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A scale development study on green innovative work behavior in tourism industry

Turizm endüstrisinde yeşil yenilikçi iş davranışı üzerine bir ölçek geliştirme çalışması

Sefa Ceyhan[1*], Gökhan Demiray[2], Mesut Öztırak[3]

[1]Istanbul Nişantaşı University, Faculty of Economics, Administrative and Social Sciences, Department of Aviation Management, sefa.ceyhan@nisantasi.edu.tr, 0000-0002-3788-0756*
[2]Istanbul Nişantaşı University, Vocational School, Department of Tourism and Hotel Management, gokhan.demiray@nisantasi.edu.tr, 0000-0002-6417-1293
[3]Istanbul Medipol University, Faculty of Business and Management Sciences, Department of Aviation Management, mesut.oztirak@medipol.edu.tr, 0000-0003-4828-7293

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ABSTRACT

The objective of this research is to develop a valid and reliable measurement tool for assessing the alignment between business practices and green innovative behavior among hotel employees. The relevant literature was reviewed in line with this purpose, and a suggestion pool was created by following the three-stage scale development process. The scale obtained from the designed pool was structured and evaluated. The first stage includes in-depth interviews, a qualitative data collection method, and a pool of 48 items created upon analyzing the content of the data retrieved from the semi-structured interviews. The second stage includes a draft question. To structure the scale, expert opinions were first taken on the validity of meaning, appearance, and scope. As a result of the eliminations, a draft scale with 15 items was created. In this context, two different sample groups were determined, and quantitative data were collected through online and face-to-face surveys. Data collected from the field research were subjected to explanatory and confirmatory factor analysis. Study results reveal a green innovative behavior scale of 2 dimensions and 8 items, valid and reliable. They thus can be used in all tourism sectors to measure employees' green, creative behavior. The scale includes the “Green Innovative Awareness” dimension of 3 items and the “Green Innovative Process” dimension of 5 items. In this respect, the Green Innovative Behavior Scale is considered an effective and efficient tool to assess and improve green processes in business enterprises.

ÖZET

Bu araştırma, otel çalışanlarının işletmelerin yeşil, yenilikçi çalışma davranışlarıyla ne kadar uyumlu olduğuna ilişkin algılarını ölçmek için geçerli ve güvenilir bir ölçüm aracı geliştirmeyi amaçlamaktadır. Bu amaç doğrultusunda ilgili literatür taranmış ve üç aşamalı ölçek geliştirme süreci izlenerek bir öneri havuzu oluşturulmuştur. Tasarlanan havuzdan elde edilen ölçek yapılandırılmış ve değerlendirilmiştir. İlk aşama derinlemesine görüşmeler, nitel veri toplama yöntemi ve yarı yapılandırılmış görüşmelerden elde edilen verilerin içeriğinin analiz edilmesiyle oluşturulan 48 maddelik bir havuzdan oluşmaktadır. İkinci aşama taslak bir soru içermektedir. Ölçeği yapılandırmak için öncelikle anlam, görünüm ve kapsam geçerliliği için uzman görüşleri alınmıştır. Elemeler sonucunda 15 maddelik taslak bir ölçek oluşturulmuştur. Bu bağlamda iki farklı örneklem grubu belirlenmiş ve çevrimiçi ve yüz yüze anketler yoluyla nicel veriler toplanmıştır. Saha araştırmasından toplanan veriler açıklayıcı ve doğrulayıcı faktör analizine tabi tutulmuştur. Çalışma sonuçları, 2 boyut ve 8 maddeden oluşan, geçerli ve güvenilir bir yeşil yenilikçi çalışma davranışı ölçeği ortaya koymaktadır. Bu nedenle, çalışanların yeşil, yaratıcı çalışma davranışlarını ölçmek için tüm turizm sektörlerinde kullanılabilir. Ölçek, 3 maddeden oluşan “Yeşil Yenilik Farkındalık” boyutunu ve 5 maddeden oluşan “Yeşil Yenilikçi Süreç” boyutunu içerir. Bu bağlamda, Yeşil Yenilikçi Çalışma Davranışı Ölçeği, işletmelerde yeşil süreçleri değerlendirmek ve iyileştirmek için etkili ve verimli bir araç olarak kabul edilir.

1. Introduction

Advantages also introduce disadvantages. Although the world economy has historically brought a unique level of prosperity to societies and has boosted the quality of life, such developments also brought environmental pollution and distorted ecological balance (Belk, 1985; Dittmar et al., 2014; Gentina et al., 2017; Inglehart, 1981), which is a dire problem for the world (Shahzadi et al., 2023). Several projects have

* Corresponding author / Sorumlu yazar
Asst. Prof., İstanbul Nişantaşı University, Faculty of Economics, Administrative and Social Sciences, Department of Aviation Management, sefa.ceyhan@nisantasi.edu.tr, 0000-0002-3788-0756

been developed to prevent ecological degradation over the past 20 years (He et al., 2022). On the other hand, in some countries with a growth rate above 5%, natural resources used for production continue to pollute the environment. At the meetings of the G7 countries, global warming and environmental degradation are still on the agenda (Anjum et al., 2021; Anwar et al., 2021; Sarwar et al., 2021). According to the Chinese Ministry of Ecology and Environment, China's industrial energy consumption in 2017 accounted for 80% of the total energy (Xi & Zhai, 2022). Besides, developing countries continue to use fossil fuels (Sumaira & Siddique, 2023). In line with this information, it can be said that environmental pollution starts with enterprises engaged in intense industrial activity.

