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Contents

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The Relationship Between Corporate Culture and Employee-Based Brand Equity with Supply Chain Performance in Petroleum Enterprises in Vietnam

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Abstract

The objective of this paper is to study the relationship between Internal Brand, Corporate Culture (VHDN) affecting Supply Chain Performance through the mediating role of Employee-based Brand Equity (THNV) in Vietnamese petroleum enterprises. The study conducted testing and analysis of the Structural Equation Model (SEM) "Employee-based Brand Equity Affects Supply Chain Performance at Some Large Petroleum Enterprises in Vietnam" followed by Bootstrap with a sample size of 2000. The results of the study showed that the factors of Internal Brand (THNB), Corporate Culture (VHDN) , Employee Satisfaction (HL); Brand Commitment (CKTH) and Brand Knowledge (KTTH) all positively affected Supply Chain Performance of Vietnamese petroleum companies. Based on these results, the author proposes some management implications to help business leaders come up with solutions to improve the Supply Chain Performance (HQCCU) of the Vietnamese petroleum industry.

Keywords: supply chain, brand value, brand commitment, brand knowledge, internal brand

1. INTRODUCE

Over the years, the petroleum industry has faced various challenges in managing petroleum supply chain performance, especially in the logistics sector, which is unique to the industry. These logistical challenges have a major impact on the prices of oil and its derivatives. In addition to the lack of flexibility in the logistics network of the oil and gas industry due to limitations in the production capacity of crude oil operators, long transportation times and limitations of transportation methods (Industry and Trade, 2022), in terms of human factors, employees at petroleum production and supply companies still do not have good brand awareness, do not clearly understand and believe in the core values, vision and mission of the brand and they do not feel attached to be ready to convey these values to customers. Therefore, studying the impact of factors related to internal branding (THNB), corporate culture (VHDN), and employee-based brand equity (THNV) on the petroleum supply chain performance (HQCCU) is an urgent requirement in the current context, contributing to helping petroleum companies come up with solutions to increase brand competitiveness and improve supply chain performance (HQCCU).

2. METHODOLOGY

2.1 Methodology

The article uses qualitative research methods combined with quantitative methods to conduct the research. With the qualitative method, the authors conducted interviews and group discussions with 7 experts including: 2 PhDs who are university lecturers specializing in logistics, 3 experts

who are managers in petroleum companies and 2 experts who are customer partners, business directors. The results are to build a measurement scale and design a survey table. Quantitative methods are used to conduct the survey in the next step. The authors conducted the survey by sending questionnaires directly to subjects with management level from petrol station manager and above at 4 petrol companies: Vietnam National Petroleum Group (Petrolimex), Vietnam Oil Corporation - Joint Stock Company (PVOIL), Dong Thap Petroleum Trading Joint Stock Company (PETIMEX) and Thanh Le Import-Export Trading Corporation - Joint Stock Company (THALEXIM), the survey period was from April 12, 2024 to August 20, 2024. A total of 600 questionnaires were distributed and 560 valid samples were collected, processed using SPSS 20.0 and AMOS 28 software.

2.2. Literature review

2.2.1 Corporate Culture (VHDN)

Corporate culture can be viewed and understood in three different ways: as an internal variable from within the workplace; as an external variable brought into the workplace; or as a symbolic origin, meaning that culture is something that an organization has or symbolizes that organization (Smirchich, 1983). According to Thompson & Luthans (1990), culture is best understood by tying these three perspectives together, emphasizing that culture is not a stable structure, but rather a constantly evolving structure.

2.2.2 Internal Branding (THNB)

Internal branding is considered a tool to ensure that employees have a common understanding of the desired corporate brand image and that they are able and willing to reflect this image to other stakeholders through their own behavior, Ragheb et al. (2018). Miles & Mangold (2004) showed the impact of internal brand on brand knowledge and there is a positive relationship between internal brand and brand commitment.

2.2.3 Employee Satisfaction (HL)

Keller (1998) argues that brands are not only for customers, but also for employees and that employees play an important role in expressing brand values. Employee satisfaction is linked to how employees feel about their company's brand and how they express that brand when interacting with customers. Employees need to understand and feel a clear sense of brand identity, which will help them feel proud and connected to the company.

2.2.4 Brand Commitment (CKTH)

Brand commitment is the degree to which a customer is willing to repurchase or use a product/service again from a particular brand instead of choosing other brands. Aaker (1991) describes brand commitment as an important part of brand equity, because loyal customers help brands maintain market share, reduce marketing costs, and protect against competitors. Brand commitment can be viewed as a measure of the level of affection, satisfaction, and value that customers feel about a brand.

2.2.5 Brand Knowledge (KTTH)

According to Keller (1998), *Brand Knowledge* is defined as everything that consumers know and feel about a brand. This is the level of consumer awareness of the existence and characteristics of the brand. Aaker (1991) divides brand knowledge into 2 levels:

• Brand Recognition: The ability of consumers to recognize a brand when they see it in a certain context.

• Brand Recall: The ability of consumers to recall a brand without being reminded, such as when thinking about a specific product category.

2.2.6 Employee-Based Brand Equity (THNV)

Keller (1993, 1998) believes that Brand equity is the customer's knowledge (brand knowledge) about the brand. Thus, for internal customers, employees, the first thing is the employee's brand knowledge. This is where information is held in the final stage before conveying information about the organization's brand knowledge to customers as promised in the most effective way. Burmann & Zeplin (2005) believe that EBBE is all employee behaviors that are consistent with the brand identity and brand promise. Thus, it can be said that brand knowledge (Empoyee's brand knowledge) is an important factor in forming EBBE. Both of the above views show that brand equity lies not only in how customers feel, but also in how employees feel, connect with and implement the core values of the brand.

2.2.7 Supply Chain Performance (HQCCU)

Supplied chain efficiency refers to the extended supply chain activities in meeting the requirements of the end customer, including product availability, on-time delivery and all necessary inventory and capacity in the supply chain to provide an efficient and responsive manner (Warren H.H, 2002). The existence of innovative work behavior in modern organizations is significantly recognized by effective leadership. They cultivate innovative thinking and form an innovative work culture to acquire new knowledge, skills, and technologies (Jung et al., 2003). Transformational leadership is positively related to employees' perceptions of empowerment and support for innovation (Jung et al., 2003). In addition, Lianju Ning and Dan Yao (2023) also studied - digital transformation has a positive impact on supply chain performance.

2.3 A Brief Review of Some Studies:

There have been many studies on this issue in the world. The study of Musanzikwa1 & Ramchander (2018) on the relationship between corporate culture and supply chain performance The research results show that businesses do not achieve financial goals, market share growth. Internal business processes are ineffective. Culture is not effective, affecting flexibility, not delivering goods and services on time and also affecting human resource behavior and indirectly affecting customer satisfaction as well as cost savings and profits in businesses; Punjaisri et al. (2011) studied the relationship between internal brand communication, employee-based brand equity and company performance; King and Grace's model (2010) explored the role of employee-based brand equity on employee engagement and job performance; Xiong et al.'s (2013) research model focused on the relationship between employee-based brand equity and employee performance in the service industry; The research model of Burmann et al. (2005) examines the role of employee-based brand equity in creating internal brand engagement based on the use of SEM (Structural Equation Model) to analyze the relationship between brand awareness, employee commitment and performance; Research by Daekwan Kim and Erin Cavusgil, (2009)),"The impact of supply chain integration on brand equity". The research results showed that both inter-firm system integration and supply chain responsiveness have a direct positive impact on brand equity. However, the impact of inter-firm operational integration on brand equity is completely mediated by supply chain responsiveness. Research by Ebru Surucul et al., (2018). "Measuring the impact of supply chain orientation and brand equity". The research results show the importance of supplier supply chain orientation in the supply chain, if partners want to develop a high-performance supply chain, then the supplier's brand image and brand equity have special roles in creating better HQCCƯ. Research by Lucas Gabriel Zanon et al. (2021)) "Exploring the relations between supply chain performance and organizational culture: A fuzzy

grey group decision model" has introduced a decision-making model that promotes the link between corporate culture and supply chain management, the internalization of culture as a driving force for performance improvement efforts. Research by Martin B. Osei et al. (2023) "Improving sustainable supply chain performance through organizational culture: A competing values framework approach". The research results show that in the context of global supply chains, only the developmental, hierarchical and group culture components of the competing value framework as a model for evaluating corporate culture are beneficial for achieving higher Sustainable supply chain performance.

2.4 Research Hypothesis and Research Model:

2.4.1 Research Hypothesis

Aurand et al., (2005) stated that EBBE is the attitude of employees towards the brand of their organization and integrating brand messages into work activities. Thus, employees will try to convey messages to customers about brand value through service style, making customers satisfied. Customer's satisfaction will bring about the effectiveness of production and business activities. Therefore, Hypothesis H1 "Employee-based brand equity positively affects supply chain performance". The study of Peters and Waterman (1982) demonstrated that a company with a strong corporate culture has a positive impact on superior financial performance. A later study by Kotter and Heskett (1992) reiterated the importance of culture in determining superior financial performance. Thus, this has confirmed that corporate culture is a resource of the enterprise that affects the business activities of the enterprise. From this, the hypothesis "H2 Corporate culture positively affects supply chain performance" is established. In branding, if consumers have a high level of commitment, it shows that they are satisfied with the product (Oliver, 1999) and have a high level of repeat purchase. Ganesan and Weitz, (1996) argued that brand commitment is understood as trust, evidence in commercial transactions and brand commitment as an important factor in building EBBE (Boukis A & George. C., 2018). Therefore, hypothesis H3 "Brand commitment has a positive impact on EBBE" is established. According to Heskett et al., (1994), employee satisfaction leads to work motivation, which increases employee productivity, increasing the efficiency of customer service work. Therefore, Hypothesis H4: "Emnployee satisfaction has a positive impact on EBBE" is established. Keller (1993, 1998) believes that Brand value is customer knowledge about that brand. For employees who are internal customers, brand knowledge is the skills and knowledge that employees want to convey to customers during the transaction process, interacting to complete tasks to increase the company's brand reputation. Hypothesis H5: "Internal brand positively impacts employee engagement" is established.

Internal brand is considered a tool to ensure that employees have a common understanding of the desired corporate brand image and that they are able and willing to reflect this image to other stakeholders through their own behavior, Ragheb et al. (2018). According to the International Journal of Bank Marketing (2014), internal brand management is considered a major contributor to employee satisfaction at work, brand commitment. Studies by Baumgarth et al., (2013), Lohndorf & Diamantopoulos (2014), show that there is an impact of internal brand on brand commitment and brand knowledge. From the above arguments, the research hypotheses are proposed as follows:

Hypothesis H6: Internal brand has a positive impact on brand commitment

Hypothesis H7: Internal brand has a positive impact on employee satisfaction

Hypothesis H8: Internal brand has a positive impact on brand knowledge.

Corporate culture has a strong influence on employees' behaviors and attitudes at work. According to the research results of Xiaoxia Zhang and Bing Li (2013), a good organizational culture will satisfy employees at work. Thompson et al., (1999) emphasized that the culture of an organization is linked to a shared understanding of the brand vision. This shared understanding contributes to employee engagement and commitment to the brand (Thomson et al., 1999)Thus, hypotheses H9, H10, H11 are established:

Hypothesis H9: Corporate culture has a positive impact on employee satisfaction

Hypothesis H10: Corporate culture has a positive impact on brand commitment

Hypothesis H11: Corporate culture has a positive impact on brand knowledge

The research results of Rose Xiaying Chen (2013) have identified corporate culture as one of the strong factors affecting internal brand, it has a positive impact on both brand knowledge and brand experience and employee behavior and attitudes. From the above research results, Hypothesis H12 "Corporate culture has a positive impact on internal brand".

2.4.2 Research Model

Based on inheriting theories, concepts and synthesizing relevant studies, the group of authors proposes the following theoretical research model.

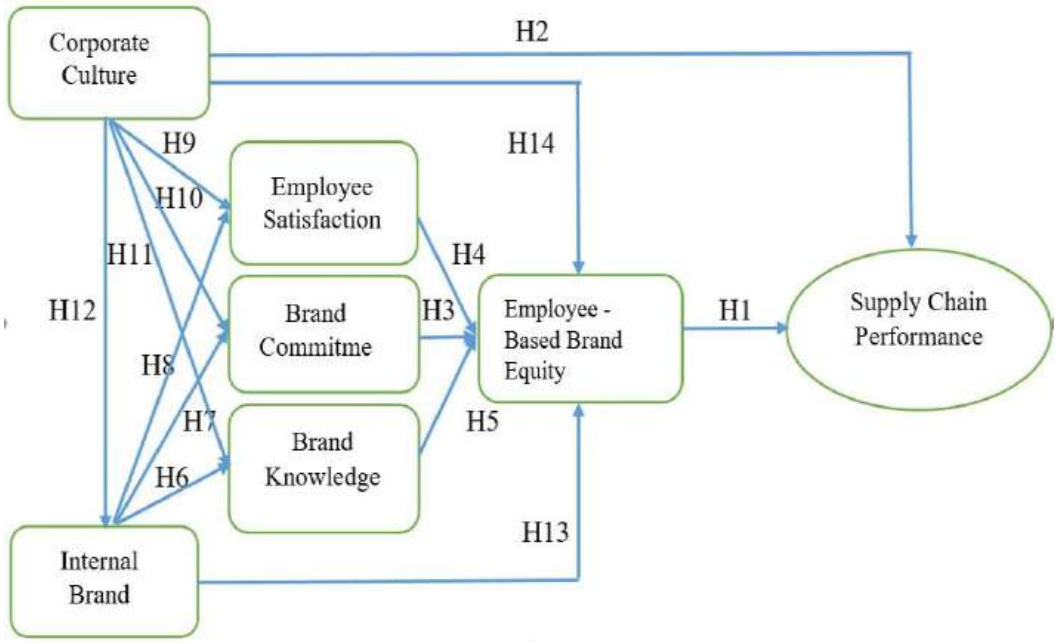

Figure 1: Research Model

3. RESEARCH RESULTS

3.1 Cronbach's Alpha test

Cronbach's Alpha test results of 22 observed variables in the research model, the THNB variable has the observed variable THNB13 with a total variable correlation = 0.138 < 0.3, so we eliminated this variable, ran the second time, the reliability of the THNB scale increased from 0.815 to 0.885. The results showed that 21 observed variables met the requirements and were transferred to confirmatory factor analysis (CFA). The factor analysis results (CFA) of 21 observed variables of 7 factors VHDN, THNB, HL, CKTH, KTHH, THNV and SE had KMO = 0.952, Sig. = 0.000, Eigenvalues = 1.201 > 1, Total Variance Explained = 68.279%, loading factor of 21 observed

variables > 0.5. The composite reliability (CR) of the 7 variables is > 0.5 and the Average Variance Extracted (AVE) of the 7 variables is > 0.5. Therefore, the composite reliability (CR) and the average variance extracted (AVE) both meet the requirements.

The CFA results for CMIN/df = 1.382 < 5. The Goodness-of-fit index (GFI) = 0.932, (Tucker-Lewis) TLI = 0.980, (Comparative fit index) CFI = 0.982 are all greater than 0.9. The Root mean squared error of approximation (RSMEA) = 0.026 < 0.05 shows that the model is good. PCLOSE = 1.000 > 0.05. These results show that the model fits the market data very well.

The results of the composite reliability coefficient test CR (Composite Reliability) of the scales are all greater than 0.7. In which the largest coefficient is THNV (0.947) and the smallest is THNB (0.872). Therefore, the scales all ensure good reliability. The average variance extracted AVE (Average Variance Extracted) of the variables KTTH, VHDN, CKTH, THNB, HL, THNV and SE all have values higher than 0.5. Therefore, the average variance extracted all meet the requirements.

Table 1: Test Results on Reliability and Average Variance Extracted

Latent variables	CR	AVE	MSV	MaR(H)	KTTH	VHDN	CKTH	THNB	HL	THNV	HQ CCU
KTTH	0,942	0,766	0,326	0,944	**0,875**						
VHDN	0,875	0,504	0,164	0,890	0,128**	**0,710**					
CKTH	0,905	0,657	0,399	0,910	0,390***	0,235***	**0,810**				
THNB	0,872	0,578	0,382	0,881	0,193***	0,345***	0,290***	**0,760**			
HL	0,913	0,723	0,371	0,915	0,489***	0,178***	0,502***	0,139**	**0,850**		
THNV	0,947	0,818	0,399	0,950	0,571***	0,202***	0,631***	0,328***	0,609***	**0,905**	
HQCCU	0,896	0,683	0,382	0,900	0,211***	0,404***	0,406***	0,618***	0,266***	0,355***	**0,827**

Source: Extracted from *AMOS*

Table 1: Test results on reliability and average variance extracted Based on the AMOS results, the unstandardized regression coefficients of pairs of variables showing the relationship all have statistical values (P) of 0.000 (***) lower than the 5% significance level, and the AVEs in Table 1 are all greater than 0.5 and the MSV values are all less than AVE. Thus, the model ensures convergence. At the same time, the average variance extracted (AVE) index > 0.5 and is greater than the maximum shared variance index MSV (Maximum Shared Variance), and the correlation between variables in the model must have a p-value < 0.05 and the square root of AVE is greater than the correlations between latent variables, so the model is discriminative (Hair et al., 2010).

