for their followers by exhibiting an internalized moral perspective and encouraging ethical behavior throughout the organization. Lastly, balanced processing is the ability of leaders to consider many points of view and evaluate data with objectivity (Purwanto et al., 2021). This dimension proposed that authentic leaders are open-minded, value different points of view, seek feedback from others, and make decisions without bias, acting reasonably and without prejudice (Singh et al., 2020). Balanced processing fosters an inclusive and participatory workplace where everyone's ideas are valued, which promotes collaboration and innovation (Abid, Dowling, et al., 2023).

2.2 | Employee engagement

In organizational research and practice, employee engagement has become necessary as an “active, work-related positive psychological state operationalized by the intensity and direction of cognitive, emotional, and behavioral energy” (Kwon & Kim, 2020). It reflects the degree of commitment, motivation, and connection workers have to their work. It is strongly associated with several favorable outcomes, including job satisfaction, performance, organizational commitment, and worker wellbeing (Shazadi et al., 2022). Employee engagement is a dynamic and multifaceted concept that includes cognitive, behavioral, and emotional engagement (El-Sayad et al., 2021; Gupta & Sharma, 2016). Cognitive engagement describes the psychological state in which workers are mentally engrossed in their work tasks and derive meaning and significance from them (Huang et al., 2022). This type of engagement is linked with how focused, attentive, and immersed employees are in their work-related thoughts (Rich et al., 2010). Cognitively engaged employees report higher levels of job satisfaction and performance because they feel challenged, autonomous, and in control of their work (Shuck et al., 2014). They are driven to seek opportunities for ongoing learning and development and investigate novel solutions to problems (Huang et al., 2022).

The second dimension is emotional engagement, which captures the affective aspect of employees' experiences at work (Ulmanen et al., 2016). It alludes to workers' sentimental ties and attachments to their jobs, coworkers, and organizations (Shuck et al., 2017). Positive feelings related to their work, such as zeal, pride, and joy, are experienced by emotionally engaged employees. They have a sense of loyalty and belonging to their company, promoting a friendly and productive work environment (Huang et al., 2022). Behavioral engagement, the last dimension of employee engagement, refers to the outward-facing and proactive facets that describe how much an employee goes above and beyond what is required of them in their job description and actively contributes to the success of the company (Park et al., 2021) (Macey & Schneider, 2008). Behaviorally engaged employees take the initiative to take on new responsibilities, show initiative, and are eager to participate in organizational activities and initiatives (Duthler & Dhanesh, 2018). They have a drive to produce excellent work, offer outstanding customer service, and support a positive workplace culture (Do et al., 2019; Letheren et al., 2019).

2.3 | Environmental values

Environmental behavior is closely related to how people feel about the environment and their cultural background (Kollmuss & Agyeman, 2002). Understanding environmental values can help us to understand how people view and engage with nature (Chawla, 2020). Values are indicators of emotional characteristics and serve as descriptors of viewpoints and responses to the environment. Steg and de Groot (2012) define values as “desirable goals that serve as guiding principles in people's life,” highlighting their significance as fundamental guiding forces in human decision-making. Values are not isolated

elements but rather intricate constructs that can simultaneously influence multiple aspects of an individual's beliefs, attitudes, norms, and behaviors (Zhang et al., 2020). They determine the focus of one's attention, affect the accessibility of certain knowledge, impact the evaluation of various situational aspects, and influence the consideration of alternatives, ultimately shaping actual behavior. Moreover, values are not uniform across individuals; while different people may endorse similar values, they often prioritize them differently. This divergence in prioritization leads to variations in preferences, beliefs, attitudes, norms, and decision-making processes.

Understanding behaviors connected to environmental conservation and sustainability has benefited from this approach based on personal norms, moral commitment, and compassion (Esfandiar et al., 2020). The key to analyzing environmental values is Schwartz's dual-dimensional framework. The values range from self-improvement (self-interest) to self-transcendence (altruism) and from openness to change to conservative ideals (Tabernero et al., 2020). Studies have shown links between specific environmental behaviors and ideals represented by this framework (Lange & Dewitte, 2019). Ishaq et al. (2024) used these factors to predict various behaviors, emphasizing the impact of values on environmental behaviors. However, the influence of values on actions differs across multiple situations and actions. Environmental beliefs are examined in the study of environmental concern because they are thought to result from logical cost-benefit calculations obtained from environmental behavior.

The perspective on social dilemmas describes how people choose between egoistic and altruistic incentives when participating in cooperative behaviors. According to Peng et al. (2021), having a thorough knowledge of environmental difficulties and their long-term effects encourages cooperative behavior. To predict environmental behavior, it is essential to consider the relationship between individual values and contextual factors (Ahmad et al., 2020). An intensified degree of environmental behavior may result from the interactions between these components. However, it has been shown that when intermediate constructions are not evaluated, the values lose some explanatory power (Schraff, 2021). Therefore, environmental values influence people's views of and behavior toward sustainable practices. It has been suggested that harmony between a person's personality and the circumstances in which they find themselves promotes better environmental behavior by providing insights into the complexity of environmental behaviors. This study emphasizes the need to consider personal beliefs and environmental factors when comprehending and encouraging sustainable behavior.

2.4 | Sustainable behavior intention

In today's global business landscape, the importance of sustainability and environmentally responsible practices has become increasingly apparent (Li et al., 2020). Due to the growing awareness of environmental problems, social issues, and the long-term viability of businesses, organizations are under increasing pressure to operate socially, responsibly, and sustainably (Yong et al., 2020). To encourage

sustainable practices within organizations, the concept of sustainable behavior intention has attracted much attention (Saeed et al., 2019). Individuals' propensity and dedication to using environmentally and socially responsible business practices are called sustainable behavior intention (Al-Ghazali & Afsar, 2021; Vătămănescu et al., 2021).