Environmental pollution based on industrial activities can be prevented when business enterprises adopt an environmentalist perspective. Green, innovative businesses can help adopt an environmentalist approach by saving non-renewable resources (Rodrik, 2014; Sumaira & Siddique, 2023). Initially, innovation can be considered a new event, object, or process previously unknown in businesses (Akhmetshin et al., 2018). When combined with environmental awareness, these processes or objects become more important than ever. Therefore, there is a need to introduce the green innovative behavior scale into the relevant literature. For this reason, sustainable approaches in the relevant literature were discussed in the research, and in this context, green practices were highlighted. However, business enterprises need more to develop green practices with sustainable approaches. Employees' role is also significant in achieving organizational goals (Bushi, 2021; Khan, 2018). Based on this, the green innovative behavior scale developed within the scope of this research is critical in two respects. First, the study has the quality to assist sectoral practitioners in their sustainability activities. Secondly, it will guide employees' green innovative activities by shedding light on green participatory activities in the relevant literature.

Digitalization and environmental sustainability have initiated a significant transformation in the tourism industry, driving businesses to become more efficient and sustainable both economically and environmentally. Green innovative behaviors, particularly eco-friendly practices, play a crucial role in enabling businesses to gain a competitive advantage and support sustainable development. However, the successful integration of green innovative behaviors depends not only on technological and environmental infrastructure but also on how tourism industry managers and employees adapt to these practices. Therefore, as digitalization and environmental sustainability drive transformative changes in the tourism industry, the green innovative behavior scale developed in this research becomes crucial not only for guiding employees' eco-friendly activities but also for supporting sectoral practitioners in achieving economic and environmental sustainability. In the tourism industry, the adoption of green innovative behaviors often faces challenges such as a lack of knowledge on eco-friendly practices, resistance to innovation, and uncertainty regarding how these behaviors integrate into business processes. Employees' struggles to adapt to green practices, negative attitudes, and insufficient environmental awareness hinder the effective implementation of green innovative behaviors (Brynjolfsson & McAfee, 2014). Evaluating employee adaptation to these behaviors and their alignment with sustainable tourism practices is essential for developing strategies to improve environmental performance.

The main issue in this study is the insufficient measurement of employees' adaptation levels to green innovative behaviors in the tourism industry and the neglect of their impact on business performance. Low adaptation levels can negatively affect not only environmental sustainability but also businesses' competitiveness and productivity. Furthermore, the lack of comprehensive measurement tools for the relationship between green innovative behaviors and employee adaptation creates an awareness gap. The key research questions are as follows:

- To what extent do employees adapt to the integration of green innovative behaviors into business processes?
- How do employees perceive and respond to the changes introduced by the adoption of green innovative behaviors?
- What challenges do employees face when adapting to green innovative behaviors, and how do these challenges affect business performance?
- What strategies can be developed to reduce resistance and accelerate employee adaptation to green innovative behaviors?

This study aims to develop a green innovative behavior and employee adaptation scale to measure employees' adaptation to green innovative behaviors and assess their impact on business performance. The scale will contribute to the more effective integration of green innovations in the tourism industry and a better understanding of their effects on employee adaptation.

2. Theoretical Framework

2.1. Innovation

Innovation is about generating, introducing, and implementing ideas, offering many opportunities (Alt et al., 2023; Zhou & Verburg, 2020). An innovation process often begins with discovery and can be triggered by a problem that requires urgent intervention within or outside the business. This process leads to idea generation and ways to improve products, services, or processes. As a result, ideas that offer solutions to problems are generated. This process includes getting employees to find support by providing excitement and confidence in presenting different alternatives and finally implementing, testing, and changing the idea (Aboobaker & Zakkariya, 2020; De Jong & Den Hartog, 2010). In past studies, business innovation was described as product development (Muse & Kegerreis, 1969). Today, it is considered the development of the company's products, services, and processes. Du Plessis (2007) defined innovation as the generation of new ideas that improve business processes to achieve positive outcomes and provide a competitive advantage in its sector. In other words, it is expressed as using new ideas or gaining commercial benefits by using existing

information differently (Garcia & Calantone, 2002; Goswami & Mathew, 2005). Based on innovation characteristics, innovative behavior is measured by individual behavior measurements and is accepted as the conscious implementation of ideas to the organization's advantage (Janssen, 2003). According to different perspectives, innovative behavior is expressed as revealing new problem-solving activities and ensuring that these activities and results are permanent in the organization (Ardts et al., 2010; Carmeli et al., 2006). It is known that the most critical starting point for permanent and beneficial innovative ideas is the employees in the organization (Nijhof et al., 2002). Carr et al. (2016) mentioned two types of innovation. The first type of innovation (active innovations) includes goal-oriented and problem-based behaviors triggered by the need to solve a problem. This type of innovation requires more experience and cognitive maturity of the individual. In contrast, the second type of innovation is seen as more accidental or serendipitous: "It exists not to find a solution to a problem but to offer the chance and space for new behavior." However, it is suggested that such innovations may not be learned, therefore cannot be repeated, and are less effective in cultural transmission (Ness, 2021). Innovation and creativity are used interchangeably in the literature. For example, Lemmetty et al. (2021) suggested that creativity includes originality and effectiveness: "The first criterion refers to the novelty and uniqueness of the creative product. The second is related to the value and utility of the product." However, researchers often distinguish between creativity (discovering and generating ideas) and innovation (advocating and implementing ideas). They are also against using these concepts as alternatives and argue that creativity supports innovation while innovation is built on the foundation of creative ideas (Argabright et al., 2012; Griffin & Guez, 2014; Treffinger et al., 2021; Weiss & Legrand, 2011).