3.2 Structural Equation Modeling (SEM)

AMOS processing results for CMIN/df = 1.597 < 5. Goodness-of-fit index GFI = 0.921, Tucker-Lewis TLI = 0.969, Comparative fit index CFI = 0.971 are all greater than 0.9. Root mean squared error of approximation RSMEA = 0.033 < 0.05, indicating that the model is well-fitted. PCLOSE = 1.000 > 0.05. These results indicate that the model fits the market data very well.

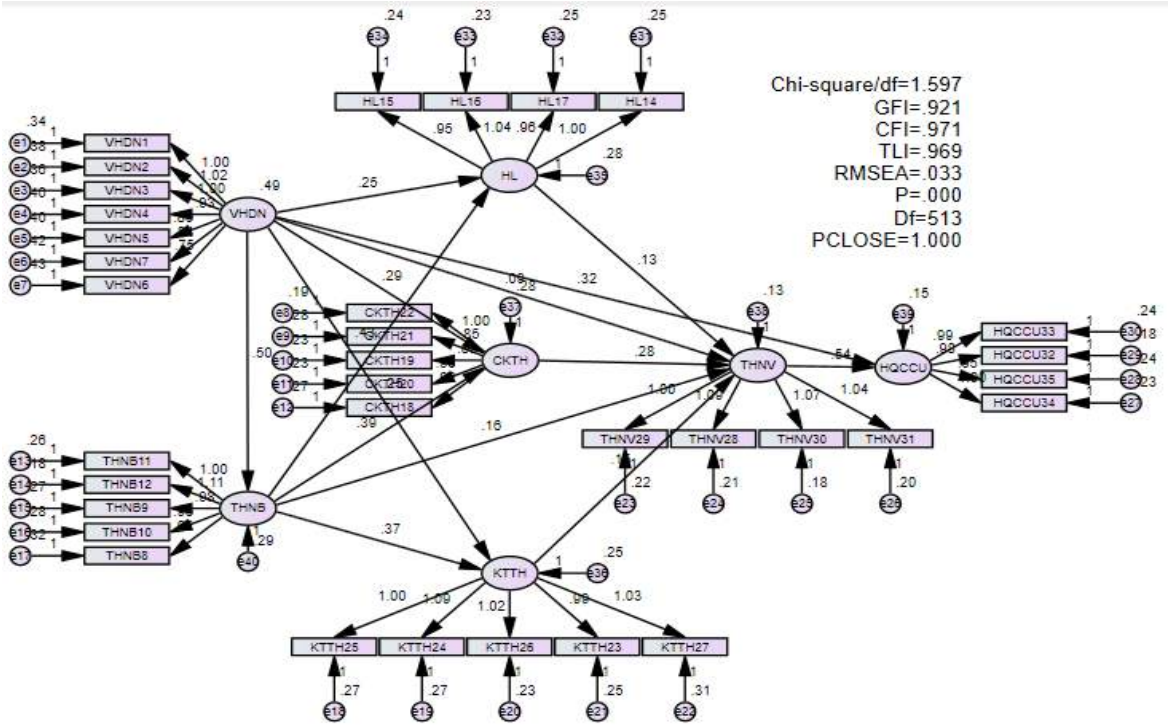

Figure 2: Structural Equation Modeling (SEM)

Source: Extracted from AMOS

The results of data processing show that the unstandardized regression coefficients showing the relationship between pairs of variables are all > 0 and have statistical value, P = 0.000 (***) lower than the 5% significance level, or in other words, these regression coefficients reflect the level and direction of the impact of factors on each other.

Table 2 Results of Regression Weights

			Estimated	S.E.	C.R.	P
THNB	<---	VHDN	0,505	0,045	11,218	***
HL	<---	VHDN	0,246	0,049	5,048	***
CKTH	<---	VHDN	0,293	0,049	5,984	***
KTTH	<---	VHDN	0,255	0,046	5,507	***
HL	<---	THNB	0,431	0,055	7,829	***
CKTH	<---	THNB	0,388	0,054	7,185	***
KTTH	<---	THNB	0,373	0,052	7,230	***
THNV	<---	VHDN	0,093	0,039	2,366	.018
THNV	<---	THNB	0,159	0,048	3,309	***
THNV	<---	HL	0,126	0,039	3,225	.001
THNV	<---	CKTH	0,284	0,040	7,150	***
THNV	<---	KTTH	0,150	0,041	3,682	***
HQCCU	<---	THNV	0,537	0,057	9,369	***
HQCCU	<---	VHDN	0,318	0,042	7,531	***

Source: Summary of results from *AMOS*

3.3 Bootstrap Test

Bootstrap test results with sample size 2000 show that the indicators showing the model's suitability with unchanged data and the pairwise relationships of variables all have P < 0.05, lower than the 5% significance level.

The results of Bootstrap 2000 show that the research sample has a fairly small standard deviation SE of the parameters, indicating the higher reliability of the estimates; The absolute value of Bias is less than 0.1, indicating that the parameters are stable and the Bias/ (SE-Bias) value is not greater than 2. Thus, the parameters of the research model are reliable and ensure stability

Table 3: Results Of Bootstrap 2000

Parameter			SE	SE-SE	Mean	Bias	SE-Bias	Bias/(SE-Bias
THNB	<---	VHDN	.059	.001	.551	.000	.001	0
HL	<---	VHDN	.065	.001	.260	-.002	.001	2
HL	<---	THNB	.065	.001	.422	.001	.001	1
CKTH	<---	VHDN	.052	.001	.309	-.001	.001	1
CKTH	<---	THNB	.048	.001	.376	.001	.001	1
KTTH	<---	THNB	.046	.001	.389	.002	.001	2
KTTH	<---	VHDN	.050	.001	.289	.000	.001	0
THNV	<---	HL	.045	.001	.153	.001	.001	1
THNV	<---	CKTH	.055	.001	.346	-.001	.001	1
THNV	<---	KTTH	.038	.001	.172	.001	.001	1
THNV	<---	VHDN	.064	.001	.119	-.001	.001	1
THNV	<---	THNB	.063	.001	.187	-.001	.001	1
HQCCU	<---	VHDN	.068	.001	.368	-.002	.002	1
HQCCU	<---	THNV	.066	.001	.485	.000	.001	

Source: Extracted from AMOS

3.4 Testing the Hypotheses

Table 4: Results of Testing the Research Model Hypothesis

Hypothesis	Relationship			Unstandardized estimates (SE)	Standard deviation (S.E.)	Reliability (CR)	Value P	Hypothesis evaluation
(1)	(2)			(3)	(4)	(5)	(6)	(7)
1	HQCCU	<---	THNV	0,537	0,057	9,369	***	Accept
2	HQCCU	<---	VHDN	0,318	0,042	7,531	***	Accept
3	THNV	<---	CKTH	0,284	0,04	7,15	***	Accept
4	THNV	<---	HL	0,126	0,039	3,225	0,001	Accept
5	THNV	<---	KTTH	0,150	0,041	3,682	***	Accept
6	KTTH	<---	THNB	0,373	0,052	7,23	***	Accept
7	CKTH	<---	THNB	0,388	0,054	7,185	***	Accept
8	HL	<---	THNB	0,431	0,055	7,829	***	Accept
9	HL	<---	VHDN	0,246	0,049	5,048	***	Accept

Hypothesis	Relationship			Unstandardized estimates (SE)	Standard deviation (S.E.)	Reliability (CR)	Value P	Hypothesis evaluation
(1)	(2)			(3)	(4)	(5)	(6)	(7)
10	CKTH	<---	VHDN	0,293	0,049	5,984	***	Accept
11	KTTH	<---	VHDN	0,255	0,046	5,507	***	Accept
12	THNB	<---	VHDN	0,505	0,045	11,218	***	Accept
13	THNV	<---	THNB	0,159	0,048	3,309	***	Accept
14	THNV	<---	VHDN	0,093	0,039	2,366	0,018	Accept

Source: Synthesis from AMOS

The results from AMOS show that the hypotheses expressing the relationship between pairs of variables all have unstandardized regression coefficients > 0 and the hypotheses all have P < 0.05, so all 14 research hypotheses are accepted.

4. DISCUSSION and CONCLUSION

4.1 Discussion

Compared with the studies of Ebru Surucul, Gul Denktas Sakar (2018), Davis, Donna F., (2003),

Hekmati and Khoshlafz (2017) on the relationship between corporate culture and the efficiency of the essential oil supply chain in Vietnam, it is completely new.

Compared with the studies of Ebru Surucul, Gul Denktas Sakar (2018), Davis, Donna F., (2003), Hekmati and Khoshlafz (2017) on the relationship of corporate culture with the efficiency of the petroleum supply chain in Vietnam, there are some similarities but still some differences as follows. The study by Musanzikwa1.M & Ramchander.M took a survey sample from both inside and outside the business (managers, employees and customers). The supply chain index variable is an intermediate variable. The components of corporate culture are Time orientation, Ownership orientation and Profit orientation, the supply chain index is Flexibility, Transportation and Quality. Compared with the research of authors Musanzikwa1.M & Ramchander.M, the elements in the research model have some different factors from the author's research model such as culture in the digital transformation stage, customer satisfaction, etc.

4.2 Conclusion

By using the method of SEM (Structural Equation Modeling), the reseach results show that the factors: Employee satisfaction; Brand commitment and Brand knowledge all have a positive impact on Supply Chain Performance of petroleum companies through the mediating variable Employee-based Brand Equity. This is a fundamental difference compared to previous studies.

Management Implications

Based on the research results, the authors propose a number of management implications to help business leaders come up with solutions to improve the Supply chain performance of the Vietnamese petroleum industry, specifically as follows:

Brand Commitment:

Petroleum companies must create prestigious values for their brand and communicate those values not only to customers, but also to all employees, thereby making them care and be proud of the brand of the organization they work for and consider the company as part of the family. Companies must propose solutions to maintain and promote the core values of their current brand.

Brand Knowledge

Oil and gas companies need to present a compelling vision of the future; Instill a clear sense of the vision of the organization in employees, and communicate to employees the importance of the organization's goals in delivering on the brand promise. In addition, the company needs to organize seminars and competitions to help employees understand the difference between the unit and competitors, thereby making employees more familiar with the meaning of the company's brand.

Employee Satisfaction

Business leaders must regularly motivate and encourage employees, creating good working conditions for employees. In addition, leaders must also pay attention to the personal life and spirit of employees to have timely support, meet the legitimate needs of employees at work to create a close connection between employees and the organization. From there, employees will be ready to share the hardships, stick with the business in any circumstances

Employees - Based Brand Equity

Companies should build a friendly and positive image of petroleum industry employees in the minds of customers. To do so, businesses should pay attention to the spiritual life of employees, so that they feel happy when working for the company. Pay attention to training and improving professional skills so that employees feel appreciated and feel that this job is really suitable for them. Create a healthy working environment, always with the attention and support of superiors so that employees feel full of positive energy.

Corporate Culture

Therefore, administrators/managers in the petroleum business sector in Vietnam need to have a proper understanding of the value of corporate culture, considering it a sustainable competitive advantage that competitors can hardly pursue, a very valuable and sustainable resource from internal resources at low cost. Therefore, the top leaders of the above enterprises must commit and make specific plans and directions to build corporate culture for their enterprises. Furthermore, Implement investments to accelerate digital transformation that foster the mindset, behaviors, and values needed for the organization to fully integrate new technologies and ways of working. - Develop a management style within the organization that is characterized by teamwork, consensus, participation, entrepreneurship, innovation, or risk-taking.

Internal Brand

Leaders of petroleum businesses in Vietnam must determine goals for internal branding, determine messages, images, brands and methods of conveying and communicating the above information to employees, need to develop orientation programs and orientation sets that inspire employees to appropriately deliver on the brand promise and enhance training and team meetings to build skills that can effectively deliver the brand promise and clearly communicate the brand mission.

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Artificial Intelligence and Industrial Policy

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Abstract

The study concludes by emphasizing the future of industrial policies in the context of digitalization, sustainability, and innovation. It presents policy recommendations to support AI-based production, workforce adaptation, ethical governance, and global regulatory alignment, ensuring sustainable and competitive industrial transformation. The integration of artificial intelligence (AI) into industrial policy is transforming economic growth, governance structures, and workforce dynamics. AI-driven automation and digital transformation are redefining industrial production, requiring policymakers to develop adaptive regulations that enhance efficiency, promote sustainability, and ensure inclusive economic development. This study explores AI's role in industrial policies, focusing on regulatory frameworks, economic implications, and labor market transformations. It examines AI applications in industrial strategies across different countries, highlighting key regulatory measures adopted by the European Union, the United States, and China. Additionally, it analyzes Turkey's AI-driven industrial policies, emphasizing national strategies, regulatory challenges, and efforts to align AI with industrial transformation. The findings suggest that AI-compatible industrial policies should prioritize ethical integration, workforce adaptation, and public-private collaboration to foster sustainable development. Furthermore, the study underscores the importance of balancing innovation with regulatory oversight to mitigate socio-economic risks. By implementing well-structured AI-driven policies, countries can enhance global competitiveness, stimulate economic growth, and drive technological advancements while addressing ethical and regulatory concerns. The study concludes with policy recommendations aimed at fostering AI innovation while ensuring an inclusive and sustainable industrial future.

Keywords: Artificial Intelligence (AI), Industrial Policy, Digital Transformation, Economic Growth

1.INTRODUCTION

The integration of artificial intelligence (AI) into industrial policy is a multifaceted subject that encompasses dimensions such as governance, economic development, and operational efficiency. As AI technologies continue to evolve, their impact on industrial policies becomes increasingly significant, necessitating a comprehensive understanding for their effective management and regulation. AI's role in enhancing operational efficiency in manufacturing is of critical importance. Research indicates that AI can significantly boost productivity and technological innovation, thereby strengthening the position of manufacturers and countries in the global value chain (Dhamija & Bag, 2020; Liu, 2024). Despite its potential, the application of AI in production operations remains underutilized, suggesting a substantial opportunity for industries to leverage AI for smarter decision-making and operational improvements (Dhamija & Bag, 2020).

Policymakers should emphasize the development of tailored economic strategies, increased investment in AI research and development (R&D), and the importance of personnel training in this field (Huang, 2023).

Ensuring the responsible implementation of AI technologies requires robust governance. Effective AI governance frameworks can guide the development and deployment of AI systems that support ethical standards and mitigate risks related to data privacy, security, and discrimination (Miyamoto, 2023). Establishing such frameworks is essential for building trust among stakeholders, including consumers, businesses, and public institutions. Inclusive governance models that involve diverse stakeholders can enhance the comprehensiveness of AI policies and ensure that the benefits of AI are equitably distributed across society (Moon, 2023).

As AI becomes integrated into industrial policies, it is also crucial to consider its broader economic implications. The advancement of AI has the potential to disrupt traditional economic structures and influence foreign policy and international relations (Bonsu, 2020). As AI technologies reshape industries, governments must adapt their policies to manage economic fluctuations and safeguard national interests. This entails not only developing strategies to promote the adoption of AI but also addressing its ethical and social ramifications (Chatterjee, 2020). The intersection of AI and industrial policy also raises questions regarding its impact on the workforce. The automation capabilities of AI can lead to significant changes in employment patterns, highlighting the need for policies that support worker retraining and skill enhancement. Addressing these challenges is critical for preparing the workforce for the evolving job market shaped by AI technologies.

In summary, the integration of AI into industrial policy requires a holistic approach that addresses operational efficiency, governance frameworks, economic impacts, and labor market transformations. Policymakers must harness the potential of AI while addressing its associated challenges to support sustainable industrial growth in the age of AI. This study discusses the potential ways in which AI may affect industrial policy, examines the challenges encountered in aligning industrial policy with AI-driven production and daily life, and proposes policy recommendations.

2. CONCEPTUAL FRAMEWORK

2.1 Overview of Industrial Policies

Industrial policies refer to strategic approaches aimed at enhancing the structure, development, and competitiveness of a country's industrial sector. Typically, these policies focus on goals such as economic growth, job creation, technology transfer, increased productivity, and strengthening international competitiveness (Rodrik, 2008). The fundamental aim of industrial policies is to boost industrial production capacity, contribute to economic development, support sectoral transformation, and promote sustainable development in the industry (Aiginger & Rodrik, 2020).