Numerous studies have investigated the factors that influence sustainable behavior intention, highlighting the significance of individual and organizational factors (Chaudhary, 2021; Cop et al., 2020). Sustainable behavior intention has been positively influenced by environmental awareness, including people's knowledge and understanding of environmental issues (Abid, Ceci, et al., 2023; Severo et al., 2021). The employees are more likely to demonstrate a stronger intention to engage in sustainable practices when they are more conscious of the significance of their actions in promoting sustainability (Ishaq et al., 2024). Similarly, higher levels of sustainable behavior intention are linked to positive attitudes and values toward sustainability, such as an interest in the environment and a conviction in the value of sustainable practices (Li et al., 2020).

Organizational-level factors also significantly impact sustainable behavior intention (Isensee et al., 2020). The organizational culture, defined by shared values, beliefs, and norms, is crucial in determining how motivated people are to adopt sustainable behaviors (Smircich, 2017). When an organization has a strong sustainability culture that is ingrained in its values and practices, employees are more likely to be committed to sustainable behavior (Roscoe et al., 2019). Leadership support for sustainability initiatives is also essential to promote sustainable behavior. When leaders actively promote and prioritize sustainability practices, employees are expected to be inspired and committed to adopting sustainable behaviors (Tan et al., 2020).

Understanding and promoting sustainable behavior intention has important implications for individuals and organizations. High levels of sustainable behavior intention among individuals support organizations' overall sustainability efforts (Al-Ghazali & Afsar, 2021; de Vos et al., 2020). They actively practice sustainable methods, lessen environmental impact, and encourage civic virtue. Additionally, the intention to engage in sustainable behavior produces advantageous results

for people, such as elevated job satisfaction, a stronger sense of purpose, and enhanced wellbeing. From an organizational standpoint, the intention to engage in sustainable behavior is linked to better environmental performance, cost savings, and improved reputation (Aftab et al., 2022). It promotes a sustainable culture, draws in environmentally conscious stakeholders, and aids in accomplishing sustainability objectives (Smircich, 2017).

3 | THEORETICAL UNDERPINNING AND HYPOTHESES

3.1 | Theoretical background

This study uses SET that explains that people evaluate the advantages and disadvantages of their interactions and relationships with others as part of a social exchange process (Ahmad et al., 2023; Cortez & Johnston, 2020; Wang et al., 2019). SET can help explain the connection between authentic leadership and sustainable behavior intention, as well as the mediating role of employee engagement and the moderating effect of environmental values (Kaya & Karatepe, 2020; Oh et al., 2018). Authentic leadership qualities like self-awareness, openness, moral judgment, and fostering a positive workplace culture can be seen as valuable resources that leaders offer to their staff (Zheng et al., 2022). The workforce views these resources favorably in their interpersonal interactions with their managers. By displaying higher levels of sustainable behavior intention, employees are more inclined to give back in exchange for these benefits (Su & Swanson, 2019). When workers believe their leaders are authentic and engage in constructive social interactions, they are more likely to feel valued, supported, and motivated to contribute to the company's goals. As a result of their increased engagement, people feel more inclined and committed to adopt sustainable behaviors because they see it as repaying their leaders for the advantages they have provided (Ansari et al., 2021). We presented the theoretical framework in Figure 1.