2.2. Innovative Behavior

Innovative behaviors are defined as the behaviors of individuals generating and implementing new, original, and valuable ideas and achieving innovative efforts as a result (Farr & Ford, 1990; Kwon & Kim, 2020; Ye et al., 2023). The concept also encompasses the intentional creation, introduction, and implementation of new ideas within a position, group, or organization to benefit performance, group, or organization (Janssen, 2000: 288; Wang et al., 2023). Employees' innovative behaviors are crucial for modern management principles such as sustainable improvement in business processes and creating corporate entrepreneurship and proposition (Fuller et al., 2006).

Innovative behavior can be described as all intentions to create innovations beneficial to the organization and to ensure that the organization benefits from activities of innovation and transformation (Tuominen & Toivonen, 2011). Innovative behavior ranges from continuous improvement to developing radical new ideas impacting the organization. Although the research development department is the main contributor, recommendations and suggestions are received from all departments (Axtell et al., 2000).

However, innovation only takes place gradually in employees. Employees' lack of confidence in being innovative might lead to negative consequences in innovative behavior, preventing innovative behavior. On the other hand, when employees believe in their innovative skills, they are prone to innovation (Hsu & Pereira, 2008). Therefore, it can be said that the emergence of innovative behavior relies on certain elements. First, efficiency-wise, individual performance will have positive and negative consequences. Secondly, socio-political-wise, potential image risks and achievements are also influential. The first has a positive impact on power, whereas the second has a negative relationship with innovative behavior (Yuan & Woodman, 2010). Innovative ideas directly align with creative behavior. Creative behavior usually generates new ideas, whereas innovative behavior focuses on developing and applying new ideas through employees (Yuan & Woodman, 2010; Wang, 2021). When the concept of innovation is assessed in terms of teams or organizational level, it includes the generation and implementation of new ideas, encouraging efficiency or effectiveness (Datta et al., 2023; Wu et al., 2014). Innovative behavior can be expressed as generating, acquiring, developing, and implementing new ideas and encouraging them among employees. In a study on the most innovative leaders in the world, Dyer et al. (2011) observed that innovative behavior consists of such dimensions as questioning, observing, connecting, experiencing, and relationship building. Their study result reveals that employees with innovative behaviors examine the current situation, approach from a different perspective, find solutions, and develop alternatives faster and more efficiently.

2.3. Green Innovative Behavior

Green innovation is a concept with an impact on both the internal and external environment of the business. This concept is not limited to differentiating an existing product or designing a new product. It also protects business resources, the environment, sustainability, and renewable energy sources (Carrión-Flores & Innes, 2010; Chu et al., 2019). The most commonly applied theory in the literature to explain the concept of green innovative behavior, which represents an environmentally oriented approach to behaviors within green concepts, is the "Norm Activation Model," which views it primarily as a socially motivating factor (Schwartz, 1977, p.225). In parallel with this model, moral norms, energy conservation, recycling, travel mode selection, and green purchasing are some of the key studies that contribute to the explanation of green behaviors (Bamberg & Moser, 2007, p.15).

Green innovative behavior is all kinds of activities done by businesses and employees in terms of reducing environmental pollution in businesses, saving energy, waste management, recycling, environmental improvement and following an environmentally friendly policy (Cheng, 2020; De Marchi, 2012). Green innovative behavior is strategically planning and carrying out innovative activities with environmental protection policies by focusing on green in businesses' production and operational activities. The origin of green innovative behavior is based on the natural resource-based view theory (Appannan et al., 2020; Yang et al., 2020). The natural resource-based view theory argues that environmental performance determines business strategies and behavior towards the stakeholders and competitive advantage (Mishra

& Yadav, 2021). According to Shafique et al. (2020), companies can reinvent themselves, adapt to the environment and implement new business processes through continuous innovation. Business enterprises might have positive outcomes through green, innovative behaviors. For instance, they might save operational costs directly upon determining environmental competencies that will boost the actual financial value of a product (Schmidt et al., 2017). Previous research has shown that innovative behaviors form the basis of new business opportunities.

Chen (2008) concludes that enterprises concentrating on environmental management and planning all the processes to integrate the product life cycles are also capable of improving their reputation, developing green innovative behavior, stepping into emerging markets and boosting their performance (Abdullah et al., 2016; Wei et al., 2015). It also helps them control environmental damage and benefit natural resources more sustainably, preserving environmental ecosystems and ensuring a cleaner environment for future generations. Such applications as energy efficiency and waste management boost competitive advantage, create new business opportunities and save costs. Employee satisfaction can be enhanced through an eco-friendly organizational climate and sustainability values.

3. Methods

3.1. Data Collection

In this study, qualitative data collection methods were used to develop a comprehensive scale for Green Innovative Behavior (GIB) and employee adaptation. Initially, data were collected through qualitative methods such as focus group discussions and in-depth interviews. Focus Group Discussions: A focus group consisting of 16 participants, including business managers from the tourism sector with experience in eco-friendly practices and academicians specialized in strategic management and green practices, was formed. This group shared their insights on green innovative behaviors and the integration of these behaviors into business processes. The focus of the discussions was on how green innovative behaviors were applied in the tourism industry, the challenges faced, and the impact of these practices on business performance. In-depth Interviews: Based on the data from the focus group discussions, individual in-depth interviews were conducted with the 16 participants. These interviews provided deeper insights into the employees' processes of adopting green innovative behaviors, the barriers they encountered, and the impact of these processes on business efficiency.