Industrial policies generally fall into two main categories: state intervention and free-market approaches. State-interventionist industrial policies involve direct government actions to steer the industrial sector. Through instruments like incentives, subsidies, and tax breaks, the government can stimulate growth in specific sectors (Mazzucato, 2018). Additionally, long-term policies such as infrastructure investments, R&D support, and education initiatives are tools used by the state to guide the industrial sector (Lazonick & Mazzucato, 2013).

On the other hand, free-market-based industrial policies advocate for allowing market dynamics to operate with minimal government intervention. This approach promotes the enhancement of industrial competitiveness through free trade, innovation, and entrepreneurship (Acemoglu & Robinson, 2012).

The effectiveness of industrial policies is measured by the transformations occurring within the industrial sector. Such transformations include modernization of production structures, increased labor productivity, technological advancements, and sectoral diversification (Evans, 1995). Moreover, aligning industrial policies with sustainable development objectives—reducing environmental impacts and delivering social benefits—is also a key criterion (Schot & Steinmueller, 2018).

2.2. Regulatory Measures for AI Applications in Industrial Policies

The regulation of AI applications in industrial policies is critically important for developing innovative strategies that support economic growth. The integration of AI technologies into production processes not only transforms the labor market but also necessitates updating industrial policies to accommodate these new technologies (Brynjolfsson & McAfee, 2014). To ensure the effective use of AI in industry, various countries have developed regulatory frameworks. In industrial policies concerning AI, the existing regulatory frameworks can be categorized as follows:

- **European Union Regulations**
  The European Union (EU) has introduced comprehensive regulations to ensure the ethical and safe use of AI in industry. The EU Artificial Intelligence Act classifies AI applications based on risk levels, imposing stringent regulations on high-risk industrial applications (European Commission, 2021).
- **United States Regulations**
  The United States has implemented regulatory initiatives that both promote the use of AI in industry and provide a risk management framework. The National Institute of Standards and Technology (NIST) has published an AI Risk Management Framework, which offers guidance for the safe application of AI in industrial processes (NIST, 2023).
- **Chinese Regulations**
  China is developing a regulatory framework for AI applications within its national AI strategy. The "New Generation AI Development Plan" published in 2017 promotes the widespread adoption of AI in industry through incentive programs and focuses on data security and algorithmic transparency (China AI Development Plan, 2017).

2.3. Key Regulatory Areas for AI Applications in Industrial Policies

Regulations for AI applications in industrial policies are critical for managing modern production processes in an effective, secure, and sustainable manner. With the widespread adoption of AI technologies in the industrial sector, there is an increasing need to develop regulatory frameworks in areas such as data security, ethical use, market competition, employment impacts, and sustainable production. Inclusive governance in AI policy design is increasingly emphasized in recent literature. Moon (2023) argues that participatory governance models enhance the legitimacy and effectiveness of AI regulation, especially when diverse stakeholders are involved in shaping industrial strategies. Moreover, assessing the maturity of AI governance frameworks provides insights into how policies are operationalized. Miyamoto (2023) highlights that corporate-level AI adoption and governance readiness are critical indicators for evaluating national AI strategies in industrial sectors.

The increasing use of large-scale data processing introduces significant privacy and security risks associated with AI-based systems in industry. In this context, the EU's General Data Protection Regulation (GDPR) and various data security regulations in the United States aim to ensure that the use of AI in industry does not violate the privacy rights of individuals and organizations

(Voigt & Bussche, 2017). The principles of transparency, accountability, and reliability in the analysis of large data sets have become central to industrial policies.

Alongside the widespread adoption of AI, ethical and responsible use principles have become paramount. In particular, preventing biases and discrimination in AI algorithms is a core element of ethical AI policies (Russell & Norvig, 2021). To ensure ethical governance in industry, industrial policies should establish standards and strengthen accountability mechanisms, which are essential for protecting consumer rights and developing reliable AI systems in industrial processes.

Moreover, the widespread integration of AI technologies in production can directly affect market dynamics. The dominance of major technology companies in the AI domain highlights the need for competition policies and antitrust regulations (Shapiro & Varian, 1999). As AI becomes an integral part of industrial processes, policies must be developed to promote competition, prevent market monopolies, and create regulatory mechanisms that enable new entrants to compete in the AI field. Another significant impact of AI on industrial policies is the transformation of labor dynamics. With the rise of automation, many industrial sectors are restructuring their work processes, which may lead to job displacement in some areas while creating new occupational categories (Frey & Osborne, 2017). Accordingly, industrial policies must include education and skill-enhancement programs to train a workforce capable of adapting to AI-supported industrial processes.

Finally, the use of AI in sustainable production processes is gaining increasing importance in industrial policies. Global initiatives such as the EU Green Deal provide policy frameworks for using AI to enhance environmental sustainability in industry (European Green Deal, 2020). AI-driven solutions for energy efficiency, optimized production processes aimed at reducing carbon emissions, and more efficient resource utilization contribute significantly to shaping industrial policies along the lines of environmental sustainability.

2.4. AI Regulations in Industrial Policies in Turkey

Turkey has developed various regulatory measures and strategic documents to align its industrial policies with AI. In this context, the National Artificial Intelligence Strategy (2021–2025) provides the foundational policy framework for integrating AI into industrial policies (Doğan Çalışkan, 2023). The strategy document focuses on accelerating the digital transformation of industry, enhancing domestic technological development capacity, supporting international competitiveness, and transforming employment. Strategic approaches such as increased R&D investments, incentive mechanisms, and public–private partnerships are being adopted to promote the widespread use of AI in industry.

The Digital Transformation Programs implemented by the Ministry of Industry and Technology play a significant role in advancing the digitalization of the industrial sector in Turkey. Within these programs, financial incentive mechanisms have been established to support the broader adoption of AI in production processes (Sanayi ve Teknoloji Bakanlığı, 2022). Various funds and support programs have been applied to accelerate the digital transformation of small and medium-sized enterprises (SMEs), promoting automation, the Internet of Things (IoT), and AI applications in industry. For Turkey to continue its progress in this field, investments in the necessary infrastructure and human resources to enable industrial entities to adopt AI-supported production systems must be increased.

Another key regulatory framework governing the use of AI in Turkey's industry is the Personal Data Protection Law (KVKK) and associated data security policies. To ensure data security and protect individual privacy in AI-driven industrial applications, regulatory frameworks have been

established (KVKK, 2021). Developed in accordance with the EU's GDPR, the KVKK sets out principles of security and transparency for the use of big data in the industrial sector. As data-driven AI applications become more prevalent, issues such as data governance, ethical principles, and algorithmic transparency are expected to gain further prominence.

For the successful implementation of AI-supported industrial policies, it is critical to develop domestic and national AI technologies, increase R&D investments, and strengthen international collaborations. Innovative solutions that promote the use of AI in industry are being developed through projects supported by TÜBİTAK and private sector initiatives (TÜBİTAK, 2023). Additionally, there is a need to nurture a skilled workforce and to establish legal frameworks addressing the ethical use of AI during the industrial transformation.

In conclusion, Turkey's strategies for integrating AI into its industrial policies encompass key goals such as accelerating digital transformation, increasing domestic production capacity, and enhancing global competitiveness. However, to compete on a global scale in the AI domain, Turkey must develop more comprehensive regulatory frameworks, increase AI investments, and support workforce adaptation to this transformation. The widespread adoption of AI in production processes can enable Turkey to achieve a sustainable and innovative industrial transformation that contributes significantly to economic development.

3.METHODOLOGY and THE FUTURE OF INDUSTRIAL POLICY

This study adopts a comparative policy analysis approach to examine how different countries, including Turkey, the European Union, the United States, and China, integrate artificial intelligence (AI) into their industrial policies. The research primarily relies on qualitative content analysis, using national strategy documents, regulatory texts, and relevant scholarly literature. The study aims to identify key themes and regulatory approaches that shape AI-driven industrial transformation.

The future of industrial policies is being reshaped by global economic transformations, technological advancements, and sustainable development objectives. AI, automation, digitalization, and green industry applications have become fundamental determinants of industrial policies. With the advent of Industry 4.0, production processes are undergoing profound changes, rendering traditional industrial policies insufficient. Therefore, policymakers must consider environmental and social sustainability alongside enhancing industrial competitiveness.

Future industrial policies will be built upon innovative production techniques, digitalization strategies, and green economy practices. The digitalization process in industry is being supported by technologies such as big data analytics, machine learning, and the Internet of Things (IoT), while sustainability-focused policies aim to reduce carbon emissions and promote a circular economy. Global initiatives like the EU Green Deal necessitate that industrial policies adopt environmentally friendly and sustainable practices (European Green Deal, 2020).

Furthermore, the role of the state in industrial policies is evolving. Rather than relying solely on traditional state interventions, policies that encourage innovation, strengthen public–private partnerships, and support technology-driven incentive mechanisms are coming to the forefront. Government support is now being designed not only for specific sectors but to contribute to the overall digital transformation of the production ecosystem (Mazzucato, 2018).

Additionally, significant changes in the labor market are anticipated. The proliferation of AI and automation is forcing many occupational groups to adapt, thereby creating new skill requirements. In this context, it is crucial for industrial policies to be structured in a manner that enhances workforce education and digital competencies (Frey & Osborne, 2017).

Ultimately, the future of industrial policies will be defined by digitalization, sustainability, and innovation. Policymakers must develop strategies that enhance global industrial competitiveness, support economic growth, minimize environmental impacts, and prepare the workforce for the future.

4. DISCUSSION AND CONCLUSION

For industrial policies to succeed in the future, it is essential to develop a range of strategic policy recommendations. First, strengthening incentive mechanisms to support digital and green transformation is crucial. Governments should establish financial support mechanisms to promote AI-based production models and sustainable industrial practices. These incentives can accelerate the digitalization process of the industrial sector while encouraging the adoption of environmentally friendly production techniques.

In addition, education and adaptation programs must be developed to ensure that the workforce can adjust to the evolving dynamics of industry. Considering the impact of AI and automation on the labor market, it is necessary to provide retraining and enhance digital skills among employees. Programs aimed at equipping workers with new competencies—especially in technical skills and data analytics—will support their adaptation to the industrial transformation.

Furthermore, to ensure the responsible use of AI in industry, ethical and legal regulations need to be established. As AI-based applications in industry become more widespread, issues such as data privacy, algorithmic transparency, and ethical governance become increasingly important. Accordingly, regulations should be implemented within an ethical framework to ensure that AI systems operate fairly and are accountable.

Moreover, enhancing collaborations among public institutions, the private sector, and academia will play a critical role in increasing the effectiveness of industrial policies. Public–private partnerships can accelerate the implementation of innovative industrial policies and facilitate the integration of AI technologies into a broader industrial ecosystem. These collaborations can support necessary R&D activities and strengthen the overall innovation capacity of the industry.

Finally, industrial policies should be aligned with global standards. Turkey and other countries need to restructure their industrial policies in accordance with international regulations, such as the EU Artificial Intelligence Act and the Green Deal. To sustain global competitive advantage, it is essential to conform to international legislation concerning AI and digital transformation, thereby adopting an industrial policy based on sustainability and innovation.

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The Impact of Population Growth and Economic Growth on Carbon Emissions in Turkey: Stirpat Model in ARDL Form

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Abstract

The main objective of this study is to determine the effect of population growth and economic growth on carbon emissions in Turkey. The STIRPAT ARDL model was used to analyze the effect of population growth and economic growth on carbon emissions for this purpose. The STIRPAT ARDL (4,0,4), the STIRPAT ARDL (4,4,3), and the STIRPAT ARDL (1,4,3) models were developed for this purpose. These models provide appropriate answers for the study's objective. As a result, population growth and economic growth are associated with increased carbon emissions in Turkey. These results are statistically significant and consistent with the literature. As a result of the results, policy makers will be able to identify two important factors when formulating sustainable environmental policies. The STIRPAT ARDL (4,4,3) model, however, failed to provide an adequate answer to the study's questions.

Keywords: Carbon Emissions, Population, Economic Growth, STIRPAT, ARDL

1. INTRODUCTION

In today's world, economic growth and population growth are the two main causes of global warming and climate change. Increasing environmental degradation and global concerns have led to numerous studies on the environmental effects of economic growth and population growth.

Several studies have suggested that environmental quality deteriorates during the early stages of economic development and improves during the later stages of economic development. In the early stages of economic growth, degradation and pollution increase. Nonetheless, beyond a certain level of per capita income, which will differ for different indicators, the trend reverses, so that economic growth at higher income levels can contribute to environmental improvement (Dinda, 2004; Stern, 2004; Zhang and Cheng, 2009). This phenomenon is known as the environmental Kuznets curve (EKC), which hypothesizes an inverted U-shaped relationship between environmental degradation and economic development. In the early stages of economic growth, industries often prioritize production and expansion over environmental concerns, leading to increased pollution and resource depletion. However, as economies grow and prosper, the effects of environmental degradation become more understood, leading to a shift towards pollution regulation and environmentally friendly technologies.

In contrast, fossil fuels such as coal, oil and natural gas lead to global climate change (Anser, 2020). The classical economic approach suggests that carbon emissions are positively related to economic growth (González-Álvarez and Montañés, 2023). More clearly, environmental degradation is seen as a result of human activities. According to Dietz and Rosa (1997) the most significant anthropogenic factors are (i) population, (ii) economy activity, (iii) technology, (iv) political and economic institutions and (v) attitudes and beliefs. In most countries, rapid

prosperity has led to carbon emissions and the over-consumption of natural resources (Streimikiene et al. 2019).

Environmental degradation is also associated with the first of anthropogenic factors, population. The increasing population, on the one hand, contributes positively to economic growth, while on the other hand, it creates the greatest negative impact on the environment (Martínez-Zarzoso and Maruotti, 2011). Along with population growth, rapid urbanization, aging and changes in the size of individuals forming families are one of the main reasons for greenhouse gas emissions increase (O'Neill et al., 2010). Environmental management says global warming and climate change are caused by increasing energy demand (Alam et al. 2016). As a result, the rapid increase in energy demand, especially global climate change as a consequence of carbon dioxide (CO2) emissions from burning fossil fuels, has presented environmental challenges (Dong et al. 2018). However, there are arguments to the contrary that population growth increases carbon emissions. According to Casey and Galor (2017) developed countries with low fertility rates emit more carbon than countries with high fertility rates.

Generally, there has been a large amount of research concerning the effects of economic growth and population growth on carbon emissions. Some of these studies have been conducted in Turkey. However, the findings of studies focusing solely on economic growth and population growth are ambiguous and limited. As a result, a more detailed analysis of the issue specific to Turkey is required.

This study aims to examine the impact of population, affluence, and technology factors on environmental impacts by using the IPAT (Impact = Population . Affluence . Technology) models and STIRPAT (Stochastic Impacts by Regression on Population, Affluence and Technology) model to analyze short and long term impacts. Additionally, the study includes solutions for the future that aim to promote both economic growth and environmental protection.

2. THEORETICAL FRAMEWORK

SPIRTAT is a model used to measure environmental impact. The model is based on the IPAT formula proposed by Ehrlich and Holdren (1971). The formula describes environmental impact as a function of population, wealth, and technology. However, this formula was later converted to stochastic form by Dietz and Rosa (1997), allowing it to be applied in nonlinear relationships. The SPIRTAT model has become a widely used model for measuring human activities and their impact on the environment.

$$I = P.A.T \quad (1)$$

$$I = a.P^b.A^c.T^d.\ e \quad (2)$$

In this equation

I: Environmental impact (e.g. carbon emissions, water pollution).

P: Population size.

A: Wealth or income per capita (e.g. GDP).

T: Factors such as technological impact or energy intensity.

a: Constant term.

b,c,d: Coefficients showing the elasticity of variables on environmental impact.

e: Error term

When we transform this equation into logarithmic form, the model can be written as follows:

$$ln(I) = ln(a) + b \cdot ln(P) + c \cdot ln(A) + d \cdot ln(T) + ò \quad (3)$$

The study presents chronologically the studies on economic growth, population growth, and carbon emissions (Knapp and Mookerjee, 1996; Say and Yücel, 2006; Martínez-Zarzoso et al. 2007; Ozturk and Acaravci, 2010; Ohlan, 2015; Begum et al. 2015; Azam et al. 2016; Chen et al. 2016; Aye and Edoja, 2017; Sulaiman and Abdul-Rahim, 2018; Wang et al. 2018; Abdouli et al. 2018; Mikayilov et al. 2018; Acheampong, 2018; Mohsin et al. 2019; Hashmi and Alam, 2019; Mardani et al. 2019; Vo et al. 2019; Mohmmed et al. 2019; Rahman et al. 2020; Odugbesan and Rjoub, 2020; Hussain and Rehman, 2021; Namahoro et al. 2021; Pachiyappan et al. 2021; Yang et al. 2021; Onofrei et al. 2022; Rehman and Rehman, 2022; Uzair Ali et al. 2022; Ahmed et al. 2023; Li et al. 2023; Rehman et al. 2023; Guo et al. 2023; Mitić et al. 2023; Dritsaki and Dritsaki, 2024). There are many studies on carbon emissions in the literature. These studies show that economic growth and energy consumption contribute to carbon emissions. In addition, population growth, urbanization and wealth increase energy demand, which in turn increases carbon emissions. As for the solution, renewable energy sources are suggested.