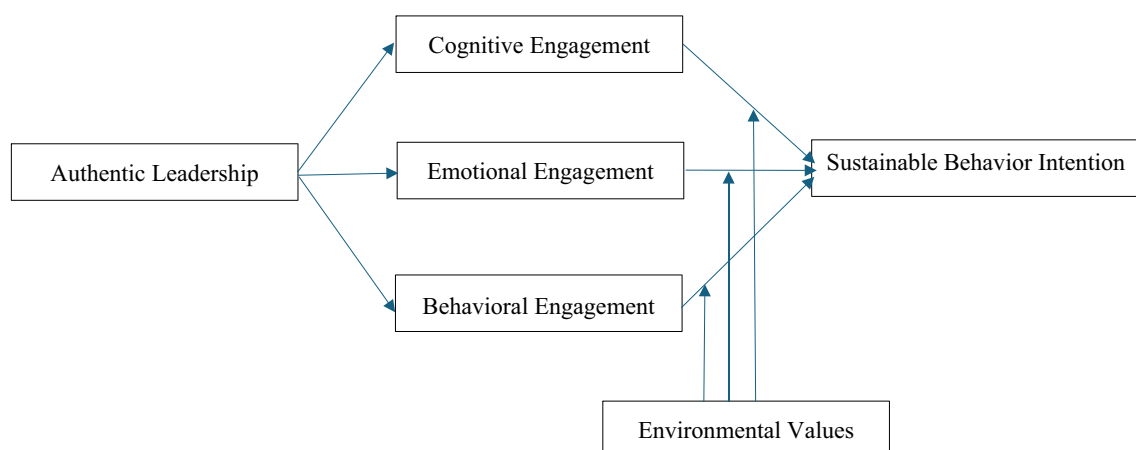


FIGURE 1 Theoretical framework. Source: Author's creation

3.2 | Hypotheses development

3.2.1 | Authentic leadership and sustainable behavior intention

Leaders who exhibit self-awareness, transparency, and moral decision-making and cultivate positive relationships with their followers are considered authentic leaders (Singh et al., 2020). They serve as an example for their staff by making moral choices that consider how those choices will affect society and the environment (Zheng et al., 2022). Employees consequently gain a greater sense of responsibility, increased awareness of sustainability issues, and increased motivation to adopt sustainable behaviors. Authentic leaders also build strong bonds with their followers, which contributes to developing a motivating and encouraging work environment (Semedo et al., 2019). Employees are more engaged in their work, and the company shows higher zeal, commitment, and involvement (Hadian Nasab & Afshari, 2019). They align their actions with the values and goals of the organization, including its sustainability goals, and they experience a sense of ownership and accountability that encourages proactive participation in sustainable practices. Drawing from the literature on authentic leadership and its impact on various employee outcomes, we propose that authentic leadership positively influences employees' sustainable behavior intention (Adigüzel & Kuloglu, 2019; Semedo et al., 2019). Based on prior research, we conceptualize that authentic leadership positively impacts sustainable behavioral intentions (e.g., Kaya & Karatepe, 2020; Wirawan et al., 2020). Hence,

H1. Authentic leadership has a positive impact on sustainable behavioral intentions.

3.2.2 | Mediating role of employee engagement

Based on SET ideas, authentic leaders constantly interact well with their staff members to build mutual respect and trust (Farid et al., 2020). When leaders display authentic behaviors marked by openness, truthfulness, and ethical principles, followers see these as investments in their growth and wellbeing (Kim et al., 2020). Employees are, therefore, more likely to respond with cognitive involvement. Cognitive engagement, a favorable job-related psychological state, measures how engrossed individuals are in their work and how meaningful and significant it is to them (Deepa, 2020). One may argue that authentic leadership techniques foster an atmosphere where staff members feel valued and respected, heightening cognitive involvement.

Similarly, authentic leaders prioritize employees' wellbeing and demonstrate care and consideration (Koon & Ho, 2021). By doing these steps, the company develops a supportive emotional environment that encourages emotional involvement (Raineri & Paillé, 2016). The notion contends that when leaders try to foster a caring and compassionate workplace, staff members respond by giving their time,

energy, and dedication (West & Chowla, 2017). Authentic leadership practices that promote open communication, attentive listening, and sincere care boost emotional involvement by creating a feeling of community and a strong emotional bond between leaders and staff (Ribeiro et al., 2022).

When an authentic leader shows behavior prioritizing employee wellbeing, growth, and development, employees perceive these actions as indications of a supportive work environment (Søvdal et al., 2021). This perception encourages employees to give back by exhibiting proactive behavior and commitment to their roles (Coun et al., 2022). Behavioral engagement involves employees going beyond their prescribed tasks and contributing actively to organizational success (Khaskheli et al., 2020). Authentic leadership techniques that promote autonomy offer chances for skill development and acknowledge employees' contributions foster behavioral engagement by strengthening workers' feelings of ownership and dedication to organizational objectives (Cavazotte et al., 2021; Firouznia et al., 2021).

H2. Authentic leadership positively impacts
(a) cognitive, (b) emotional, and (c) behavioral employee engagement.

Using the SET standpoint, we believe cognitive employee engagement can influence the intention to engage in sustainable behavior. Employees are more likely to identify with the organization's values and goals when they have a high level of cognitive engagement (Saks, 2006). This alignment fosters a sense of reciprocity, where employees perceive that the organization acknowledges and rewards their engagement efforts (Gupta et al., 2017). As a result, employees may help to develop a stronger intention to engage in sustainable behaviors that contribute to the organization's long-term success. Similarly, when employees experience positive emotions and a sense of attachment to the organization, they are more likely to reciprocate by engaging in behaviors that align with the organization's values and goals (Ahsan, 2023; Raineri & Paillé, 2016).

In recent years, there has been an increasing emphasis on employee engagement and its influence on various behavior outcomes (Haj-Salem et al., 2023). Research has shown a positive relationship between employee engagement and several job-related factors, such as low burnout, low turnover intentions, low work stress, improved job performance, self-efficacy, organizational citizenship behavior, and job satisfaction (González-Rodríguez et al., 2019; Mazzetti et al., 2023). Researchers have also examined the link between sustainable behavior and employee engagement (Ababneh, 2021; Raza et al., 2021). According to Aboramadan (2022), sustainable behavior is influenced by employee engagement, while Ababneh (2021) also found a positive relationship between employee engagement and sustainable behavior. Pinzone et al. (2019) also discovered that increasing medical staff members' work engagement resulted in more sustainable behavior.

Similarly, Meng and Sun (2019) showed that increasing sustainable behavior through training increased assistant teachers' work

engagement. Additionally, workers with higher levels of education often have a positive outlook on their jobs, which encourages more enduring behavior and increases job engagement (Heras-Saizarbitoria et al., 2022). When employees actively participate in organizational activities and demonstrate a strong commitment to their roles, they establish a mutually beneficial relationship with the organization (Aftab et al., 2023; Ishaq et al., 2024). Employees are encouraged by this connection to set an intention to adopt sustainable behaviors that contribute to the organization's overall success (Cheema et al., 2020). Employees who genuinely care about the organization's wellbeing may also embrace sustainable practices as they become aware of their part in advancing its long-term objectives.

H3. The sustainable behavior intention is affected by (a) cognitive, (b) emotional, and (c) behavioral employee engagement.

H4. The relationship between authentic leadership and sustainable behavior intention is mediated by (a) cognitive, (b) emotional, and (c) behavioral employee engagement.