3.2. Data Analysis

The qualitative data collected were analyzed using content analysis. This analysis was systematically performed to identify the main themes within the data. The transcripts of the interviews were processed under the framework of thematic analysis, and the findings were grouped around the following main themes:

- **Knowledge Gaps in Green Innovative Behaviors:** Employees indicated that they lacked sufficient training and knowledge regarding the integration of eco-friendly practices into business processes.
- **Resistance to Green Innovative Behaviors:** Participants expressed resistance to the implementation of green innovative behaviors. They particularly found innovative practices complex and time-consuming.
- **Impact of Green Innovative Behaviors on Business Performance:** The adoption of green innovative behaviors led to significant improvements in business efficiency, cost savings, and environmental sustainability.

3.3. Scale Development Process

A three-stage process was followed to develop the Green Innovative Behavior Scale (GIB): 1) Creation of a proposition pool, 2) Structuring the scale draft, and 3) Evaluation of the scale.

- **Creation of Proposition Pool:** In the first stage, a focus group of 16 participants gathered to develop a series of propositions to measure green innovative behaviors. The participants made statements about topics such as eco-friendly practices, recycling, renewable energy, and energy conservation. A total of 48 items were generated for the proposition pool.
- **Structuring the Scale:** In the second stage, a group of six experts reviewed the scale draft. The experts examined the content validity of the items and made adjustments based on criteria such as linguistic integrity, clarity, scale sensitivity, and understandability. Using Lawshe's (1975) content validity ratio (CVR), items with a CVR value of zero or negative were excluded, resulting in a 15-item scale draft.

Ethical Approval and Implementation: The developed scale was reviewed for ethical compliance by the Istanbul Nişantaşı University Ethics Committee and was approved on 07.08.2023 with approval number 2023/32. Participants were asked to respond to the scale items using a 5-point Likert scale (1: Strongly Disagree, 5: Strongly Agree).

4. Results

The three-stage scale development process for the Green innovative behavior (GIB) includes creating a pool of propositions, structuring, and evaluating the scale (Schwab, 2018). In the first stage, a focus group of 16 people was formed with academicians and corporate experts in business management, organizational behavior, strategic management, green practices, and ethical practices to determine the criteria for measuring GIB. In addition, in-depth interviews, a qualitative data collection method, were conducted, and data were obtained from semi-structured interviews. A proposition pool of 48 items offering a comprehensive framework for GIB evaluation was created upon the content analysis with the data from the interviews and focus group meetings. Items focus on sustainable environment, ecological environment, eco-friendly habits, renewable energy, waste management and recycling. These dimensions generally reflect the essential areas covering the concept of GIB. In the second stage, the opinions of six experts on the Turkish Language, business management, organizational behavior, strategic management, green practices, and environmental practices were consulted

Table 1. Draft Form for Green Innovative Behavior

1. Innovative ideas that will environmentally contribute to our business are supported.
2. Eco-friendly technologies are used in our projects, to increase energy efficiency.
3. Our business organization constantly seeks new waste management solutions
4. Using eco-friendly materials for product and service promotion is crucial to me.
5. Our business organization schedules pieces of training and organizes awareness events to contribute eco-friendly practices.
6. Our workplace regularly reviews activities and processes to curb environmental impact.
7. I have an active role in encouraging eco-friendly technologies and innovations.
8. In our business organization, there is a constant exchange of ideas among employees to reduce the environmental impact.
9. I keep myself up to date about new technologies and methods to reach our environmental sustainability objectives.
10. I care about constantly improving our business organization's waste management and recycling practices.
11. Using eco-friendly materials for product and service promotion is crucial to me.
12. Energy efficiency projects encouraging renewable energy are vital to our business organization.
13. Manufacturing eco-friendly products via sustainable materials and products is important to our business organization.
14. I try to keep myself up to date on environmental topics and to adapt them to my job.
15. I make an effort to include new green ideas and technologies in our business processes.

Source*: Created by authors.*

to structure the scale draft, and the content validity test was conducted. Content validity refers to the quantitative and qualitative adequacy of the items used to measure the characteristics. Consulting expert opinions is frequently used to determine content validity (Armstrong, 1970; Moustakas, 1994). Experts shaped the scale draft according to the scope criteria, scale sensitivity, measurability, linguistic integrity, and understandability.