3. PURPOSE AND SCOPE OF THE STUDY

The present study mainly aims to determine the impacts of population growth and economic growth on carbon emissions in the Turkish economy.

The growth in an economy is typically measured by addressing the increase in a country's GDP, which reflects the total production value of various economic sectors. Energy production and industrial activities are critical components of economic growth, and the increase in these sectors' activities often results in higher carbon emissions. For example, the increase in energy production (fossil fuel use) and the expansion of industrial output not only contribute to the growth of GDP but also increase carbon emissions (Stern, 2004). The transportation sector, which meets the logistics needs of trade and industry, is a key component of economic growth. Transportation activities, particularly the heavy use of motor vehicles and air transport, are significant sources of carbon emissions. Expansion in these sectors, together with economic growth, increases carbon emissions (Schäfer and Victor, 2000). The agriculture and construction sectors are two other

important elements of economic growth. Agricultural activities contribute to carbon emissions both directly (e.g., machinery use and fertilization) and indirectly (through land-use changes). The construction sector also increases emissions due to material production (cement, steel) and construction activities (Smith et al. 2014). In this context, economic growth encompasses the effects of sectoral contributions, including carbon emissions. In economic growth analyses, GDP is generally used as an important metric. In this study, per capita GDP was chosen as an indicator of the growth in economy.

Per capita GDP is considered a clearer indicator of economic welfare. Therefore, using per capita GDP captures the effects of individuals' consumption and production habits on the environment more accurately when analyzing the environmental impacts of economic growth (Ravallion, 2012). In countries with rapidly growing populations, the level of income per capita is critically important for environmental sustainability (Perman and Stern, 2003). As per capita income increases, individuals' consumption patterns and energy demand rise, which directly impacts carbon emissions (Stern, 2004).

4. METHODOLOGY

The annual time series data of the period of 1998-2021 were analyzed in this study. The variables examined are greenhouse gas emissions (CO2) (in million tons), mid-year population (in thousands), and per capita GDP (in TRY). The data utilized in the analysis were obtained from the Turkish Statistical Institute (TURKSTAT). The time series were subjected to logarithmic transformation for analysis purposes. The ARDL version of STIRPAT was used in the study. The findings for the standard ARDL model are as follows:

This model analyzes both short-term and long-term relationships within a single framework. As a result, the dynamic interactions between variables can be examined more comprehensively (Pesaran and Shin, 1998). This model can also be used to investigate cointegration among variables, which is particularly important when variables exhibit different stationarity levels (I(0) or I(1)) since the model offers flexibility for such variables (Pesaran et al. 2001). Even with small sample sizes, this model yields reliable results. This is a significant advantage over other time series models, because many economic datasets may contain a limited number of observations (Narayan, 2005). The ARDL model accounts for different lag lengths for each independent variable, enhancing the model's flexibility and allowing for more accurate forecasts (Pesaran and Shin, 1998). However, the process of determining the optimal lag lengths can be complex. If the lag lengths for the independent variables are not specified accurately, then the validity and reliability of the model may be affected (Nkoro and Uko, 2016). The inclusion of lagged independent variables can lead to high multicollinearity among the variables, which can reduce the statistical significance of the estimated coefficients and complicate the interpretation of the model (Zivot and Wang, 2006).

5. STIRPAT MODEL IN ARDL FORM

When the STIRPAT model is implemented with an ARDL model, the model can be written as follows:

$$\Delta \ln(I_t) = \alpha + \sum_{i=1}^{p} \beta_i \Delta \ln(I_{t-j}) + \sum_{j=0}^{q} \gamma_j \Delta \ln(P_{t-j}) + \sum_{k=0}^{r} \delta_k \Delta \ln(A_{t-k}) + \ldots$$

$$\ldots + \sum_{l=0}^{s} \theta_l \Delta \ln(T_{t-l}) + \lambda . ECM_{t-1} + \varepsilon_t \qquad (4)$$

Here:

$\Delta \ln(I_t)$: *The first difference of the environmental impact* $(e.g.\ CO_2\ emissions)$ *expressed logarithmically, i.e. the periodic variation of the environmental impact.*

$\Delta \ln(P_{t-j}), \Delta \ln(A_{t-k}), \Delta \ln(T_{t-l})$: First differences of population, wealth (per capita income) and technology, expressed logarithmically, respectively.

Each represents the short-term impact on environmental impact.

$\beta_i,\ \gamma_j,\ \delta_k,\ \theta_l$: *Coefficients indicating the short – run effects of laggedchanges of each independent variable on environmental impact.*

α: *Constant term.*

ECM_{t-1}: *The error correction term reflects long – run imbalances and shows how these imbalances are eliminated in the long run.*

λ: *Error correction coefficient, which should be in the range* $-1 < \lambda < 0$.

This coefficient indicates how fast the short – term imbalance will be corrected in the long run

$\grave{o}_t$: *Error term.*

A STITPAT ARDL model can analyze short-run and long-run relationships between variables.

In this study, the technology variable is excluded from the model to simplify the model and to account for the lack of reliable data measuring the level of technology. The SPIRTAT ARDL model without the technology variable is as follows:

$$\Delta \ln(I_t) = \alpha + \sum_{i=1}^{p} \beta_i \Delta \ln(I_{t-j}) + \sum_{j=0}^{q} \gamma_j \Delta \ln(P_{t-j}) + \sum_{k=0}^{r} \delta_k \Delta \ln(A_{t-k}) + \ldots$$

$$\ldots + \lambda ECM_{t-1} + \varepsilon_t \qquad (5)$$

6. RESULTS

Table 1 summarizes the main statistical characteristics of LOGCO2, LOGPOPULATION, and LOGGROWTH.

Table 1: Statistical Summary

	LOGCO2	LOGPOPULATION	LOGGROWTH
Mean	19.53367	18.11838	9.553095
Median	19.54165	18.10466	9.616482
Maximum	19.96139	18.27781	11.36479
Minimum	19.13610	17.97023	7.049063
Std. Dev.	0.268532	0.098055	1.120131
Skewness	-0.073138	0.229835	-0.562768
Kurtosis	1.709517	1.789605	2.697803
Jarque-Bera	1.686744	1.676353	1.358156
Probability	0.430257	0.432499	0.507084
Observations	24	24	24

According to Table 1, the mean of LOGCO2 was 19.53, LOGPOPULATION was 18.12 and LOGGROWTH was 9.55.Their median values, 19.54, 18.10, and 9.62, are very close to their means,

indicating that the distributions of the data are symmetric. The standard deviations are relatively low for LOGCO2 and LOGPOPULATION (0.27 and 0.10), but higher for LOGGROWTH (1.12), suggesting a higher level of variability in the growth rate. While LOGCO2 and LOGGROWTH exhibit negative skewness, LOGPOPULATION demonstrates positive skewness. The kurtosis values are close to normal for all three variables, even though LOGGROWTH has a slightly higher kurtosis (2.70), which may indicate the presence of outliers. Given the results obtained from Jarque-Bera test, all variables satisfy the assumption of normal distribution (p-values greater than 0.05). This analysis, based on 24 observations, provides a foundational assessment of the potential nexus among economic growth, population growth, and carbon emissions.

Table 2 summarizes the results of the SPIRTAT ARDL(4,0,4) model, which was developed to examine the relationship between greenhouse gas emissions (CO2), population and GDP per capita.

Table 2. SPIRTAT ARDL Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGCO2(-1))	0.466906	0.110200	4.236906	0.0022
D(LOGCO2(-2))	0.260733	0.112703	2.313454	0.0460
D(LOGCO2(-3))	0.263481	0.102463	2.571480	0.0301
D(LOGGROSS DOMESTIC PRODUCT PER CAPITA)	**0.315177**	**0.070221**	**4.488349**	**0.0015**
D(LOGGROSS DOMESTIC PRODUCT PER CAPITA(-1))	0.021612	0.112672	0.191817	0.8521
D(LOGGROSS DOMESTIC PRODUCT PER CAPITA(-2))	-0.380254	0.109997	-3.456937	0.0072
D(LOGGROSS DOMESTIC PRODUCT PER CAPITA(-3))	-0.412386	0.138473	-2.978109	0.0155
CointEq(-1)*	**-1.406583**	**0.233770**	**-6.016964**	**0.0002**

F-Bounds Test				
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	6.788223	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	4.398655	Prob. F(2,7)	0.0579
Obs*R-squared	11.13773	Prob. Chi-Square(2)	0.0538

The long-term nexus between the series was investigated first. Hypotheses formulated for this purpose were "H0: There is no long-term nexus" and "H1: There is a long-term nexus". As seen Table 1, the calculated F-statistic value was found to be 6.78, which was higher than the upper critical value of I(1) at 3.35, indicating a long-term nexus among the variables. In addition, the lagged error term, CointEq(-1)*, with a value of -1.40, is statistically significant and has a negative coefficient. This finding suggests that the discrepancy between the short- and long-term is reduced by 1.40% each period, gradually disappearing over time. The variable 'GDP per Capita,' representing the short-term parameter in Table 2, was also found to be statistically significant. Furthermore, no autocorrelation issue was detected between the series, and no structural changes were identified in the parameters.

Figure 1 CUSUM and Figure 2 CUSUMQ tests show that the system moves within the confidence interval and there is no structural break in the model. These tests were applied to all models and similar results were obtained.

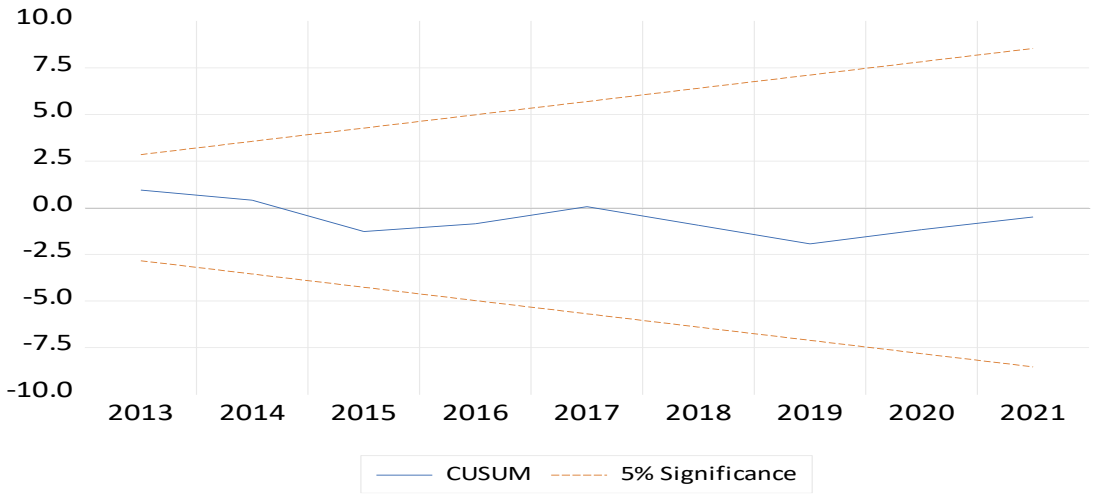

Figure 1: CUSUM

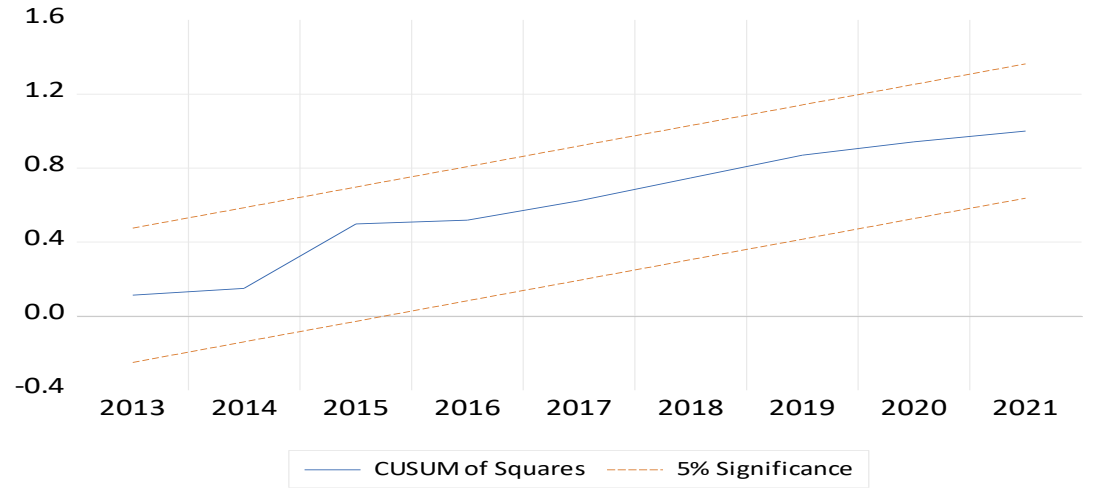

Figure 2: CUSUM of Squares

Based on the SPIRTAT ARDL(4,4,3) model between GDP per capita, population, and carbon emissions, Table 3 summarizes the results.

Table 3. SPIRTAT ARDL Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGPOPULATION(-1))	1.484185	0.194174	7.643563	0.0003
D(LOGPOPULATION(-2))	-0.309401	0.395535	-0.782235	0.4638
D(LOGPOPULATION(-3))	0.660272	0.280088	2.357371	0.0565
D(LOGGROSS DOMESTIC PRODUCT PER CAPITA)	0.016508	0.008568	1.926629	0.1023

D(LOGGROSS DOMESTIC PRODUCT PER CAPITA(-1))	0.001240	0.008731	0.142013	0.8917
D(LOGGROSS DOMESTIC PRODUCT PER CAPITA(-2))	0.025359	0.009858	2.572529	0.0422
D(LOGGROSS DOMESTIC PRODUCT PER CAPITA(-3))	0.013437	0.007768	1.729849	0.1344
D(LOGCO2)	**0.028484**	**0.014115**	**2.017893**	**0.0902**
D(LOGCO2(-1))	-0.055184	0.016309	-3.383619	0.0148
D(LOGCO2(-2))	-0.028793	0.010618	-2.711800	0.0350
CointEq(-1)*	**-0.438621**	**0.099400**	**-4.412675**	**0.0045**

F-Bounds Test				
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	3.245283	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	3.118461	Prob. F(4,2)	0.2573
Obs*R-squared	17.23639	Prob. Chi-Square(4)	0.2017

The first analysis focused on the long-term nexus between the series. As seen in Table 3, the calculated F-statistic value was found to be 3.24, between the lower (2.63) and the upper (3.35) critical bound. This result introduces uncertainty regarding a long-term nexus between the series, thus findings obtained from other analyses were not included.

Table 4 summarizes the results of the SPIRTAT ARDL(1,4,3) model between GDP per capita, population, and carbon emissions.

Table 4: SPIRTAT ARDL Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGCO2)	0.539473	0.186394	2.894263	0.0178
D(LOGCO2(-1))	0.299143	0.177801	1.682461	0.1268
D(LOGCO2(-2))	-0.164511	0.154507	-1.064748	0.3147
D(LOGCO2(-3))	-0.452009	0.155062	-2.915016	0.0172
D(LOGPOPULATION)	**6.497350**	**3.649440**	**1.780369**	**0.0087**
D(LOGPOPULATION(-1))	-11.49908	6.394548	-1.798263	0.1057
D(LOGPOPULATION(-2))	-10.86854	5.287504	-2.055514	0.0700
CointEq(-1)*	**-0.612472**	**0.058780**	**-10.41975**	**0.0000**

F-Bounds Test				
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	20.35709	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	4.121644	Prob. F(2,7)	0.0656
Obs*R-squared	10.81563	Prob. Chi-Square(2)	0.0545

As seen in Table 4, the calculated F-statistic value was found to be 20.35, higher than the upper critical bound (I(1)) of 3.35, indicating a long-term nexus between the variables. In addition, the lagged error term, CointEq(-1)*, which was found to be -0.61, is significant and has a negative coefficient. This finding suggests that the short- and long-term discrepancy is reduced by 0.61% each period, gradually disappearing over time. The short-term parameter 'Population' in Table 4 was also found to be statistically significant. Moreover, no autocorrelation issue was observed between the series, and no structural change was identified in the parameters.