3.2.3 | The moderating role of environmental values

Environmental values are the sentiment or perception of the significance, worth, or importance that individuals attribute to the environment (Curnock et al., 2019; Zhang et al., 2020). These values, like personal values, norms, and beliefs, significantly shape an individual's behavior. Individuals with strong environmental values naturally favor environmental protection, often translating to adopting environmentally conscious lifestyles. Environmental values are vital in shaping people's attitudes and behaviors toward sustainability (Dietz et al., 1998; Kollmuss & Agyeman, 2002). These values reflect people's intrinsic beliefs about the environment and their duty to preserve it. The relationship between environmental values and engagement levels can significantly impact employees' willingness to embrace sustainable practices inside the company regarding sustainable behavior intention and employee engagement (Aboramadan, 2022). In this context, our research takes a novel perspective by investigating the moderating effect of environmental values on the relationship between employee engagement factors and sustainable behavioral intention.

Cognitive employee engagement involves employees' cognitive investment in their jobs, focusing, attention, and task immersion (Sun & Bunchapattanasakda, 2019). When cognitively engaged, employees are more likely to align their behaviors with the organization's values and goals (Geldenhuis et al., 2021). Employees with strong environmental values may see sustainable behaviors as fundamental to their personal beliefs (Al-Ghazali & Afsar, 2021). This alignment suggests that employees with high cognitive engagement and strong environmental values are more likely to develop a strong intention to engage in sustainable behaviors as they find congruence

between their work engagement and their eco-conscious values. According to Lalot et al. (2019), individuals with high environmental values are more likely to engage in pro-environmental behaviors. Therefore, employees with high levels of cognitive engagement and strong environmental values are more likely to experience a synergistic impact that increases their desire to adopt sustainable behaviors.

On the other hand, emotional employee engagement is described as a strong emotional connection of an individual to his work and with the organization (Turner & Turner, 2020). Employees with emotional

TABLE 1 Demographics

Demographics	Frequency	Percentage
Job position/level		
Mid-level	91	26.3%
Senior-level	112	32.3%
Managerial	83	23.9%
Executive	60	17.3%
Department/division		
Sales	75	21.6%
Marketing	66	19.0%
Human resource	62	17.9%
Finance	48	13.8%
Operations	72	20.8%
Information technology	23	6.6%
Organizational tenure		
Less than 1 year	46	13.2%
1–3 years	75	21.6%
4–6 years	90	26.0%
7–10 years	72	20.8%
More than 10 years	63	18.2%
Age group		
Under 25	38	10.9%
25–34	100	28.9%
35–44	115	33.2%
45–54	68	19.6%
55 and above	25	7.2%
Gender		
Male	200	57.8%
Female	146	42.1%
Education level		
Bachelor's degree	143	41.3%
Master's degree	170	49.1%
Doctorate/PhD	33	9.5%
Manufacturing industry type		
Automotive	100	28.9%
Electronics	95	27.4%
Consumer goods	80	23.1%
Industrial equipment	71	20.5%

Source: Author's creation.

attachment to their organizations are likelier to invest their emotions and commitment into their roles (Leitão et al., 2019). The moderating role of environmental values in this relationship suggests that employees with high environmental values may be incredibly motivated to use their emotional connections to drive behaviors that support sustainability objectives.

According to Clayton (2020) and Kollmuss and Agyeman (2002), people with high environmental values have more intense emotional reactions to environmental concerns. Thus, employees with emotional engagement and strong environmental values may exhibit a high intention to engage in sustainable behaviors due to the emotional resonance of these values with their work experiences. Lastly, behavioral employee engagement is vital, and it makes proactive and enthusiastic contributions to the organization. Behaviorally engaged employees with their organizations are more inclined to go beyond the call of duty to support the company's success (Men et al., 2020).

Therefore, the intention to participate in sustainable behaviors may thus be higher in workers with high behavioral engagement and strong environmental values.

H5. Environmental values moderate the relationship between (a) cognitive, (b) emotional, and (c) behavioral employee engagement with sustainable behavior intention.

4 | METHODOLOGY

4.1 | Participants and procedure

The context of this study is Danish manufacturing firms because these organizations often face sustainability challenges and need effective

TABLE 2 Exploratory factor analysis

Items	AL	CE	EE	BE	EV	SBI
AL1	0.815					
AL2	0.841					
AL3	0.867					
AL4	0.882					
AL5	0.885					
AL6	0.779					
AL7	0.707					
AL8	0.772					
CE1		0.713				
CE2		0.773				
CE3		0.756				
CE4		0.710				
EE1			0.708			
EE2			0.765			
EE3			0.717			
EE4			0.770			
BE1				0.762		
BE2				0.759		
BE3				0.725		
BE4				0.695		
EV1					0.728	
EV2					0.733	
EV3					0.697	
SBI1						0.850
SBI2						0.796
SBI3						0.848
Reliability coefficient	0.947	0.914	0.902	0.898	0.772	0.902

Note: Kaiser–Mayer–Olkin = 0.896, Barlett's sphericity test = 6,020.928; $p < .000$.

Abbreviations: AL, authentic leadership; BE, behavioral employee engagement; CE, cognitive employee engagement; EE, emotional employee engagement; EV, environmental values; SBI, sustainable behavior intention.

Source: Author's creation.



leadership and employee engagement to drive sustainable practices. We sent 600 questionnaires with cover letters to manufacturing organizations such as automotive, electronics, consumer goods, and industrial equipment employees. The first data collection phase (T1) contains questions on authentic leadership and environmental values. In the second phase (T2), the questionnaire on employee engagement dimensions was sent to the respondents who participated in the T1 phase. In the third phase (T3), the questionnaire on sustainable behavioral intention was sent to the managers/

supervisors. At the end of the data collection process, 346 usable questionnaires were selected for further analysis. This time-lagged and multi-respondent strategy helps us mitigate common method bias issues. The response rate of this study is 60.83%. Demographic information was also collected from the participants to learn more about their characteristics, such as age, gender, education level, tenure in the organization, job position, and department (see Table 1).