Within this scope, it is necessary for scale items to address the fundamental issues concerning GIB, align with the scales and operations of different business enterprises, and be based on tangible and measurable objectives. The items must have clear and precise language so stakeholders can easily understand them and modify their practices accordingly. Lawshe's (1975) method was used to determine content validity ratio (CVR). Of 48 items, items with zero or negative CVR were excluded, and a draft scale form consisting of 15 items was created. Upon designing the questionnaire form for field research, the Istanbul Nişantaşı University Ethics Committee confirmed the ethical conformity on 07.08.2023 with no 2023/32. In the scale form, the participants were asked to rate the items on a 5-point Likert scale, ranging from "1. Strongly disagree" to "5. Strongly agree." Table 1 shows the "Draft Form for the GIB Scale". Then, the thematic analysis table of Green innovative behavior and Employee Adaptation is presented in Table 2. In this table; Theme: Broad categories identified from the research findings. These themes represent the main subjects of the overall analysis. For example, "Knowledge Gaps in Green Innovative Behaviors" or "Strategies and Improvement Suggestions." Sub-theme: More specific aspects under each main theme. For example, "Employee Training Gaps" or "Resistance to Innovative Practices." Codes: More explicit and tangible concepts or expressions linked to the themes and sub-themes. These codes provide a clear definition of the characteristics related to each theme. For example, "Insufficient knowledge" or "Integration of eco-friendly practices." Sample Quotes: Direct quotes from participants in interviews or focus group discussions. These quotes illustrate the themes and sub-themes, providing evidence for their validity and authenticity. This table organizes the thematic analysis of the research findings into a coherent structure, allowing a systematic presentation of the data. It helps in understanding the relationships between different aspects of green innovative behaviors, employee adaptation, and the overall impact on business performance. In the completion of this process, support was obtained from the relevant literature (Carpenter, 2018; Hinkin, 1995).

4.1. Population

The research population consists of five-star hotel employees working in Istanbul. The research population was selected particularly from Istanbul for two reasons. Istanbul is the city with the most hotels in Turkey (Ministry of Culture and Tourism, 2024). Secondly, it was preferred because it provides ease of access for the researchers. Five-star hotels were selected because they may have a high awareness of green management. The convenience sampling method was preferred in the research (Nam, 1987; Singh & Masuku, 2014). The sampling method by Bryman and Cramer (2001) was used to determine the number of samples within the research population. This method stipulates that a minimum of 5 or 10 times the number of scale items is required for scale development studies. In this research, there are 14 scale items, therefore, the minimum number of participants required is

Table 2. Draft Form for Green Innovative Behavior the Descriptive Status of Participants

First Working Group				Second Working Group			
Variables	**n=149**	**F**	**%**	**Variables**	**n=187**	**F**	**%**
Gender	Female	61	40.9	Gender	Female	69	36.9
	Male	88.1	59.1		Male	118	63.1
Education	Bachelor's degree	32	21.5	Education	Bachelor's degree	23	12.3
	Master's degree	117	78.5		Master's degree	164	87.7
Marital Status	Married	55	36.9	Marital Status	Married	47	25.1
	Single	94	63.1		Single	140	74.9
Age	24-29	31	20.8	Age	24-29	23	12.3
	30-35	45	30.2		30-35	56	29.9
	36-41	44	29.5		36-41	65	34.8
	42 and over	29	19.5		42 and over	43	23.0

Source*: Created by authors.*

Table 3. Total Correlation of Items

	Total Correlation of Items	Reliability When Deleted
Item 1	0.627	0.956
Item 2	0.655	0.956
Item 3	0.702	0.955
Item 4	0.738	0.954
Item 5	0.713	0.955
Item 6	0.793	0.954
Item 7	0.561	0.958
Item 8	0.660	0.956
Item 9	0.633	0.957
Item 10	0.720	0.954
Item 11	0.632	0.958
Item 12	0.721	0.954
Item 13	0.747	0.955
Item 14	0.806	0.955
Item 15	0.810	0.955

Source*: Created by authors.*

140. The first and second field surveys conducted in this direction were carried out between 07.08.2023 and 30.08.2023 and a total of 336 hotel employees were reached. This number represents the total number obtained from two different applications. The initial study group consisted of 149 employees working at five-star hotels in Istanbul. The results of this demographic information are presented in Table 3. The data obtained from the field research were subjected to exploratory factor analysis and one item was removed. After the related analyses were carried out, the second stage of the research was started to reach the second sample required for scale development. At this stage, the scale was updated.

The updated questionnaire consists of three parts. The first part includes four questions about demographic variables (gender, age, educational status, and marital status), The Second part contains the "Green innovative behavior Scale" consisting of 14 statements. In the last part, the Environmental Sustainability Scale was used. The scale was developed by Severo et al., (2015) and consists of three questions and one dimension. This questionnaire was applied to 168 employees working in five-star hotels in Istanbul as the second study group. As a result of the CFA analysis, the GIB scale, consisting of 2 dimensions and 8 items, took its final form. The scale consists of 3-item individual innovative behavior and 5-item organizational innovative behavior dimensions.

4.2. Validity and Reliability Analysis

The data from the field research were first subjected to reliability analysis. Cronbach's Alpha coefficient was used for reliability analysis. An analysis of total item correlation coefficients reveals that the total correlation coefficient of the items is greater than or equal to 0.300. In this case, no items were deleted, a high overall reliability coefficient was obtained, and all items were found suitable for inclusion in the exploratory factor analysis. Additionally, analysis was performed to determine whether the data exhibited normal distribution. The analysis focused on skewness and kurtosis values, two factors of normality. Analysis revealed that data varied between +1 and -1, indicating a normal distribution (Tabachnick & Fidell, 2013). Findings regarding normality analysis are presented in Table 4, and findings regarding exploratory factor analysis are presented in Table 5.