Figure 3 CUSUM and Figure 4 CUSUMQ tests show that the system moves within the confidence interval and there is no structural break in the model.

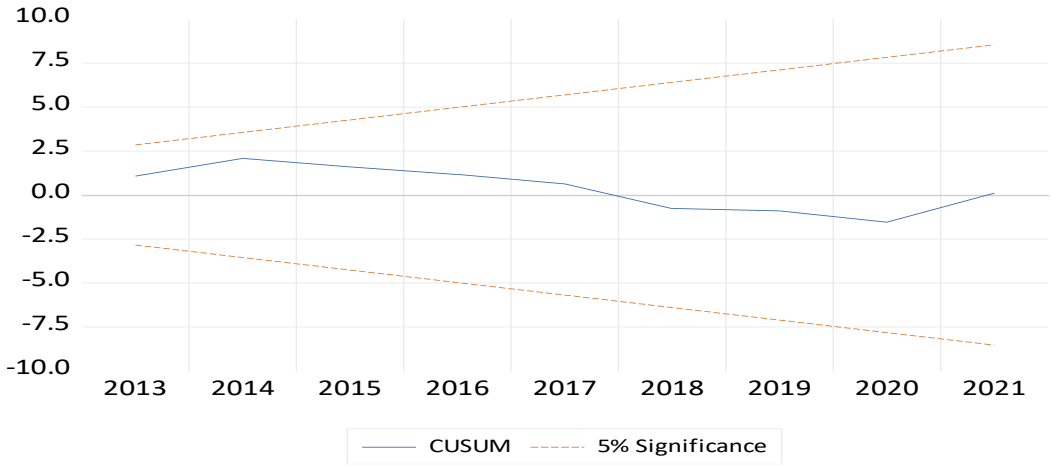

Figure 3: CUSUM

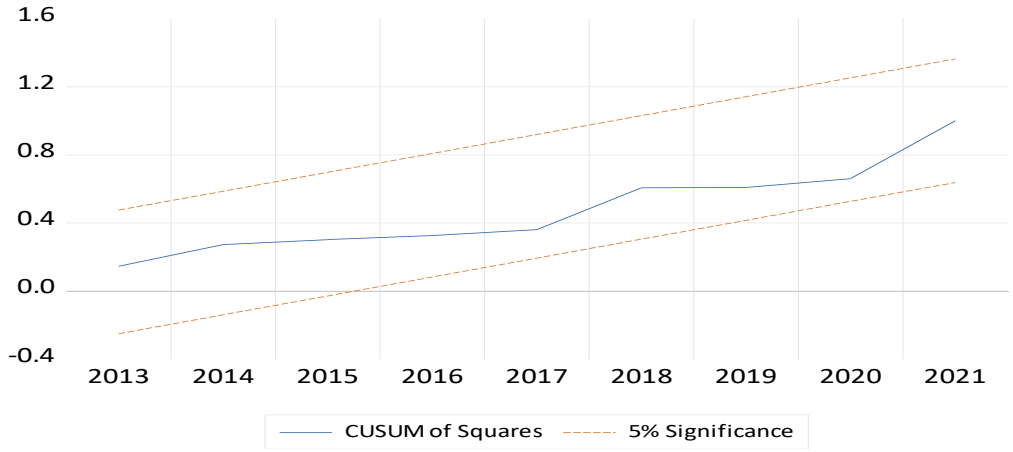

Figure 4: CUSUM of Squares

7. DISCUSSION AND CONCLUSION

This study analyzes how population growth and economic growth affect carbon emissions in Turkey using the SPIRTAT ARDL model. For this purpose, SPIRTAT ARDL(4,0,4), SPIRTAT ARDL(4,4,3) and SPIRTAT ARDL(1,4,3) are used. SPIRTAT ARDL(4,0,4) and SPIRTAT ARDL(1,4,3) models indicate statistically significant and positive relationships between the variables over both the short and long run. A statistically significant error correction coefficient is also found to support the explanatory power and accuracy of these two models, which are attributed to population growth and economic growth in Turkey. A number of factors contribute

to the development of environmentally sustainable economic policies in the Turkish economy, including population growth and economic growth. In contrast, the long-run relationship between the variables in the SPIRTAT ARDL(4,4,3) model is uncertain.

Comparing the results of the study with those of previous literature, it is evident that both technical and conceptual consistency exists. According to Zhang and Sharifi (2024), local governments must develop environmentally friendly policies in order to reduce carbon emissions, and economic growth and environmental impacts must be maintained in balance. As argued by Pradhan et al. (2024) energy efficiency and the use of renewable energy sources will play an important role in reducing carbon dioxide emissions. According to Rahman (2017) urbanization policies should be developed to minimize the effects of population growth on environmental degradation. It can be concluded from this standpoint that educating and raising awareness of the environmental damage caused by carbon dioxide emissions and the widespread use of environmentally friendly technologies will prevent environmental degradation and allow economic growth to continue sustainably (Lee and Zhao, 2023).

In conclusion, efficient and effective population growth and economic growth are two vital issues for national economies. The world faces a number of problems, including global warming and climate change. A reduction of carbon emissions can be achieved through energy efficiency and the use of renewable energy. To reduce carbon emissions on a global scale, agreements promoting energy efficiency and renewable energy use, reducing fossil fuel use, and green-friendly tax regulations will be crucial.

A number of renewable energy sources are available in Turkey, including solar power, wind power, sea waves, and organic agriculture with its fertile soils and forests, which have a geographical comparative advantage. In this study, it is recommended not only to increase the share of these investments, but also to convert these investments into commercial products and export them. For this to be achieved, Turkey must adopt policies that are in accordance with international law, transparent, auditable and reliable, and based on social consensus.

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Impulse Buying: How Fashion Involvement in Generation Z Affects Their Purchases

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Abstract

This study aims to examine impulse buying behavior towards fashion products in Generation Z with gender as a group analysis. Data was collected from 444 students at a university in West Java, Indonesia. The structural equation model partial least square (SEM-PLS) analysis was conducted to analyze the relationship between variables and test a series of hypotheses. Price Discounts, Store Atmosphere, and Fashion Involvement significantly affect Impulse Buying. There are differences in impulse buying behavior between men and women. This research fills the limited literature on SOR theory involving fashion involvement as an organism.

Keyword: Impulse Buying, Consumer Behavior, Fashion Involvement, Gen Z Behavior, Online Shopping.

1. INTRODUCTION

Impulse buying behavior has been a phenomenon that has attracted attention in consumer behavior research over the past few decades (Aiolfi et al., 2022; Atulkar & Kesari, 2018; Hashmi et al., 2020; Kumagai & Nagasawa, 2022; Lee & Chen, 2021; Lin et al., 2022; Mohan et al., 2013; Peng & Kim, 2014; Shen & Khalifa, 2012; Sun et al., 2023). This phenomenon is mainly due to lifestyle changes and technological developments affecting people's shopping. The emergence of various e-commerce platforms has made the shopping process easier. Generation Z is primarily influenced by impulse buying behavior (Djafarova & Bowes, 2021; Munsch, 2021; Zhang et al., 2021).

The behavior of Generation Z is considered materialistic (Flurry & Swimberghe, 2016), tend to be sensitive to trends and lifestyles (Johnson & Im, 2014; Razzaq et al., 2018; Slater & Demangeot, 2021), always want to look fashionable to encourage them to buy items that can show their identity (Djafarova & Bowes, 2021). Generation Z is sensitive to the positive stimuli often offered by fashion products (Muhammad et al., 2023), which are often associated with social, environmental, and multiculturalism issues and trends (Johnson & Im, 2014; Razzaq et al., 2018; Slater & Demangeot, 2021). This positive stimulus elicits positive emotions, thus triggering impulsive buying behavior (Gupta & Gentry, 2018; Muhammad et al., 2023). Generation Z

consumers are, therefore, susceptible to impulsive purchasing (Djafarova & Bowes, 2021; Munsch, 2021; Zhang et al., 2021).

On the other hand, impulse buying behavior shows the seller's ability to carry out his sales strategy (Aiolfi et al., 2022). Researching impulse buying is crucial for businesses to comprehend consumer behavior and ensure their market survival. Today's fashion market is very competitive, characterized by many emerging online retailers with various brands (Keegan et al., 2021). The good news is that the proportion of Generation Z, which amounts to 41%, can be an opportunity for fashion businesses to expand the market. Further, several studies have found that Generation Z actively buys and consumes various products from various online platforms and is referred to as one of the most influential consumer groups (Azhar et al., 2023; Nghia et al., 2020; Van den Bergh et al., 2023). Therefore, an area that requires investigation is how marketers can adapt their sales strategies for online platforms, with a specific focus on fashion products targeted towards Generation Z.

The SOR (Stimulus Organism Response) Theory is extensively applied to the investigation of impulsive purchasing (Chan et al., 2017; Lavuri & Thaichon, 2023; Lin et al., 2022; Sun et al., 2023; Zafar et al., 2021; Zhao et al., 2022). Existing research demonstrates that both internal and external stimuli induce the phenomenon of impulse purchasing (Abdelsalam et al., 2020; Keegan et al., 2021; Redine et al., 2023). These external stimuli include environmental conditions and marketing methods (Dawson & Kim, 2010; Huo et al., 2023). In online shopping, web quality can express environmental conditions (Huo et al., 2023; Keegan et al., 2021). In accordance with the framework postulated by Keegan et al. (2021), the aforementioned external stimuli foster the development of hedonistic tendencies, positive and negative emotions, and engagement with fashion, which are conceptualized as organisms within the SOR model. Moreover, this particular organism is classified as an internal stimulus with the potential to stimulate impulsive buying.

The conducted research predominantly employs hedonism (Çavuşoğlu et al., 2020; Hashmi et al., 2020; Lee & Wu, 2017; Park & Lin, 2020; Peng & Kim, 2014; Vieira et al., 2018) and positive or negative emotions (Djafarova & Bowes, 2021; Hashmi et al., 2020; Zhao et al., 2022) as proxies of organisms. The investigation of fashion involvement as an internal stimulus remains limited. The research model employed in this study is Fashion Involvement, which is deemed suitable due to its focus on the impulsive purchase of fashion products. Furthermore, the attributes associated with Generation Z—a propensity for perpetual trend-following and a desire to appear fashionable—indicate a profound interest in fashion. Furthermore, existing literature suggests that women acquire fashion items out of sheer passion, while men do so out of necessity (Workman & Studak, 2006; Workman & Lee, 2011). Further investigation is warranted to determine whether selling fashion items to men and women necessitates distinct approaches. Thus, this study aims to examine the impulse buying behavior of fashion products in Generation Z with gender as a group analysis.

2. CONCEPTUAL FRAMEWORK AND HYPOTHESES

2.1. SOR

Organismal Response Theory (SOR) is a model that can explain how stimuli affect organisms, which then process those stimuli and produce specific behavioral responses (Russell & Mehrabian, 1974). In the marketing context, this stimulus will cause consumers to be willing to classify, interact, and identify pages and increase their desire to return to the page to buy goods or vice versa (De Luca & Botelho, 2021).

The term “organism” in the SOR model refers to the individual or person who responds to the stimulus (Russell & Mehrabian, 1974). The organism is an active and mediating factor that

processes the stimulus and generates a response based on internal feelings or behavior (Chen et al., 2019; Hashmi et al., 2020; Richard & Chebat, 2016; Russell & Mehrabian, 1974; Shen & Khalifa, 2012). Organisme memainkan peran penting dalam membentuk respon terhadap suatu stimulus dan respon tersebut dapat dipengaruhi oleh berbagai faktor, seperti emosi dan proses kognitif (Chan et al., 2017; Floh & Madlberger, 2013; Li et al., 2022).

The response can be described as consumer reaction, which can be in the form of approach or avoidance behavior De Luca & Botelho (2021) in this study further expressed as a proxy for impulse purchases (see also Zafar et al., 2021). The behavioral approach is where a consumer stays on the web page and carries out a product search process that ends with the purchase process. Avoidance behavior is the opposite.

2.2. Impulse Buying

Impulse buying is unplanned and unexpected when a consumer receives certain stimuli that create a strong urge to buy (Beatty & Elizabeth Ferrell, 1998). Another definition states that impulse buying is a process mechanism in the individual domain that occurs when consumers experience a sudden and persistent urge to buy something immediately (Chan et al., 2017).

If referring to studies conducted, several factors can predict impulse buying behavior: consumer characteristics, marketing-related, website-related, and social-related (Abdelsalam et al., 2020; Redine et al., 2023). An examination of the information presented by Huo et al. (2023) reveals that it is essentially identical to the marketing and environmental factors discussed by Abdelsalam et al. (2020) and Redine et al. (2023). These factors are stimuli that will encourage impulse buying behavior in online shopping (Chan et al., 2017; Hashmi et al., 2020; Li et al., 2022; Sun et al., 2023; Xiao et al., 2022; Zafar et al., 2021). Thus, the Stimulus Organism Response (SOR) model approach became the rationale for this study.

External stimulus in the form of marketing-related factors includes discount prices, promotions, and merchandise ((Büyükdağ et al., 2020; Çavuşoğlu et al., 2020; Iyer et al., 2020; Sheehan et al., 2019). Other external stimuli are website-related factors such as store atmosphere (Atulkar & Kesari, 2018; Geng et al., 2020; Hashmi et al., 2020; Mohan et al., 2013; Xiao et al., 2022). In accordance with the subject matter of this study, which primarily concerns students who generally have constrained financial resources, price reductions are hypothesized to be stimuli that influence purchasing behavior. Another external stimulus that was selected was the ambiance of the online store, as Generation Z predominantly makes fashion purchases via e-commerce platforms or social media.

The existing literature identifies fashion involvement, hedonism, and normative influences as internal stimuli that contribute to the emergence of impulsive fashion consumption.(Keegan et al., 2021). Higher interest in fashion will increase positive emotions and the likelihood of impulsive purchases (Liapati et al., 2015). Pentecost & Andrews (2010) state that fashion-oriented consumers are more likely to purchase impulse to satisfy hedonistic preferences such as style and image. Related to the characteristics of Generation Z, who tend to follow fashion and lifestyle trends, fashion involvement is the right choice as a proxy for organisms. Based on this exposure, the model predicts the impulse buying behavior of fashion products listed in Figure 1. Thus, the major hypothesis that can be developed in this research model is that i*mpulse buying of fashion can be predicted based on discount prices and store atmosphere with fashion involvement as an intervening variable.*

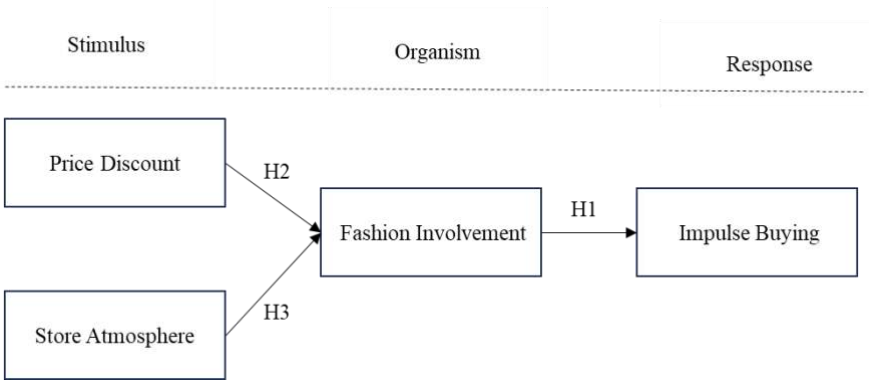

Figure 1. Research Model

2.3. Fashion Involvement

Fashion involvement is consumer involvement in a fashion product driven by the need and interest in the product (O'Cass, 2004; Zhang & Kim, 2013). Customers who are highly engaged in fashion trends form positive attitudes and tend to buy products that provide the desired social prestige (Deeter-Schmelz et al., 2000; Summer et al., 2006). Another definition states fashion involvement refers to consumer interest in fashion and is an essential dimension of consumer lifestyle that influences purchasing decisions and consumption behavior (Naderi, 2013; Nam et al., 2007).