TABLE 3 Reliability and convergent validity

Variable	Item	Standardized factor loading	CR	AVE
AL	AL1	0.807	0.937	0.651
	AL2	0.854		
	AL3	0.870		
	AL4	0.860		
	AL5	0.811		
	AL6	0.785		
	AL7	0.723		
	AL8	0.730		
CE	CE1	0.860	0.89	0.676
	CE2	0.811		
	CE3	0.815		
	CE4	0.801		
EE	EE1	0.876	0.934	0.779
	EE2	0.893		
	EE3	0.897		
	EE4	0.864		
BE	BE2	0.820	0.805	0.580
	BE3	0.750		
	BE4	0.711		
EV	EV1	0.815	0.841	0.638
	EV2	0.798		
	EV3	0.782		
SBI	SBI1	0.716	0.784	0.548
	SBI2	0.744		
	SBI3	0.760		

Source: Author's creation.

4.2 | Measurement

We employed a 5-point Likert scale for all constructs, ranging from 1 *strongly disagree* to 5 *strongly agree*. The scale provided a nuanced understanding of the participants' perceptions of authentic leadership, environmental values, and intention for sustainable behavior by allowing participants to express their agreement or disagreement with the statements. An eight-item scale developed by Walumbwa et al. (2008) was used for authentic leadership. A sample item of authentic leadership is "I actively seek feedback to improve my interactions with others." Four items for cognitive, emotional, and behavioral dimensions of employee engagement were used from the study of Shuck et al. (2017). A sample item of employee engagement includes "I am really focused on my job when I am working." Environmental values were measured using a scale Chou (2014) developed with 03 items. The sample item of environmental values is "In our company, employees feel a personal obligation to do whatever I can to prevent environmental degradation." Lastly, sustainable behavior intention was measured using the scale of Juvan and Dolnicar (2016) and Kim et al. (2024). A sample item includes "I am willing to participate in pro-environmental practices in our organization." All the items are available in Appendix A.

5 | RESULTS

5.1 | Exploratory factor analysis

The first step of data analysis is to check the internal reliability by exploring the factor structure between the respondent and the variable. For this purpose, an exploratory factor analysis (EFA) was performed using the principal axis factoring method (Black &

Variables	AL	CEE	EEE	BEE	EV	SBI	M	SD
1 AL	1						3.48	0.609
2 CE	0.356**	1					4.007	0.428
3 EE	0.592**	0.350**	1				3.874	0.373
4 BE	0.579**	0.651**	0.525**	1			3.806	0.509
5 EV	0.611**	0.607**	0.465**	0.710**	1		3.827	0.342
6 SBI	0.670**	0.550**	0.524**	0.699**	0.754**	1	3.733	0.695

** $p < .01$.

Source: Author's creation.

TABLE 4 Mean, SD, and correlations

Babin, 2019; Krosnick & Fabrigar, 1997). The Kaiser–Meyer–Olkin (KMO) value, which indicates sampling adequacy, exceeded the recommended threshold of 0.70 (KMO = 0.896), and Bartlett's sphericity test yielded a significant result. The summarized results of EFA can be found in Table 2.

5.2 | Confirmatory factor analysis

A confirmatory factor analysis (CFA) was then performed in Amos 24.0 to evaluate the measures' convergent validity and reliability. According to the results, the average variance extracted for each construct was higher than the suggested level of 0.50, which is satisfactory and indicates convergent validity. Furthermore, the composite reliability values exceeded the cutoff of 0.7, confirming the constructs' reliability (Bollen, 1987). Table 3 represents detailed results of standardized factor loadings, convergent validity, and average variance extracted. One item of behavioral engagement was deleted due to low factor loading. A revised CFA model indicates a favorable fit of the model to the data. The ratio of chi-square to degrees of freedom (CMIN/DF) value of 2.016 suggests an acceptable fit, indicating that the model adequately explains the observed relationships among the variables. The Root Mean Square Residual (RMR) value of 0.028 indicates a low discrepancy between the model and the observed data.

TABLE 5 Direct effects

Path	Estimate	S.E.	C.R.	P	Label
SBI ← AL	.334	.044	7.625	***	H1
CE ← AL	.327	.046	7.069	***	H2a
EE ← AL	.629	.046	13.638	***	H2b
BE ← AL	.464	.035	13.188	***	H2c
SBI ← CE	.171	.034	4.964	***	H3a
SBI ← EE	.055	.035	1.593	.111	H3b
SBI ← BE	.366	.045	8.075	***	H3c

Source: Author's creation.

TABLE 6 Mediation table

Path	β	LLCI	ULCI	p value	Status
Mediating hypotheses					
AL → CE → SBI	.056	0.031	0.091	.000	Partial mediation
AL → EE → SBI	.035	−0.010	0.084	.190	No mediation
AL → BE → SBI	.170	0.109	0.230	.002	Partial mediation
Moderating hypotheses					
Paths	β	S.E.	p value	Status	
CE × EV → SBI	.112	0.039	.010	Positive moderation	
EE × EV → SBI	.054	0.045	.227	No moderation	
BE × EV → SBI	.103	0.043	.017	Positive moderation	

Source: Author's creation.

Furthermore, Comparative Fit Index (CFI) values also meet the minimum threshold values.