Upon determining the reliability and normality of the research data, explanatory factor analysis (EFA), the second stage of the scale development process, was applied. In this regard, the scales' construct validity was determined by exploratory factor analysis. Scree Plot Graphic Analysis was used to determine the scale's factor structure. Accordingly, a two-factor rotation process was performed to determine the distribution of the items into factors. The two-factor rotation process considered assigning scale items to factors and factor loading values. Factor load values are essential in assigning scale items to factors or removing them from the scale. It is known that scale items with a total correlation of scale items and factor load values of 0.30 and higher discriminate participants' responses well (Büyüköztürk, 2007). As a result of the relevant analysis, one item, "I take care to constantly improve the practices of our business in waste management and recycling issues," was removed from the analysis due to overloading other items, and the recycling process was applied. Table 5 shows the values obtained in the process. An analysis of Table 5 reveals that the first dimension of the scale comprises nine statements, and the factor loadings range from 0.721 to 0.839. It was found that the second dimension of the scale consisted of five items, and factor loadings varied between 0.693 and 0.859. As a result of

Table 4. Normality and Reliability Analysis Results

Statements (α = 0.958)	Skewness	Kurtosis
1. Innovative ideas that will environmentally contribute to our business are supported.	-0.657	-0.083
2. Eco-friendly technologies are used in our projects, to increase energy efficiency.	-0.355	-0.703
3. Our business organization constantly seeks new waste management solutions.	-0.560	-0.479
4. Using eco-friendly materials for product and service promotion is crucial to me.	-0.463	-0.517
5. Our business organization schedules pieces of training and organizes awareness events to contribute eco-friendly practices.	-0.522	-0.713
6. Our workplace regularly reviews activities and processes to curb environmental impact.	-0.536	-0.699
7. I have an active role in encouraging eco-friendly technologies and innovations	-0.464	-0.493
8. In our business organization, there is a constant exchange of ideas among employees to reduce the environmental impact.	-0.279	-0.789
9. I keep myself up to date about new technologies and methods to reach our environmental sustainability objectives.	-0.626	-0.289
10. I care about constantly improving our business organization's waste management and recycling practices.	-0.647	-0.295
11. Using eco-friendly materials for product and service design is crucial to me.	-0.897	-0.167
12. Energy efficiency projects encouraging renewable energy are vital to our business organization.	-0.401	-0.517
13. Manufacturing eco-friendly products via sustainable materials and products is important to our business organization.	-0.547	-0.498
14. I try to keep myself up to date on environmental topics and to adapt them to my job.	-0.686	-0.266
15. I make an effort to include new green ideas and technologies in our business processes.	-0.614	-0.462

Source*: Created by authors.*

Table 5. Exploratory Factor Analysis Results

Green innovative behavior	GIP	GIA
GIP1	0.839	
GIP2	0.815	
GIP3	0.801	
GIP4	0.792	
GIP5	0.784	
GIP6	0.755	
GIP7	0.743	
GIP8	0.721	
GIP9	0.714	
GIA1		0.859
GIA2		0.829
GIA3		0.781
GIA4		0.712
GIA5		0.693
Percentage of Total Explained Variance	40.736	25.898
Total Explained Variance	66.634	
Kaiser-Meyer-Olkin	0.918	
Bartlett Sphericity	1436.124	
Reliability Values of Dimensions	0.935	0.871
Overall Reliability Value	0.932	

Source*: Created by authors.*

EFA, the suitability of the data was determined by the Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's Sphericity test value. The fact that the Kaiser-Meyer-Olkin (KMO) coefficient is 0.50 and above indicates that the sample is sufficient for factor analysis. Additionally, an analysis of Bartlett's sphericity test results revealed that the -square (X2 = 1436.124; p<0.001) value was significant. Of the total variance explained, the green innovative process (GIP) dimension explains 40,736, and the GIA dimension explains 25,898.

Following the EFA results in Table 5, confirmatory factor analysis (CFA) was applied to ensure structure and decomposition validity. Upon the exploratory factor analysis results in Table 6, confirmatory factor analysis (CFA) was applied. CFA analysis findings are RMSEA = 0.055; GFI = 0.933; AGFI = 0.897; CFI = 0.983 and $\chi 2/sd$ = 1.510. This finding is presented in Table 6. These obtained values indicate that the scale provides construct and discriminant validity (Bentler & Bonett, 1980; Gürbüz & Şahin, 2014). In other words, it can be stated that the goodness of fit values of the measurement model are between acceptable and normal values (Anderson & Gerbing, 1984; Byrne, 2009; Cole, 1987; Moosbrugger & Müller, 2003; Schermelleh-Engel et al., 2003; Schermelleh-Engel, 2003; Tabachnik & Fidell, 2012).

Table 6. Acceptable and Normal Conformity Values

Index	Normal Value	Acceptable Value	Green Innovative Behavior
$\chi 2/sd$	$0 \le \chi 2/sd \le 3$	$3 \le \chi 2/sd \le 5$	1.510
GFI	$0.95 \le GFI \le 1.00$	$0.90 \le GFI \le 0.95$	0.933
AGFI	$0.90 \le AGFI \le 1.00$	$0.85 \le AGFI \le 0.90$	0.897
CFI	$0.95 \le CFI \le 1.00$	$0.90 \le CFI \le 0.95$	0.983
RMSEA	$0.00 \le RMSEA \le 0.05$	$0.05 \le RMSEA \le 0.08$	0.055

Source*: Created by authors.*

Table 7 presents the values in question, along with the analysis findings indicating that all three-item GIA and five-item GIP items are significant (P < 0.001). An analysis of Table 8 shows that some questions were removed from the analysis due to low factor load. First Dimension: Green innovative process (GIP) is referred to as. First question, "Innovative ideas that will environmentally contribute to our business are supported"; second question, "Eco-friendly technologies are used in our projects, to increase energy efficiency"; third question, "Our business organization constantly seeks new waste management solutions. "Fourth question: "Using eco-friendly materials for product and service promotion is crucial to me."; and finally, the fifth question, "Our business organization schedules pieces of training and organizes awareness events to contribute to eco-friendly practices." questions in the form of a questionnaire. Second Dimension: Green innovative awareness (GIA) is referred to as. First question, "Energy efficiency projects encouraging renewable energy are vital to our business organization. "Second question: "Manufacturing eco-friendly products via sustainable materials and products is important to our business organization."; third question, "I try to keep myself up to date on environmental topics and to adapt them to my job." Questions in the form of a questionnaire. Table 8 shows the final scale based on this information.