Several studies on Indonesian consumers, in general, show a significant relationship between fashion involvement and impulse buying (Pramestya & Widagda, 2020; Tirtayasa et al., 2020; Wayan et al., 2023). Cengiz (2017) also showed the same findings in Turkey and Liapati et al. (2015) in Korea. However, there are different findings put forward by Dewi et al. (2015), who state that fashion involvement has no significant effect on impulse buying. Related to the characteristics of Generation Z, who always follow trends and lifestyles (Johnson & Im, 2014; Razzaq et al., 2018; Slater & Demangeot, 2021)), and involvement with a product will increase the activity of obtaining the product (Zhang & Kim, 2013) so the tendency to impulse buying is higher. This phenomenon is also reinforced by Pentecost & Andrews (2010), who state that fashion-oriented consumers are more likely to make impulse purchases. This can be constructed through minor hypotheses:

> *H1: Fashion Involvement has a positive and significant relationship with impulse buying in fashion products*

2.4. Price Discount

Price is commonly regarded as a determinant of purchasing choices (Büyükdağ et al., 2020; Çavuşoğlu et al., 2020; Sheehan et al., 2019). Sellers may employ a discount price strategy to stimulate impulsive purchases (Lee & Chen, 2021; Lin et al., 2022; Peng & Kim, 2014). The magnitude of the discount affects purchase intentions dynamically over an online shopping experience, indicating that consumers enjoy the process of finding and using discounts (Sheehan et al., 2019). In online shopping, consumers always look for the best deals, as the price is an attractive stimulant in this environment (Aiolfi et al., 2022; Atulkar & Kesari, 2018). Discounts can be considered an incentive to get people to shop, making shopping more enjoyable and satisfying (Lee & Chen-Yu, 2018). Discounts can enhance the emotional experience of online shopping and stimulate purchase intentions (Huo et al., 2023; Lee & Chen-Yu, 2018; Venkatesh et al., 2021).

Literature has not examined the direct relationship between discount and fashion involvement. But Alanadoly & Salem (2022) state price significantly moderates the relationship between

fashion involvement and product information. The findings of Mortimer et al. (2022) state that a person involved in fashion, in addition to having good information about the product, also knows how to acquire the product at a lower price. With limited literature, the relationship between price discount and fashion involvement can be built on the following minor hypotheses:

H2: Price Discount is predicted to have a positive and significant relationship with fashion involvement

2.5. Store Atmosphere

The store atmosphere is designed to influence customer mood and behavior (Ahmed & Ting, 2020; Albarq, 2021; Calvo-Porral & Lévy-Mangin, 2021; Xiao et al., 2022). The online store atmosphere includes web page design, navigation, colors, fonts, images, and videos (Zhao et al., 2022). These characteristics are expected to create a positive shopping experience, encouraging customers to surf, shop, and buy products (Lin et al., 2022). An online store's interactivity and information technology (IIT) can affect consumer perception of the online retail environment, shopping enjoyment, and patronage behavior towards online retailers (Kim et al., 2007).

Online media that contain information and images play an essential role in fashion involvement. Visual information that allows clothing to be viewed from multiple angles and is cognitively processed faster than text (McCormick & Livett, 2012). This situation encourages hedonism Parboteeah et al. (2009) and hedonism tends to be responded to by impulsive purchases (Çavuşoğlu et al., 2020; Hashmi et al., 2020; Park & Lin, 2020). Another study states that fashion involvement is closely related to lifestyle, and this relationship will be further strengthened by exposure to the media (Sun & Guo, 2017). Similar findings were also stated by Celik & Kocaman (2017), that the readiness to use technology in online shopping significantly affects fashion involvement. Based on this literature, the following minor hypotheses can be built:

H3: Store atmosphere is predicted to have a positive and significant relationship with fashion involvement

2.6. Gender

Literature shows the influence of gender on impulse buying behavior (Atulkar & Kesari, 2018; Bhatia, 2019; Djafarova & Bowes, 2021). Different things are shown by Büyükdağ et al. (2020), which states that there is no gender difference in impulse buying behavior. Other literature says that women are more impulsive than men (Bratko et al., 2013), and there is a tendency for women to have higher fashion involvement than men (Lim & Park, 2011; Sun & Guo, 2017; Workman & Lee, 2011). Based on this literature, hypothesis 4 can be made as follows:

H4: There are differences in impulse buying behavior between men and women

3. METHODOLOGY

3.1. Sampling and Data Collection

The respondents of this study were students aged 18 to 22 years who had purchased fashion products on the e-commerce platform and Instagram social media. Data was collected using a questionnaire in the form of a Google form distributed to 30 WhatsApp class groups at a university in West Java. Data collection was carried out from August to December 2022. The research model (Figure 1) specifies that a minimum sample size of ten times the number of constructs in each variable is required (Hair et al., 2017). The number of indicators built as proxies for each construct is five items, so a minimum of 4 times 5 or 200 sample size is needed for this study. The number of participants that can be used during the distribution of the questionnaire is 444. Thus, a sample size of as many as 444 is considered usable in this study.

3.2. Research instruments and measurements

Price Discounts, Store Atmosphere, Fashion Involvement, and Impulse Buying are latent variables developed based on previous research. Each variable is measured using five items. Measurement of the Price Discount variable was adopted by Çavuşoğlu et al. (2020), the variable Store Atmosphere by Xiao et al. (2022), and Fashion involvement was taken by Keegan et al. (2021). Meanwhile, measurements for Impulse Buying are taken from Aiolfi et al. (2022) and Atulkar & Kesari (2018). The items on each latent variable were measured using a five-point Likert scale (1 = "strongly disagree"; 5 = "strongly agree"). Before data collection, questionnaires were tested against 30 samples in the population. All constructs are declared valid and reliable. Questions about gender and pages frequently used in fashion shopping were also included in the questionnaire.

3.3. Data Analysis

The PLS-SEM analysis technique was employed in this study due to its multivariate nature, which enables a simultaneous examination of all relationships between variables in the conceptual model, including structural and measurement components (Hair et al., 2019). The software used is SmartPLS 3.2.9. According to Hair et al. (2019), the measurement and structural models must be evaluated at PLS-SEM. The measurement model evaluates convergent validity, internal consistency, and discriminant validity, while the structural model assesses the predictive ability of the model based on R^2, Q^2, and path coefficients (Hair et al., 2019).

4. RESULT

4.1. Descriptif Data

Fashion purchases made by 202 men and 242 women on E-Commerce platforms and Instagram are listed in Table 1. Shopee and Instagram are two of the E-commerce platforms that are widely used to buy fashion. When viewed based on the distribution of gender in each online store, the type of store chosen by men and women to buy fashion is relatively no different.

Table 1. Distribution (%) of Online Stores by Gender

Online Shop	Shopee	Lazada	Instagram	Tokopedia	Zalora	Total
Female	23,20	3,38	24,10	2,70	1,13	54,50
Male	20,04	2,70	19,82	2,03	0,90	45,50
Total	43,24	6,08	43,92	4,73	2,03	100,00

4.2. Measurement Model

The first step in the measurement model evaluation is to evaluate the convergent validity of each item viewed based on the outer loading value. An item is declared reliable if the outer loading value is more significant than 0.708 (Hair et al., 2019). In this case, the value of all outer loadings is more significant than 0.708 (Table 2). The test continues to check the convergent validity value of each construct based on the Average Variance Extracted (AVE) value. An acceptable AVE value of 0.5 or higher states that the construct can account for at least 50% of the item's variance (Fornell & Larcker, 1981). Based on Table 2, it can be seen that the AVE value of each construct is at a value of 0.601 – 0.831.

The second step in the measurement model evaluation is to evaluate internal consistency, namely Composite Reliability (CR) and Cronbach alpha values (Hair et al., 2019). A construct is considered consistent if the CR value is more significant than 0.7 and the Cronbach alpha value (Hair et al., 2017). In this case, the CR and Cronbach alpha values are 0.796 – 0.879 (Table 2.)

Table 2. Convergent Validity, Internal Consistency, and VIF

	Construct/Items	Loading Factors	VIF	Cronbach'alpha	CR	AVE
	Price Discount			0,877	0,916	0,732
X1.1	When shopping, I look for day-of-the-week deals.	0,824	2,015			
X1.2	I like holiday sales at stores.	0,891	2,776			
X1.3	Special day discounts encourage me to buy.	0,875	2,508			
X1.4	On sale days, I check everything in the store.	0,829	1,960			
	Store Atmosphere			0,825	0,884	0,656
X2.1	The store feels welcoming.	0,768	1,622			
X2.2	The store is well-organized and accessible.	0,834	1,868			
X2.3	The product displays are visible.	0,852	2,038			
X2.4	The store provides concise product information.	0,782	1,673			
	Fashion Involvement			0,796	0,907	0,831
X3.3	I usually shop at online stores that specialize in the latest fashion	0,915	1,777			
X3.5	I usually have one or more outfits in the latest style	0,907	1,777			
	Impulse Buying			0,834	0,883	0,601
Y1	When shopping, I stick to my list.	0,779	1,721			
Y2	I often buy unplanned items when shopping.	0,808	1,880			
Y3	I buy things without planning to.	0,789	1,758			
Y4	It's fun to make a last-minute purchase.	0,772	1,717			
Y5	When I see something I like, I buy it without thinking.	0,727	1,569			

The next step is to evaluate the validity of the discriminant, which shows the extent to which a construct empirically differs from other constructs in the research model. One that can be used is the Fornell-Larcker criteria. Each statement will have the best quality when the correlation matrix shows that the first construct has a more significant correlation coefficient than the other constructs below it, and the second construct hints at the same thing (Fornell & Larcker, 1981). At this stage, one item on Price Discount and Store Atmosphere and three items on Fashion Involvement must be dropped to get a matrix according to the Fornell-Larcker criteria. Table 3 shows that the matrix formed already states that each construct differs.

Table 3. Measurement Model: Discriminant Validity Fornell-Larcker Criterion

	Price Discount	Store Atmosphere	Fashion Involvement	Impulse Buying
Price Discount	0,855			
Store Atmosphere	0,845	0,810		
Fashion Involvement	0,795	0,794	0,911	
Impulse Buying	0,663	0,690	0,689	0,775

4.3. Structural Model

Before analyzing structural relationships, collinearity should be checked to ensure that there is no bias in the regression results. Ideally, the variance inflation factor (VIF) value should be lower than 3 (Hair et al., 2019). In this model, all VIF values are smaller than 3, with a value range of 1.569 - 2.776 (Table 2).

The bootstrapping process using 10,000 sub-samples was used to evaluate significant indicators and path coefficient values (Hair et al., 2022). Evaluation of the model using the coefficient of determination (R^2), cross-validated redundancy (Q^2), and path coefficient (Hair et al., 2019). In this study, the R^2 value of 0.685 (Table 4) shows the strength of the influence of Price Discounts and Store Atmosphere on Fashion Involvement. Meanwhile, the R^2 value of 0.475 shows the effect of price discount, store atmosphere, and fashion involvement on impulse buying.

Further, to assess the accuracy of model predictions based on empirical data, the value of Q^2 is calculated (Hair et al., 2019). The Q^2 value for Fashion Involvement is 0.561, and the Q^2 for Impulse buying is 0.282 (Table 4). Based on these results, Fashion Involvement can be predicted well based on Price Discounts and Store Atmosphere, while Impulse Buying predictions based on Fashion Involvement are moderate.

Table 4. Structural Model

	Coefficient	P Values	Coefficient of determination (R^2)	Predictive Relevance (Q^2)
Price Discount -> Fashion Involvement	0,434	0.000	0,685	0,561
Store Atmosphere -> Fashion Involvement	0,427	0.000		
Fashion Involvement -> Impulse Buying	0,689	0.000	0,475	0,282

Testing of hypotheses is expressed based on path coefficients, as shown in Table 4. The relationship between Price Discount and Fashion Involvement of 0.434 is significant because the p-value is smaller than 0.05. Thus, Hypothesis 2 is acceptable. A significant relationship was also shown in the Store Atmosphere variable to Fashion Involvement (H3) and Fashion Involvement to Impulse Buying (H1). Thus, all hypotheses are acceptable, meaning a significant relationship exists between all exogenous variables and their endogenous variables.

Table 5. Multi-Group Analysis by Gender

	Path Coefficients-diff (Pria - wanita)	P Values
Price Discount -> Fashion Involvement	-0,055	0,323
Store Atmosphere -> Fashion Involvement	0,087	0,240
Fashion Involvement -> Impulse Buying	0,153	0,002

The results of multi-group analysis based on gender found no difference between men and women in the relationship between Price Discount and Fashion Involvement, which was realized with a p-value greater than 0.05. Likewise, with the relationship between Store Atmosphere and Fashion Involvement. Different results are shown in the relationship between Fashion Involvement and Impulse Buying, which states there are differences in Impulse Buying behavior between men and women. Based on these results, hypothesis 4 is acceptable.

5. DISCUSSION

This research proves that the impulse buying behavior model towards fashion products in Generation Z is acceptable. These findings confirm the framework model proposed by Keegan et al. (2021). When viewed based on the results of statistical tests in Table 4, the Price Discount and Store Atmosphere are pretty strong in influencing Fashion Involvement, with an R^2 of 0.685. This result shows that the push for fashion needs will increase with the stimulation of discounted prices and online shopping media with a welcoming, easily accessible display and clear product information. Meanwhile, discount prices, store atmosphere, and fashion involvement affect impulse buying with an R2 value of 0.475.

Partially, Fashion Involvement has a significant effect on impulse buying. This finding is in line with Cengiz (2017), Liapati et al. (2015), Pramestya & Widagda (2020), and Wayan et al. (2023). The influence of this variable on impulse buying is quite significant, at 0.689 (Table 4). This can be explained as follows: Generation Z, with characteristics sensitive to trends and lifestyles, tends to fulfill their fashion needs for the latest fashion, triggering impulse purchases.

Price discounts have a significant effect on Fashion Involvement. Although no literature has been found that shows the same relationship, in general, the findings of this study do not contradict previous studies. For example, Mortimer et al. (2022) state that consumers with high engagement with fashion tend to know product price and value better. They tend to buy products at a discount if they believe that the product has good value. Generation Z, who in this study are students, generally have limited money, so price discounts are sensitive. Discounts incentivize them to purchase fashion products immediately (Kim et al., 2007; Zhou et al., 2018). They are satisfied because they feel they have obtained savings with the difference in purchase price (Flavian et al., 2020; Mayhoub & Rabboh, 2022). With discounts, they can fulfill the desire to follow fashion at a lower product value. Thus, discount offers on social media and e-commerce pages can allegedly increase involvement in fashion.

The results of statistical tests show that store atmosphere significantly affects fashion involvement (Table 4). This result is in line with the findings of McCormick & Livett (2012) and Sun & Guo (2017), which state that online media can increase engagement in fashion. Practical product layout and placement can stimulate consumers to browse more products (Sharma & Bumb, 2022; Shoenberger & Kim, 2019). In addition, product visualization well increases sensation in shopping (Chang et al., 2023; Kim et al., 2007; Krasonikolakis et al., 2018). Another thing is that Generation Z, who grew up with technology and social media, and shopping experiences are often associated with self-expression (Lee & Chen, 2021), so this situation tends to create engagement with the product.

This research shows that the effect of discounts and online store displays on fashion engagement between men and women is no different. This finding is different from that proposed by Sun & Guo (2017), which also looked at the relationship of media exposure to fashion involvement in participants aged 18 to 30 years. Discrepancies in these findings are likely due to the skills in processing information in online stores in Generation Z, known as digital natives. So, in general, men and women respond equally to the stimulation of discounts and online media activities. In comparison, there are differences in impulse buying behavior between men and women influenced by fashion involvement. This phenomenon is alleged because women are more involved in fashion than men (Lim & Park, 2011; Sun & Guo, 2017; Workman & Lee, 2011), so they tend to respond to impulse purchases.

6. CONCLUSION AND IMPLICATION

This research shows that price discounts and store atmosphere can predict impulse buying through fashion involvement. These findings indicate that an excellent online store atmosphere, in the form of a welcoming display, easy page navigation, accurate product information, and visualization, will trigger impulse purchases. In addition, an effective strategy in offering discounts can encourage impulsive behavior.

This study also shows differences in impulse buying behavior between men and women. Following the previous literature, women tend to have higher fashion involvement than men, so fashion trends, especially women's fashion, must continuously be updated by marketers.

This finding is an input for marketers, the first to maintain the atmosphere of their online store. The presence of online stores packaged as if consumers are shopping at offline stores needs to be considered. One alternative that can be done is a live sale where interaction between buyers and marketers can be done directly. In addition, it utilizes technology that allows product images to look real so that it seems as if consumers can hold and try the product.

Another thing that can be input for marketers is how to set the right price promotion strategy. Flash sales on specific dates will encourage impulse buying because consumers are limited to a limited time, so they cannot consider well whether the product offered is needed. On the other hand, business people are still responsible for educating their consumers to be wise in buying products. One form of education that can be provided is, for example, providing honest and accurate information about a product.

7. LIMITATIONS

This research has not specifically determined the fashion products that are the object of impulse buying carried out by participants. Different behavior towards shirts, bags, shoes, or accessories is possible. This point is important to note, considering that in online purchases, the object of purchase, the preference of men and women, is usually different (Pascual-Miguel et al., 2015). Both men and women have quite different perceptions of deepening the introduction of product details (Lin et al., 2019; Yi, 2022).