5.3 | Descriptive statistics

Table 4 presents the variables' means, standard deviation, and bivariate correlation. Correlations among the variables reveal that authentic leadership and cognitive employee engagement have a positive correlation ($r = .356^{**}$), which is statistically significant ($p < .01$). The results further show that authentic leadership and emotional employee engagement have a positive correlation ($r = .592^{**}$), which is statistically significant ($p < .01$). Further authentic leadership positively correlates with behavioral employee engagement ($r = .579^{**}$, $p < .01$). Likewise, authentic leadership has a significant positive relationship with environment values ($r = .611^{**}$, $p < .01$), and sustainable behavior intention has a significant positive relationship ($r = .670^{**}$, $p < .01$). Similarly, cognitive employee engagement also exhibits positive correlations with all other variables. The highest correlation is observed with SBI ($r = .550^{**}$, $p < .01$). Emotional employee engagement shows significant positive correlations with all other variables. The strongest correlation is with SBI ($r = .699^{**}$, $p < .01$). Behavioral employee engagement demonstrates positive correlations with all other variables. The highest correlation is with emotional employee engagement ($r = .710^{**}$, $p < .01$). Environmental values correlate positively with all other variables. The strongest correlation is with SBI ($r = .754^{**}$, $p < .01$). Sustainable behavior intention has a significant positive correlation with all variables. The highest correlation is observed with authentic leadership ($r = .670^{**}$, $p < .01$).

5.4 | Structural equation modeling

Structural equation modeling was used to measure the direct and indirect impact of authentic leadership (AL) on sustainable behavioral intention (SBI). The results (see Table 5) indicated that AL has a significant and positive impact on SBI ($\beta = .334$, $p = .001$), supporting our H1. The AL's impact on cognitive employee engagement (CE):

$\beta = .327, p = .001$), emotional employee engagement (EE: $\beta = .629, p = .001$), and behavioral employee engagement (BE: $\beta = .464, p = .001$) is significant. Therefore, H2a,b and H3c are supported. Similarly, the results reported a positive impact of CE on SBI ($\beta = .171, p = .001$) and a positive impact of BE on SBI ($\beta = .366, p = .001$), supporting H3a,c. In contrast, EE's impact on SBI is insignificant.

The mediating and moderating hypotheses (see Table 6) were also tested using SEM. The indirect impact of AL on SBI via CE ($\beta = .056$, LLCI–ULCI = 0.031–0.091, $p = .001$) and via BE ($\beta = .17$, LLCI–ULCI = 0.109–0.230, $p = .001$) indicates partial mediation. In contrast, the indirect impact of AL on SBI via EE is insignificant. Lastly, the moderating role of environmental values (EVs) between CE, EE, and BE with SBI has been tested. The results showed that EV strengthened the positive impact of CE with SBI ($\beta = .112, p = .01$) and BE with SBI ($\beta = .103, p = .01$), whereas no moderation was found between EE and SBI relationship. The graphical representation of the moderating role of EV is presented in Figures 3 and 4.

6 | DISCUSSION AND CONCLUSION

The results offer insightful information about the effects of authentic leadership on factors of employee engagement and sustainable behavior intention, as well as the mediating role of employee engagement and the potential moderating impact of environmental values. The results supported H1, which determines authentic leadership's positive impact on sustainable behavior intention. This result is in line with earlier studies emphasizing the value of authentic leadership as a catalyst for favorable employee outcomes and behaviors (Chaudhary, 2021; Leroy et al., 2012; Singh et al., 2020). Authentic leaders serve as role models through their transparency, integrity, and ethical behavior and positively influence employees' intentions to contribute to sustainability initiatives.

The study found a positive relationship with statistical results for H2a–c, indicating that authentic leadership significantly influences each dimension of employee engagement. Authentic leaders foster a