4.3. Nomological Validity

Nomological validity aims to determine the relationship of the concept of green innovative business behavior with other concepts. In other words, the nomological approach refers to testing the place of the concept in the theoretical network, examining its relationships in the relevant literature (Bagozzi, 1981). Accordingly, green innovative behavior can be associated with green organizational performance (Appannan

Table 7. Confirmatory Factor Analysis Results

			Prediction	S.E.	C.R.	P	AVE	Factor Load
GIA1	<--	GIA	1.000	-	-	-		0.74
GIA2	<--	GIA	1.149	0.112	10.220	***		0.79
GIA3	<--	GIA	1.188	0.122	9.757	***	0.624	0.75
GIA4	<--	GIA	1.240	0.112	11.101	***		0.85
GIA5	<--	GIA	1.223	0.117	10.461	***		0.81
GIP12	<--	GIP	1.000	-	-	-		0.82
GIP13	<--	GIP	1.013	0.078	12.989	***	0.687	0.85
GIP14	<--	GIP	0.925	0.076	12.205	***		0.81
GP2	<--	GP	1.000	-	-			0.88
GP3	<--	GP	1.100	0.083	13.187	***	0.710	0.87
GP5	<--	GP	1.159	0.088	13.128	***		0.79
GP4	<--	GP	1.014	0.085	11.935	***		0.82

Source*: Created by authors.*

Table 8. Green Innovative Behavior Scale

1st Dimension Green Innovative Process (GIP)	**1.** Innovative ideas that will environmentally contribute to our business are supported. **2.** Eco-friendly technologies are used in our projects, to increase energy efficiency. **3.** Our business organization constantly seeks new waste management solutions. **4.** Using eco-friendly materials for product and service promotion is crucial to me. **5.** Our business organization schedules pieces of training and organizes awareness events to contribute eco-friendly practices.
2nd Dimension Green Innovative Awareness (GIA)	**12.** Energy efficiency projects encouraging renewable energy are vital to our business organization. **13.** Manufacturing eco-friendly products via sustainable materials and products is important to our business organization. **14.** I try to keep myself up to date on environmental topics and to adapt them to my job.

Source*: Created by authors.*

et al., 2020; Bamberg & Moser, 2007: 15; Schwartz, 1977: 225; Yang et al., 2020). Within the scope of this relationship, the research hypotheses were formed as follows;

H₁: *Green Innovative Process Has a Positive Effect on Green Performance.*

H₂: *Green Innovative Awareness Has a Positive Effect on Green Performance.*

In order to test the research hypotheses, firstly, it is necessary to determine the relationships between variables, i.e., correlation analyses. The results of the analyses performed in this direction are given in Table 9.

When the values in Table 9 are examined, it is seen that there is a positive and significant relationship between green innovative awareness and green performance ($r = 0.683$; $p<0.01$). This result can be interpreted as green innovative awareness will increase as green performance increases. When the relationship between green innovative process and green performance is considered, it can be said that there is a positive and significant relationship ($r = 0.848$; $p<0.01$). Therefore, it can be stated that the green innovative process increases as green performance increases. In line with these results, regression analysis was performed to test the research hypotheses. The results of this analysis are presented in Table 10.

When the values in Table 10 are examined, firstly, the direct effect of green innovative process on green performance was examined. The obtained results show that green performance has a significant effect on green performance ($P < 0.000$; $\beta = 0.330$). In line with this result, the first hypothesis of the research, "H_1: Green Innovative Process Has a Positive Effect on Green Performance." was accepted. When the effect of green innovative awareness on green performance was examined, a positive and significant effect could be mentioned ($P < 0.000$; $\beta = 0.623$). In line with this result, the second hypothesis of the research, "H_2: Green Innovative Awareness Has a Positive Effect on Green Performance," was accepted.

5. Conclusion and Discussion

This study aims to create and develop a "Green Innovative Behavior Scale" using scientific methods and analysis so that employees' perceptions of green innovative behavior can be measured. In line with this objective, qualitative interviews, quantitative data collection, and analysis were carried out for the scale development process. The study focused on key issues and standards such as sustainable environment, ecological environment, eco-friendly habits, renewable energy, waste management, and recycling in business life. The results of the statistical analysis demonstrate that the scale measuring green innovative behavior exhibits high internal consistency, with a Cronbach's alpha value of 0.969. The results of the exploratory factor analysis indicate the presence of two underlying factors, designated as "Individual Green Innovative Behavior" and "Organizational Green Innovative Behavior". The findings from the research project suggest that the Green Innovative Behavior scale is effective in terms of usability, reliability, and validity. The development of a reliable and valid scale of green innovative behavior is a crucial advancement in the field. The two dimensions defined in the scale will help business enterprises measure, improve, and promote their contributions to environmental sustainability and green innovation. It will also help them achieve sustainability goals, gain a competitive advantage, create an awareness of performance evaluation and development, and boost employee motivation, green innovation, and corporate social responsibility. This study is unique in that there is no study in the literature offering a scale to measure green innovative behavior. The scale can be applied by reaching more samples from different business types and sectors. The findings of this study may facilitate more comprehensive research into environmentally conscious work practices, thereby enabling businesses to make more informed decisions regarding environmental sustainability and innovation. Kumar et al. (2012) concluded that focusing on green and environmental problems contributes to sustainability. Danso et al. (2019) suggested that environmental sustainability orientation boosts performance results. (Helfaya & Moussa, 2017) concluded that sustainable environmental management practices contribute to businesses' economic benefits and cost savings.