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The Effect of Leader-Member Exchange on Psychological Entitlement and Organizational Silence: The Mediator Role of Psychological Contract Breach

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Abstract

This study investigates the impact of leader-member exchange on psychological entitlement as well as organizational silence, focusing on the mediating identity of psychological contract breach. Utilizing a correlational model within the general screening framework, an online survey was administered to 294 white-collar employees selected through convenience sampling. The results have revealed that, the leader-member exchange has a negative significant impact on psychological contract breach, the leader-member exchange has a notable negative effect on organizational silence, psychological contract breach has a positive substantial effect on psychological entitlement, and psychological contract breach has a significant negative effect on organizational silence. Psychological contract breach mediates the leader-member exchange and organizational silence relationship. Leader-member exchange does not affect psychological entitlement substantially, and psychological contract breach does not mediate the leader-member exchange and psychological entitlement relationship. As a result, the excellence of leader-member exchange and the psychological contracts made with the organization directly impact employees' behavior.

Keywords: Leader-member exchange, psychological entitlement, organizational silence, psychologi-cal contract breach.

1. INTRODUCTION

Leader-member exchange (LMX) theory, originating in early 1970s, emphasizes the excellence of the dyadic relationships between leaders and followers, marking a shift from traditional leadership models by incorporating the follower's role in leadership processes. Positive results are linked to excellent LMX quality such as increased citizenship behavior, job satisfaction, loyalty, and performance (Gerstner and Day, 1997). The theory posits that leadership varies for each leader-follower relationship, challenging the notion of a uniform leadership style. Leaders

often form differentiated relationships within their teams, leading to the formation of in-groups and out-groups. Members of the group receive more trust as much as attention, whereas out-group members may experience formal, less personal interactions. This differentiation can influence communication patterns, with out-group members potentially exhibiting higher levels of organizational silence. Studies suggest high-quality LMX relationships can reduce organizational silence by fostering open communication (Ai-Hua et al., 2018). However, the nexus between LMX and psychological contract breach (PCB) is complex. Some research indicates that strong LMX can buffer the negative impacts of PCB. Furthermore, other studies suggest that employees may react more negatively to PCB when the quality of relationship is high with their leaders (Doden et al., 2018). Leaders serve a crucial role in forming employees' attitudes towards the psychological contract, and effective LMX can enhance these perceptions, leading to longer-term employment relationships and increased organizational efficiency (Collins, 2010).

2. LITERATURE REVIEW

2.1 Leader-Member Exchange (LMX)

For nearly fifty years, the Leader-member exchange (LMX) theory was the subject to many different studies and has been updated. LMX relationships employ the characteristics of shared trust, respect, as well as shared influence (i.e., high LMX or in-group) versus those that relied merely on contracts of formal employment (i.e., low LMX or out-group) (Liden and Maslyn, 1998). (1975) stated that these studies are based on two main assumptions, which need to be revised to explain Leader-member exchange. The first assumption suggests that the perceptions, comments, and reactions of team members reporting to the same leader are common. The second assumption suggests that a leader treats every team member similarly (Dansereau et al., 1973). Therefore, the leader and the work group relationships are focused on average and typical behaviors. What was initiated regarded as an option to the ordinary style of leadership (Vertical Dyad Linkage) evolved into a suggestion for creating leadership in a more efficient way in developing and sustaining advanced leadership. In the process, the theory was acknowledged for various analysis levels such as focusing on differences inside the groups (group-level effect) as well as focusing on dyads independent from groups (dyad-level effect), and much more lately, has focused on the integration of dyads within networks along with groups (Graen and Uhl-Bien, 1991; Graen and Uhl-Bien, 1995). As Dansereau, Graen, and Haga (1975) suggested, leader-member relations are diversified; the interactions inside a business unit differ, and every leader-member relationship becomes an interpersonal kind of a relationship which is one of its kind within an organizational structure. Consequently, the analysis unit in leadership is the interrelationship as a substitute of the workgroup or individual. The leader and the member are analysis units at the dyad level vertically, and all are essential for the leadership process studies.

Leader-member exchange (LMX) theory is grounded in role and social exchange theories. According to role theory, the development of roles within organizations involves interactions between leaders and members and among peers, contributing to role formation and expectations. LMX quality emerges from a negotiated rule-making process, where mutual testing of loyalty and competence is essential for establishing high-quality exchanges. This process unfolds over three stages; role taking, role making and role routinization (Dienesch and Liden, 1986).

This progression underscores the dynamic nature of leader-member interactions and highlights the importance of reciprocal influence in role development. Dienesch and Liden (1986)

developed the LMX model as "contribution" (the quantity, tendency, and excellence of work-focused enterprise that all members put forward for the common objectives of the relationship), "loyalty" (support provided to third parties) and "affect" (the contribution of members to each other). The emotional closeness they feel towards each other) dimensions. However, further studies have revealed that adding one more dimension to the model (professional respect) will better explain LMX (Liden and Maslyn, 1998). In many recent studies on LMX, it is observed that the framework put forward by Dienesch and Liden (1986) as well as the four-dimensional structure developed by Liden and Maslyn (1998) based on this framework are taken as a basis, and a common acceptance has begun to form on this issue (Baş et al. .2010).

2.2 Psychological Entitlement

Psychological entitlement stands for a rather stable belief that people should access the desired approach along with a small regard for one's actual deservingness (Naumann et al., 2002). Psychological entitlement has been expressed as a component of narcissism in literature. However, Campbell et al. (2004), stated the psychological entitlement associated with narcissism would only include the experience of "deserving," but it is necessary to address the experience of "earning rights" as well as deserving. Both terms indicate that a reward or different desirable result is owed to the person, but the origin of the outcome is different. Particularly, deservingness is commonly mirrored by the expectation of a reward as a consequence of individuals'endeavor or character. In contrast, entitlement is usually linked to a reward expectation as a consequence of a social contract. For instance, stating that you are entitled to social security payments instead of you have received a benefit regarding social security payments would be more definite. Similarly, it would be more precise to claim that one would deserve a good salary because they work hard than to say that one would deserve a high salary because they worked hard. However, if a person in this situation claims that he or she deserves social security benefits or is meant to have a high salary, the meaning is broadly preserved. Therefore, they included both terms when creating their scales and evaluated them similarly.

Naumann et al. (2002) addressed perceptions of psychological entitlement as "rights that an individual contributing to an employment relationship expects resulting from that relationship." The scholars demonstrated that this definition would focus on expectations arising from joining in a social contract and not performing as an employee. As instance, organizational members may sense that they have insurance as well as retirement rights for being the employees of a particular organization, not due to taking how they performed as basis. With such an opinion, Naumann et al. (2002) suggested entitlement feelings would stem from skewed evaluations of give-and-take. Individuals with solid perceptions of entitlement long for organizational appraisals as well as compensation with no need to respond by reaching high level performance.

2.3 Organizational Silence

Organizational silence is a new concept in the literature and was initially brought by Morrison and Milliken in 2000. Morrison and Milliken (2000) viewed organizational silence as a "collective" phenomenon. "Why silence?" In workplace sociology, they argued that silence turns into a collective behavior when most organizational members prefer to keep silence on organizational issues rather than the individual psychology of employees. Employee silence is defined as not giving any natural sense of individuals' behavioral, cognitive, and/or emotional evaluations of their organizational situation to those considered to be able to affect change (Pinder and Harlos, 2001).

Organizational silence is grouped under three headings. Employees in a state of acquiescent and defensive silence may avoid communicating even though they have information because they have already admitted the status quo. They keep to themselves the ideas, information, and opinions that will improve and improve their work and organizations, with the motivation to consent. Therefore, they are hesitant to discuss or alter the status. Opportunistic silence defines the employees that prefer to keep their beliefs, information, and opinions regarding the businness to themselves for self- protection. In order to protect themselves, the employee may act as if their existing problems do not exist, hide personal mistakes, or choose not to convey different views and ideas. Pro-Social/organizational silence stands for employees hiding their work-related ideas, in-formation, and opinions for the goodness of organization along with other employees (Van Dyne et al., 2003). They define it like employees thinking about others rather than themselves or not expressing their feelings, information, and opinions about their work and organization. In order to benefit the organization or other individuals due to collaborative reasons. In this type of silence, it is essential not to share what you know under any circumstances because it is for the organization's or others' benefit. The main reasons for silence in organizations are as follows (Shojaie et al., 2011):

- Many view silence as the speech vacancy, therefore, lack of action. When no speech exists, the absence of behavior is not noticeable and does not attract attention.
- Regarding this first point, the behavior absence is harder to examine than behavior that is more obvious and obvious (Van Dyne, 2003).
- Due to silence's latent or subjective nature, it becomes easier to determine quality or quantity with an appropriate lens to recognize or interpret it.
- The hierarchy of organizational structures and power suggests that employee silence may occur far from senior management's perception and hinder management awareness.

As a consequence remaining silent impacts the organization and employees negatively. The organizational consequence of silence is not benefiting from the intellectual contributions of employees, suppressing problems, and neglecting negative feedback. Such behaviors can hinder healthy decision-making, progress/recovery, and increased performance. The adverse effects of silence on employees are that employees feel weak in expressing their problems and concerns about the workplace and that their feelings of commitment to the organization, belonging and trust, admiration, and support decrease. In addition, remaining silent about issues that the employee knows and is good at causes the employee to suffer and feel helpless and worthless (Çetin, 2014).

2.4 Psychological Contract Breach

In order for describing intertwining of the power of perception and the values held by both sides of the employment relationship (the organization and the individual), Argyris (1960) conjoined the term "psychological contract" (Cullinane, 2006). Significantly, this older literature illustrates that employment relations are shaped by social and economic exchange (Fox, 1974). The psychological contract was perceived as framework to explain the employment relationship and the impact from structural organizational replacements like downsizing (Parks and Kidder, 1994). The definition is provided as people's constructed understandings by the organization about the exchange agreement conditions with the organization as well as the individual (Rousseau, 1995). Levinson et al. (1962), who had significant contributions to the development of the concept initially, introduced the psychological contract like "the sum of common expectations of the employee along with the organization." Schein (1980) gives a

similar definition: "an unwritten set of mutual expectations of the employee with the organization he is in." The employee's perception framework towards what he owes to his employers and what they will receive from him forms the basis for the notion of psychological contract. Based on these definitions, defining the psychological contract as a dynamic, unwritten total of expectations based on reciprocity between the employee and the organization would be possible (Cihangiroğlu and Şahin, 2010).

Rousseau (1995) categorized psychological contracts within four types: transactional, relational, balanced, and transitional. Contracts that are transactional are characterized by limited, strictly defined agreements primarily focusing on economic exchange, lacking emotional involvement and trust. Relational contracts, conversely, encompass socioemotional elements like loyalty and support, fostering long-term, open-ended relationships between employees and organizations. Balanced contracts integrate aspects of both transactional and relational contracts, featuring open-ended arrangements concerning performance-reward contingencies. Transitional contracts denote a state where no explicit agreement exists between parties, often arising from unstable conditions such as significant organizational changes. This leads to a lack of commitment from both sides. Despite this fourfold classification, measurement challenges and overlaps between transactional-transitional and relational-balanced contracts have led researchers to focus primarily on transactional and relational types in empirical studies (Jamil et al., 2013).

Psychological contract breach, which can be defined as employee's feelings as if the organization has declined fulfilling the promises it had given (Robinson and Rousseau, 1994), is a central concept in comprehension of employment relationships and employee behavior. Through interactions and observations, employees form beliefs about common obligations with their employers (Rousseau and Parks, 1993). However, psychological contract breaches occur when organizations fail to meet these perceived obligations (Gakovic and Tetrick, 2003). Robinson and Rousseau (1994) found that 55% of managers felt their organization had not fulfilled promised obligations within the initial two years of employment. Such breaches can diminish employees' trust, job satisfaction, commitment, and performance while increasing turnover intentions. Given these potential adverse outcomes, understanding the conditions that paves the way to the perceptions of psychological contract breach is crucial (Robinson and Morrison, 2000).

3. METHODOLOGY

3.1 Sampling and Data Collection

The research population consists of white-collar employees in Turkey. In order to obtain more comprehensive findings and more generalizable results by ensuring sample adequacy by examining the demographic characteristics of the participants, a survey form containing the demographic information form and scale was applied online to 294 white-collar employees who were reached online by convenience sampling method.

Participation in the study, in which the easy sampling method was chosen, was based on the participation of volunteers. Similarly, this methodology is adopted by Sedgwick (2013) as well as Kemper et al. (2003). Google form survey began with an intent message explaining the final research goal on the first page to ensure confidentiality. In this direction, the confidentiality of the study, the researcher's responsibility, and aims of the study were given, and permission of data collection was demanded. Each employee received survey link via email sent to their official electronic email address. As a result, 300 surveys were distributed, and 294 responses were received.

3.2 Research Design

In order to reach a common sense about a setting including a large number of people in order to find answers to the research questions, the general screening model, which allows singular or relational scans over the entire setting or sample group or samples to be retrieved from there, was preferred. The correlational model, one of the quantitative re-search models, was used to assess the variables' relationship within the research scope.

3.3 Research Model

This article initially aimed to explore the impact of LMX on psychological entitlement and organizational silence along with the psychological contract breach's mediating role in this relationship. We investigated this mediation model of direct and indirect effects through the path analysis, as presented in Figure 1.

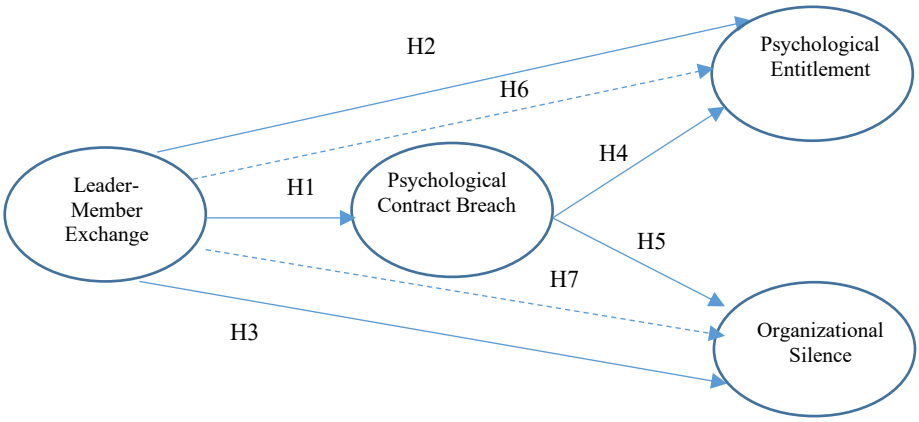

Figure 1. Conceptual model of the hypotheses

Hypotheses

Direct effects hypotheses

H1: Leader-member exchange has a significant effect on psychological contract breach

H2: Leader-member exchange has a significant effect on psychological entitlement

H3: Leader-member exchange has a significant effect on organizational silence

H4: Psychological contract breach has a significant effect on psychological entitlement

H5: Psychological contract breach has a significant effect on organizational silence

Hypotheses of indirect effects

H6: The relationship between leader-member exchange and psychological entitlement are mediated by psychological contract breach. Mediation of psychological contract breach eliminates that significant effect of leader-member exchange on psychological entitlement

H7: Psychological contract breach moderates the leader-member exchange and organizational silence relationship. The strong impact of leader-member exchange on organizational silence is eliminated through psychological contract breaches

Research question

Does psychological contract breach have a mediating role in the effect of leader-member exchange on psychological entitlement and organizational silence?

3.4 Scales

Leader-Member Exchange: Leader-member exchange was tested by the Lead-er-Member Exchange Scale developed and validated by Baş, Keskin, and Mert (2010).

Psychological Entitlement: Psychological entitlement was tested with the Psychological Entitlement Scale developed and validated by Kürü (2022).

Organizational Silence: Organizational silence was tested with the Organizational Silence Scale, developed by Knoll and Dick (2012) and adapted into Turkish and validated by Çavuşoğlu and Köse (2019).

Psychological Contract Breach: Psychological contract breach was measured by the Psychological Contract Breach Scale, developed by Robinson and Rousseau (1994) and adapted into Turkish by Örücü and Bayramov (2022).