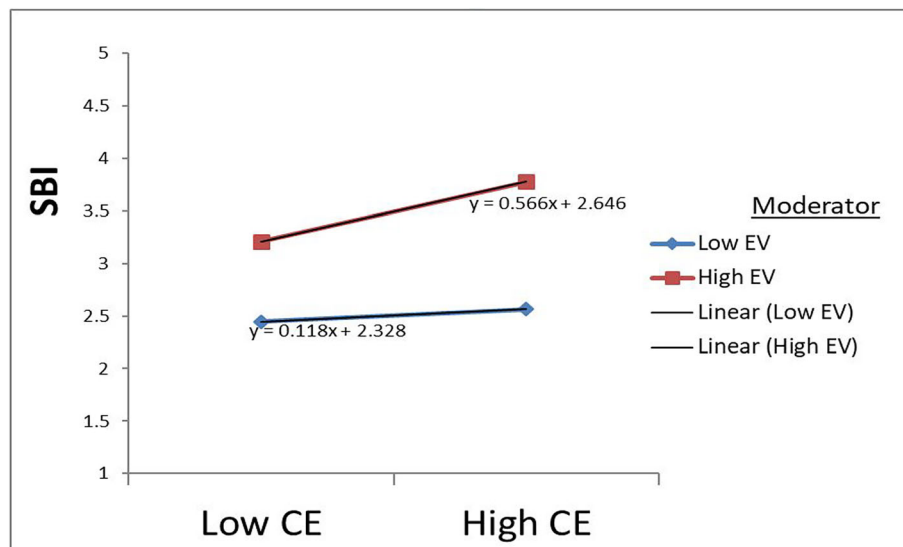


FIGURE 3 Moderation of EV between CE and SBI. Source: Author's creation

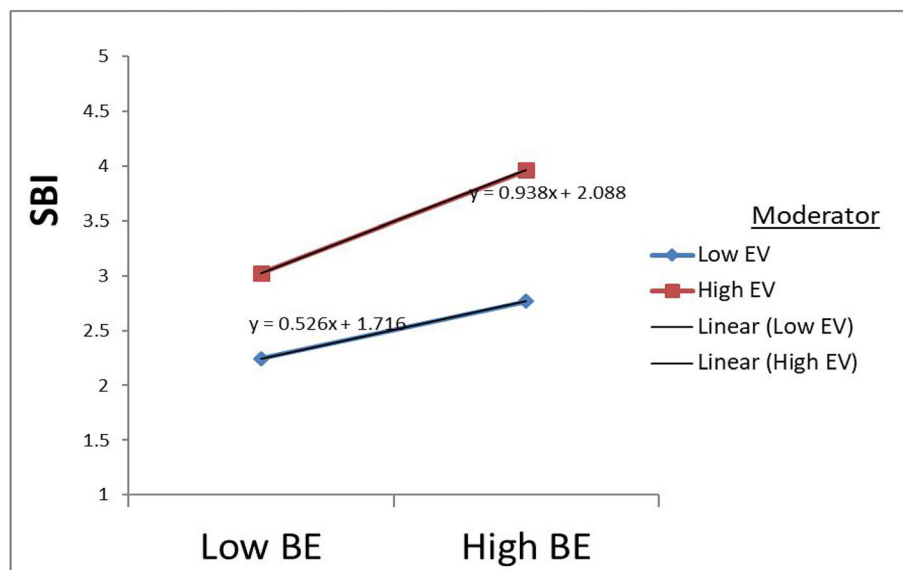


FIGURE 4 Moderation of EV between BE and SBI. Source: Author's creation

culture of open communication, trust, and employee empowerment, which raises staff members' commitment to their jobs and the organization (Men & Stacks, 2014). These findings are consistent with previous research that highlights the positive impacts of authentic leadership on dimensions of employee engagement (Wang & Hsieh, 2013; Joo et al., 2016; Wei et al., 2018).

Similarly, the findings provide significant evidence to support H3a,c, which claim that cognitive and behavioral employee engagement positively correlates with sustainable behavior intention. This aligns with previous studies by Santana and Lopez-Cabrales (2019), highlighting that engaged employees help adopt sustainable practices. Cognitive and behavioral employee engagement, characterized by higher motivation, commitment, and initiative, increases participants' likelihood of engaging in sustainable behaviors (Farooq et al., 2019; Noah & Steve, 2012). When employees feel strongly connected to their work and organization, they are more inclined to adopt and promote sustainable practices. However, H3b, which suggested a positive connection between emotional employee engagement and sustainable behavior intention, was not statistically significant.

The findings of H4a,c suggest that cognitive and behavioral employee engagement mediates the relationship between authentic leadership and sustainable behavior intention. These results imply that authentic leadership affects cognitive and behavioral employee engagement, influencing sustainable behavior intention. Authentic leaders who encourage engagement cultivate a work environment that inspires staff to adopt sustainable habits, advancing the company's sustainability objectives. These findings align with Ababneh (2021), in which employee engagement partially mediates the connection between green HRM practices and individual green behavior, emphasizing the significance of organizational-person interaction in fostering engagement with environmental initiatives. However, we did not find any mediation of emotional employee engagement between authentic leadership and sustainable behavior intention.

Lastly, the analysis supported by H5a,c states that environmental values moderate the relationship between cognitive and behavioral employee engagement and sustainable behavior intention. This underlines the key role of environmental values in shaping employees' inclination toward sustainable practices when engaged in their roles. However, our findings did not support H5b's proposal of moderation between emotional employee engagement and sustainable behavior intention.

6.1 | Theoretical implications

This study adds to the theoretical understanding of the growing body of research on authentic leadership by examining how it affects the intention to engage in sustainable behavior. It highlights the importance of authentic leadership as a driver of sustainable behaviors. It extends the understanding of how authentic leadership can positively influence employee outcomes beyond job satisfaction and organizational commitment. This aligns with a study by Jiang and Shen (2023) and Kaya and Karatepe (2020), further reinforcing the theoretical

foundation of the relationship between authentic leadership and sustainable behaviors.

The mediating effect provides theoretical support for the concept that cognitive and behavioral employee engagement is a mechanism through which authentic leadership influences sustainable behaviors. The moderating impact offers theoretical support for the concept that environmental value is a mechanism through which employees' cognitive and behavioral engagement influences sustainable behaviors. It adds to the body of knowledge on employee engagement by highlighting the importance of employee engagement in advancing sustainability initiatives within organizations. It also aligns with recent studies by Qazi et al. (2020) and Tamar et al. (2021) that underscore the significance of environmental values in understanding the relationship between individual dispositions and pro-environmental behaviors, thus providing a broader theoretical context.

Moreover, this study also provides evidence for the moderating role of environmental values. Furthermore, the study adds to the theoretical framework by integrating the SET. The formulation of hypotheses related to the role of employee engagement draws on SET's principles, offering a comprehensive basis for understanding the intricate interactions between leadership, employee engagement, and sustainable behavior intention. Amrutha and Geetha (2021) have increasingly recognized the relevance of SET in explaining the dynamics of social relationships within organizational contexts, underscoring its importance in advancing theoretical perspectives related to sustainability initiatives.

6.2 | Practical implications

The study's conclusions have several real-world applications for institutions encouraging sustainable behavior and authentic leadership. Organizations should fund leadership development initiatives that strongly emphasize cultivating authentic leadership traits. Organizations can improve their capacity to motivate and influence sustainable behaviors among staff members by offering leaders training and support in developing self-awareness, transparency, ethical decision-making, and interpersonal skills. Organizations ought to foster a culture of sustainability and worker engagement. This can be accomplished by encouraging a culture of trust, open communication, and employee empowerment. A sustainable workplace can be created by allowing employees to participate in sustainability initiatives, rewarding sustainable behavior, and including sustainability objectives in performance reviews.