5.1. Practical Implications

An analysis of research results and current research findings reveals that the green innovative behavior scale will contribute

Table 9. Correlation Analysis Result

n=168	(1)	(2)	(3)	ORT	S.S.
(1) GIP	-			3.46	1.14
(2) GIA	683**	-		3.84	1.05
(3) GPER	848**	755**	-	3.23	0.92

Source*: Created by authors.*

Table 10. Regression Analysis Result

n=168	ß	t	p	r	r^2	F/p
Constant	-	2.908	0.004			
H_1. GIA	0.330	12.386	0.000	0.882	0.777	288.218/0.000
H_2. GIP	0.623	-6.585	0.000			

Source*: Created by authors.*

to the relevant literature and practitioners. First, field experts can use this scale to measure green, innovative behavior. In an economic order with limited resources, when business enterprises seek sustainable activities respecting the environment, they seek green, innovative behaviors in their employees and organizations. It is thought that this scale will contribute to the field by determining current employees' green, innovative behaviors and enabling businesses to carry out green-oriented activities and various studies on sustainability. Secondly, green, innovative behavior has a comprehensive nature, offering the economic and environmental benefits necessary to ensure the sustainability of the business. This quality will give business enterprises a more environmentally friendly approach. Thirdly, it will help them perform highly sustainable activities and fully fulfil their social and environmental responsibilities. Fourthly, business enterprises with innovative and green innovative behavior will change employees' perspectives and lead employee behaviors within or outside the organization. Fifth, what differentiates businesses is their human resources skills, knowledge, and business success, and technologies and assets. Therefore, human resources form the basis of competitive input. Effective use of business resources is directly proportional to issues such as knowledge, experience, creativity, and competence of human resources. From this perspective, measuring employee behavior is essential for businesses to achieve ecologically sustainable goals. Therefore, familiarity with the perceptions of GIB will help business organizations progress more efficiently and successfully.

5.2. Theoretical Implications

Today's business culture is a comprehensive issue with environmental, economic and social dimensions. Therefore, studies on sustainability address the concept in question from many perspectives, such as energy resources and financial change (Ali et al., 2023), green human resources management (Yasin et al., 2022), green financial environment (Fu et al., 2023), and green innovation (Ramzan et al., 2023). This situation sheds light on the green understanding in terms of sustainability. The typical outcome of green understanding and sustainability is green behavior. Green behavior consists of individuals sensitive to environmental sustainability principles. Developing new ideas, products, services, business models and technologies to ensure environmental sustainability brings green, innovative behavior to the fore. A literature review points to plenty of organizational behavior research on green work commitment (Marini et al., 2023), organizational support perceived as green (Meraj et al., 2023), green transformational leadership (Agrawal & Pradhan, 2023), and environmental employee participation (Albrecht et al., 2023). However, these studies are not considered sufficient. It is critical to examine the individual and organizational consequences of green innovative behavior and to ensure sustainability in business enterprises through proper action. In other words, innovative green behavior in business enterprises is undeniably significant from a behavioral perspective. In this respect, it is necessary to take a holistic perspective and explain the reasons that highlight green innovative behavior, such as competitive advantage, financial gain, low risk, brand value, growth, environmental responsibility, and financial opportunities (Chowdhurya et al., 2022; Zoogah, 2022). Based on such theoretical and empirical inferences, a green innovative behaviour scale has been developed to measure green innovative behavior in enterprises. Creating the relevant scale will provide many positive contributions, theoretically and practically.

5.3. Limitations and Suggestions for Future Research

The study has some restrictions and limitations, the first of which is that it has a cross-sectional research design. Using the longitudinal research method in scale development helps increase the understanding of the participants' emotional changes in different periods and the power of the responses. For this reason, it is recommended that subsequent research be conducted with a longitudinal research method. Secondly, the sample consists of five-star hotel employees. There is a need to measure the green, innovative behaviors of employees in mass production or in different large-scale service sectors. For this reason, it is recommended that the Green Innovative Behavior Scale be used as a measurement tool in sectors of different sizes and characteristics. Lastly, the questionnaire forms collected in this study are limited to employee views and opinions. This situation leads to the evaluation of the organizational structure from the employee perspective. However, it cannot address the organization as a whole. For this reason, it is recommended that the field research to be conducted in future studies should be carried out with methods that directly address the organization itself.

Ethics Statement: Permission for the survey method used in this study was obtained from the Istanbul Nisantasi University Ethics Committee at its meeting dated 07/08/2023 and with the decision numbered 2023/32. In case of detection of a contrary situation, TO&RE Journal has no responsibility, and all responsibility belongs to the authors of the study.

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