Employee engagement should be a top business priority to encourage long-term behavioral intentions. This can be done by including staff members in decision-making procedures, offering chances for skill advancement and career growth, and promoting a sense of meaning and purpose in their work. Organizations can use their employees' intrinsic motivation and commitment to drive sustainable practices by cultivating an engaged workforce. Organizations should strive to develop an organizational culture and practices that support sustainability and employee engagement and acknowledge

the importance of authentic leadership in promoting sustainable behavior. They can gain the advantages of increased employee motivation, commitment, and performance while establishing themselves as socially and environmentally responsible organizations.

6.3 | Future research directions

Future research into authentic leadership, employee engagement, and sustainable behavior intention has a better chance of success, thanks to the findings of this study. The causal relationships between authentic leadership, employee engagement, and the intention to engage in sustainable behavior over time may be explored in future research using longitudinal designs. Studies that follow subjects over time would be able to capture changes in behavior and engagement patterns and give researchers a more complete understanding of how these variables develop and interact. This kind of study would help us better comprehend how authentic leadership affects the long-term intentions of sustainable behavior. Other contextual factors could affect the relationship between authentic leadership and the intention to engage in sustainable behavior, even though this study concentrated on environmental values as a potential moderator. Additional organizational factors, such as organizational culture, climate, or industry-specific factors, could be the subject of future research to determine how they interact with authentic leadership to influence the intention of sustainable behavior. Understanding the boundary conditions and contingencies of authentic leadership in promoting sustainable behavior would be more nuanced by looking at various contexts.

Although this study established the mediating role of employee engagement, more research might look into the boundaries of this relationship. For instance, an in-depth understanding of the underlying mechanisms would be provided by examining personal differences, such as personality traits or values that may moderate the relationship between employee engagement and sustainable behavior intention. To gain a deeper understanding of these dynamics, looking at how organizational factors like organizational support or work-life balance affect the relationship between employee engagement and the intention to engage in sustainable behavior would also be helpful. The relationship between authentic leadership, employee engagement, and intention to engage in sustainable behavior may be influenced by cultural factors because this study was conducted in a Danish organizational context. Future research may use cross-cultural studies to investigate how the relationship between these variables varies across various cultural contexts. Insights into the universality or context-specific nature of authentic leadership and its influence on sustainable behavior intention would be significantly aided by research into the role of cultural values, norms, and practices.

Future research may examine other sustainability-related outcome variables, even though this study concentrated on the intention of sustainable behavior. Investigating the adoption of sustainable practices in actuality, environmental performance, or stakeholder perceptions, for instance, could offer a more direct evaluation of the effect of authentic leadership on sustainability outcomes. This would

increase the findings' applicability in the real world and give organizations a more thorough understanding of how authentic leadership affects their sustainability initiatives. By addressing these research gaps, future studies can contribute to a more nuanced understanding of the role of authentic leadership in promoting sustainable behavior intention. These research avenues would expand the theoretical foundations, refine the measurement approaches, and enhance the practical implications for organizations seeking to develop sustainable leadership practices and foster a culture of sustainability.

6.4 | Conclusion

This research proposes a comprehensive theoretical framework that explores how authentic leadership leads to employee engagement and sustainable behavioral intentions in Danish manufacturing firms. The results strongly support authentic leadership's impact on three dimensions of employee engagement: cognitive, emotional, and behavioral. The direct effect of emotional employee engagement on sustainable behavioral intention is insignificant, whereas its mediating path from authentic leadership to sustainable behavioral intention is also insignificant. We also found the positive moderating role of environmental values between employee engagement's dimensions and sustainable behavioral intentions, except the emotional employee engagement dimension.

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APPENDIX A: MEASURING SCALES

Authentic leadership

- AL 1: I actively seek feedback to improve my interactions with others.
- AL 2: I have an accurate understanding of how others perceive my capabilities.
- AL 3: I say exactly what I mean during interactions with others.
- AL 4: I am willing to admit mistakes when they are made.
- AL 5: I demonstrate beliefs that are consistent with my actions.
- AL 6: I make decisions based on my core beliefs.
- AL 7: I solicit views that challenge my deeply held positions.
- AL 8: I listen carefully to different points of view before coming to conclusions.

Source: Walumbwa et al. (2008).

Employee engagement

I. Cognitive engagement

- CE 1: I am really focused on my job when I am working.
- CE 2: I concentrate on my job when I am at work.
- CE 3: I give my job responsibility a lot of attention.
- CE 4: At work, I am focused on my job.

II. Emotional engagement

- EE 1: Working at my current organization has a great deal of personal meaning to me.
- EE 2: I feel a strong sense of belonging to my job.
- EE 3: I believe in the mission and purpose of my company.
- EE 4: I care about the future of my company.

III. Behavioral engagement

- BE 1: I really push myself to work beyond what is expected of me.
- BE 2: I am willing to put in extra effort without being asked.
- BE 3: I often go above what is expected of me to help my team be successful.
- BE 4: I work harder than expected to help my company be successful.

Source: Shuck et al. (2017).

Environmental values

- EV 1: In our company, employees feel a personal obligation to do whatever I can to prevent environmental degradation.
- EV 2: In our company, employees feel personally obliged to save as much energy as possible.
- EV 3: In our company, employees feel morally obliged to save energy, regardless of what others do.

Source: Chou (2014).

Sustainable behavior intention

- SBI 1: I am willing to participate in pro-environmental practices in our organization.
- SBI 2: I try to participate in almost all pro-environmental practices in our organization to reduce waste.
- SBI 3: I actively engage in reducing waste practices in our organization.

Source: Juvan and Dolnicar (2016).