Table 1. Mean Scores, Standard Deviation Scores and Correlations of The Variables in The Study

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Effect	3,38	1,11	(0,92)										
2. Loyality	3,32	1,04	0,740**	(0,89)									
3. Contribution	3,49	1,00	0,579**	0,594**	(0,82)								
4. Professional Respect	3,54	1,13	0,750**	0,676**	0,592**	(0,93)							
5. LMX	3,43	0,92	0,896**	0,872**	0,794**	0,883**	(0,94)						
6. Psychological Entitlement	4,54	1,31	-0,069	-0,037	0,010	-0,049	-0,044	(0,85)					
7. Acquiescent/Defensive Silence	2,43	0,89	-0,222**	-0,256**	-0,233**	-0,212**	-0,267**	0,074	(0,93)				
8. Opportunistic Silence	2,16	0,89	-0,115*	-0,168**	-0,153**	-0,097	-0,153**	0,094	0,654**	(0,84)			
9.ProSocial/ Organizational Silence	2,75	1,05	-0,033	-0,024	-0,003	-0,0037	-0,029	0,018	0,666**	0,526**	(0,81)		
10.Organizational Silence	2,45	0,81	-0,137*	-0,165**	-0,142*	-0,128*	-0,165**	0,069	0,890**	0,829**	0,866**	(0,94)	
11. Psychological Contract Breach	2,81	0,95	0,597**	-0,545**	-0,512**	-0,593**	-0,653**	0,157**	0,246**	0,169**	0,093	0,191**	(0,93)

As presented in Table 2, the CFA outcomes showed the indices of general goodness of fit for the hypothetical model would fit well with the data, and the evaluation of these variables given in the models has been satisfactory (X2/sd<3; GFI ≥0.90, TL ≥ 0.90, CFI ≥0). .90, NFI ≥0.90, RMSEA ≤ 0.08). While indices of all fit exceed 0.90, the value of RMSEA is below 0.09 (MacCallum et al., 1996). Convergent validity was also supported, since all factor loadings were statistically significant (Hair et al., 2010). Also, as indicated by Fornell and Larcker (1981), the mean-variance subtracted (AVE) value for all constructs was greater than 0.50, and the composite confidence levels for each construct exceeded 0.70.

Table 1. Validity of Convergence of The Measurement Model

Structure	Number of Items[1]	X^2/sd	GFI	TLI	CFI	NFI	RMSEA	AVE	CR
LMX	4	2,756	0,93	0,94	0,96	0,94	0,077	0,58	0,94
Psychological Entitlement	6	2,595	0,97	0,96	0,98	0,97	0,074	0,50	0,85
Organizational Silence	3	2,776	0,91	0,94	0,95	0,93	0,078	0,59	0,95
Psychological Contract Breach	9	2,836	0,95	0,96	0,98	0,96	0,079	0,60	0,93

[1]: The number of items indicates the number of dimensions in leader member exchange and organizational silence scales.

As shown in Table 3, the Chi-square values of all model pairs alter from the critical values. Thus, the measurement model discriminant validity is confirmed.

Table 3. Discriminant Validity of Structure

Test	Explanation	X^2 restricted model	X^2 independent model	Difference[a]
1	LMX → Psychological Contract Breach	143,14	2784,46	2641,32
2	Psychological Cont. Breach → Psychological Entitlement	192,07	2698,36	2506,29
3	Psychological Contract Breach → Organizational Silence	97,83	2285,12	2187,29
4	LMX → Psychological Entitlement	84,40	1408,76	1324,36
5	LMX → Organizational Silence	32,86	1046,39	1013,53

Note: [a] All values are significant at $p < 0.01$.

Hypotheses were generated to test the negotiating role of the perception of "psychological contract breach" between "leader-member exchange" perception and attitudes of both "psychological entitlement" and "organizational silence." To scrutinize this mediating impact of psychological contract breach, we carried out path analyses of direct as well as indirect effects. The direct effect analysis scrutinizes not only for the presence of significant relationships between the independent variable (leader-member exchange) and the mediator (psychological contract breach) against the dependent variables (psychological exclusivity and organizational silence) but also for the presence of meaningful mediator relationships of the independent variables. Indirect effects analysis tests the elimination of direct effects of the independent variables on the dependent variable due to the mediator's overshadowing effect (Baron and Kenny, 1986). According to path analysis in Table 4, the leader-member exchange and psychological contract breach relationship is statistically significant and negative. The leader member exchange and organizational silence relationship is statistically significant and negative. The leader member exchange and psychological entitlement relationship is not significant. Accordingly, the H2 hypothesis was rejected, H1 and H3 hypotheses were accepted. The psychological contract breach and psychological entitlement relationship and psychological contract breach as well as the organizational silence is statistically significant and positive. Accordingly, hypotheses H4 and H5 were accepted.

Table 4. Test Results of Structural Equation Modelling for Direct Effects

Hypothesis Number	Direct Effect	Standardized path coefficient (β)
H1 Accepted	LMX → Psychological Contract Breach	-0,698*** (t=-10,323)
H2 Rejection	LMX → Psychological Entitlement	-0,062[ad] (t=-0,936)
H3 Accepted	LMX → Organizational Silence	-0,260*** (t=-4,104)
H4 Accepted	Psychological Contract Breach → Psychological Entitlement	0,173** (t=2,659)
H5 Accepted	Psychological Contract Breach → Organizational Silence	0,236*** (t=3,673)

Notes: *p < 0,05; **p>0,01; *** p < 0,001 [ns]: Not significant

Hypothesis outcomes for direct effects:

H1 Accepted: Leader-member exchange has a significant negative impact on psychological contract breach

H2 Rejection: Leader-member exchange has no significant effect on psychological entitlement

H3 Accepted: Leader-member exchange has a significant negative effect on organizational silence.

H4 Accepted: Psychological contract breach has a significant positive effect on psychological entitlement

H5 Acceptance: Psychological contract breach has a positive significant effect on organizational silence.

It was found that the direct effect of the independent variable, that is, "leader-member exchange" on organizational silence, was negative and significant (β = -0.260; p < 0.001), whereas the direct effect of "leader member exchange" on psychological entitlement did not have a significant effect (β = - 0.062; p > 0.05). We then analyzed the same independent variable (leader-member exchange) for its direct effects on psychological contract breach, and this effect (β= -0.698, p < 0.001) was found to be negative and significant. The mediator variable, perception of psychological contract breach, was found to be positively and significantly related to both psychological entitlement (β = 0.173, p < 0.001) and organizational silence (β = 0.236, p < 0.001).

Table 5 shows the SEM results examining the indirect impacts of evaluating the negotiating role of psychological contract breach in the relationships between leader member exchange, psychological entitlement, and organizational silence. 390.849 X^2 value and fit indices (X^2 /sd=1,954; GFI = 0,90; CFI = 0,94; NFI = 0,90; TLI = 0,94; RMSEA = 0,057) indicates compatibility. According to this model, the independent variable impact on psychological entitlement was still found not to be significant. The H6 hypothesis is not accepted. In other words, a psychological contract breach does not mediate the leader-member exchange and psychological entitlement relationship. The significant effect of the independent variable on organizational silence in the independent model is not significant in the model with mediator variables, and the H7 hypothesis is accepted. In other words, psychological contract breach is mediating the leader member exchange and organizational silence relationship.

Table 5. Test Results of Structural Equation Modelling for Indirect Effects

Hypothesis No.	Hypothesis	Standardized path coefficient (β)
H6 Rejection	LMX → Psychological Entitlement	0,109[ad] (t=1,110)
H7 Accepted	LMX → Organizational Silence	-0,177 [ad] (t=-1,887)

Hypothesis results of indirect effects:

H6 Rejection: Psychological contract breach does not mediate the leader- member exchange and psychological entitlement relationship.

H7 Acceptance: Psychological contract breach is mediating in the leader- member exchange and organizational silence relationship. The notable effect of leader- member exchange on organizational silence was eliminated by the mediation of psychological contract breach (The significant effect of leader-member exchange on organizational silence is not significant in the mediator variable model).

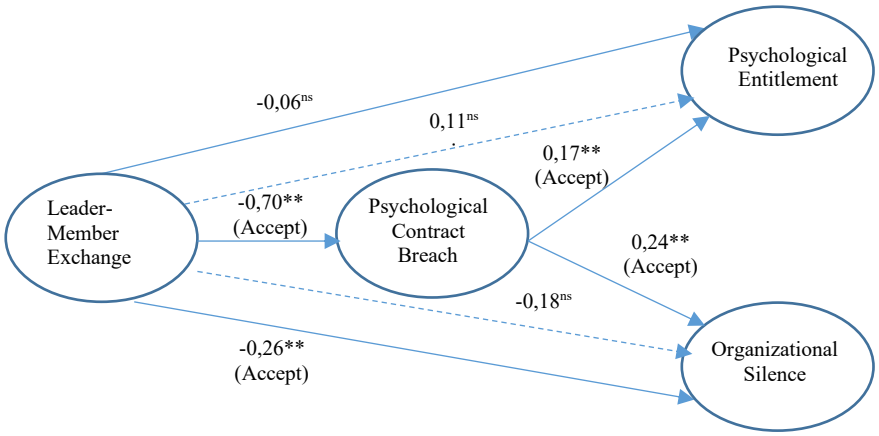

Figure 2. Structural Equation Modeling Results

LMX has a significant negative effect on psychological contract breach and organizational silence. Psychological contract exchange has a positive significant effect on organizational silence. Psychological contract breach mediates the leader- member exchange and organizational silence relationship. The mediation of psychological contract breach eliminated the significant effect of LMX on organizational silence (The significant effect of LMX on organizational silence is not significant in the mediator variable model). Hypotheses H2 and H6 were rejected. LMX exchange does not affect psychological entitlement significantly, and psychological contract breach does not have a mediating role in the LMX and psychological entitlement relationship.

Although employees accept different parties in the organization as responsible for providing specific incentives, they hold the entire organization responsible in psychological contracts (Shore et al., 2004). For example, while prioritizing the organization's responsibility in health services, salary system, and fringe benefits, they recognize that their managers are responsible for fair control, autonomy, and recognition. As a result, many researchers have suggested that employees have a psychological contract with the organization as a whole and their direct managers (Baccili, 2001; Shore et al., 2004; Griep et al., 2016). Our research results support research (Restubog et al., 2010; Chen and Wu, 2017; Erkutlu and Chafra, 2013; De Ruiter, 2017) showing that psychological contracts made with managers decrease the adverse impacts of other psychological contract breach elements, high quality leader- member exchange, it affects the perspective of the organization positively. Therefore, the impact of leaders on employee commitment, performance, productivity, and turnover intentions may be more effective than other factors in the organization as a whole.

Research results show that LMX is perceived differently between the in-group and the out group and that the group that is considered the in-group and communicates more closely with the leader feels relatively more entitled, and their motivation increases (Vidyarthi et al., 2010;

Henderson et al., 2009; Hu and Liden, 2013), our study concluded that the leader- member exchange excellence did not have a significant impact on psychological entitlement. It can be thought that the lack of distinction between in-group and out-group results in this result. However, in some cases, the high excellence of leader-member exchange may negatively affect performance and perception of justice by causing an entitled status perception (Matta and Van Dyne, 2015; Scandura and Lankau, 1996). An employee who sees himself as entitled may reduce his effort, and other employees may perceive that they are working with an unfair leader. This situation may cause a loss of performance for the individual, the entire group, and the organization over time.

Our other important finding is LMX has a negative significant effect on organizational silence, goes in line with previous research results (Çöp and Öztürk, 2017; Ai-Hua et al., 2018; Koçak and Çınar, 2020). According to this result, it can be stated that if the quality of LMX increases, organizational silence will decrease. The leader's active listening, trusting relationship with the employees, and attitude toward solving problems will cause the employees to be more sensitive to the problems and act with a participatory approach that will benefit the organization.

Positive answers to the questions reveal that the level of breach is low or does not exist. Therefore, questions evaluated positively by employees show that the level of breach is low, and when evaluated according to H4, a low or no psychological contract breach situation positively affects the perception of psychological entitlement. The perception of psychological entitlement, which is expressed as seeing oneself as superior to others and believing that they deserve high levels of reward and praise, regardless of the person's actual performance, is a source of concern for managers (Campbell et al., 2004; Harvey and Harris, 2010). We found a finding that supports research (Priesemuth and Taylor, 2016; Hobfoll, 2001) showing that employees with a high perception of psychological entitlement respond more negatively to psychological contract breach. In conclusion, this positive evaluation increases. The perception of psychological entitlement of an employee who accepts his psychological contract as positive and positions himself differently from others.

Psychological contract breach, when the employee believes the organization does not fulfill its promises, is one of the most critical factors affecting the work relationship and employee behavior (Robinson and Rousseau, 1994). When employees voice their concerns and feel unable to correct a contract breach committed by their organization, they may stop speaking out (Morrison and Milliken, 2000). According to our research results, organizational silence decreases when psychological contract breach is low or absent. This result supports other research on the subject (Sepahvand et al., 2020; Bari et al., 2020; Tomprou and Bankins, 2019; Varma and Sivarajan, 2023).

In testing our H2 hypothesis, we concluded that, unlike past research, leader- member exchange does not have a notable effect on psychological entitlement. Similarly, when the H6 hypothesis was tested, it was determined that psychological contract breach did not have a mediating role in given relationship. As far as these results are concerned, the conclusion could be made as the interaction with the leader of an employee who already sees himself as privileged does not have a significant effect on his positive perception of himself, but the excellence of his relationship with the leader in his relationship with the organization causes organizational silence (H3 hypothesis). However, in the H7 hypothesis, the negative effect of leader-member exchange on organizational silence is not related to psychological contract breach significantly. It was concluded that the excellence of the leader and the member relationship prevents organizational silence, but breach

of the psychological contract made by the member with the whole organization may cause organizational silence.

Mean scores, standard deviation scores, coefficients of reliability (indicated in brackets), and zero-order correlations regarding the total of constructs are shown in Table 1. The scales operated in this article exceed the proposed reliability level (Cronbach, 1951); leader- member exchange is not significantly related to psychological entitlement. There is a negative and significant relationship between leader- member exchange, organizational silence, and psychological contract breach. Psychological entitlement and organizational silence are not significantly related, but psychological entitlement and psychological contract breach are positively and significantly related. Organizational silence and psychological contract breach have a positive significance.

Fornell and Larcker's (1981) criteria and the double-step approach by Anderson and Gerbing (1988) were adopted to assess discriminant validity. Once the constructs were validated and psychometric properties were obtained, confirmatory factor analysis (CFA) was conducted to measure reliability and validity using AMOS 22 on all testing tools operated in this article. CFA results showed that each factor loading was relatively strong and significant, providing proof of the validity of convergence (Bagozzi and Yi, 1988).

In following stage, path analysis was scrutinized to test the hypothesized model. To put it another way, leader-member exchange and psychological contract breach (mediating variable) were related to psychological exclusivity and psychological contract breach. To evaluate model fit, as recommended by Hu and Bentler (1999), the indices of multiple fit were preferred. Particularly for this context, to scrutinize the goodness of fit, model goodness of fit index (GFI), normalized fit index (NFI), comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square errors of approximation (RMSEA) and correct-ed X2 (X2). /degrees of freedom) was implemented (Hu and Bentler, 1999; Marsh et al., 1988; Marsh et al., 1996; Medsker et al., 1994; Tucker and Lewis, 1973).

4.CONCLUSION

As a result, the excellence of leader-member exchange along with psychological contracts made with the organization directly impact employees' behavior. Therefore, organizations need to analyze in detail, at individual and organizational levels, the psychological contracts they make with employees, which they often need to be made aware of, in addition to their written employment contracts. Understanding which factors affect employees organizationally and cause silence and minimizing these factors will contribute to the free transfer of ideas within the organization and increase performance. Taking into account the personal characteristics of employees and the factors that motivate each of them by managers and monitoring the level of psychological entitlement perceptions before and after joining the organization can be an essential control mechanism to retain exceptionally talented employees.

Although studies examine the leader member exchange relationship with organizational silence and leader-member exchange and psychological contract breach, since there is no research examining these relationships holistically, a pioneering study has been conducted to guide subsequent studies. According to the results, the excellence of leader member exchange impacts how the perception of the psychological contract with entire organization is perceived. First-line managers significantly impact behavioral outcomes like employee commitment, organizational citizenship behavior, job performance, job satisfaction, and silence. However, the strength of this relationship may also have negative consequences in some cases. An employee who considers himself entitled even before joining the organization can expect different praise and rewards from the leader. Our research shows that this relationship with the leader does not affect the employee's perception much and that the employee's perception

of himself is only negatively affected when his expectations from the entire organization are unmet. In future research, personality tests regarding employees' personalities performed at the recruitment stage can also be implemented to evaluate the leader member exchange and psychological entitlement relationship. Our findings show that personality, the perception of feeling entitled, may be related to the person himself rather than the leader. Additionally, the level of psychological entitlement perception can be examined in more detail. When the perception of psychological entitlement is at a low or medium level, it can be examined how effective the interaction with the leader will be and what effect this level of personal entitlement perception has in psychological contracts where the whole organization is evaluated.

The research sample consists only of white-collar employees in Turkey and focuses on the leader member exchange, psychological contract breach, psychological entitlement, and organizational silence relationship. In future research, the number of samples can be increased, sector level comparisons can be made, different behavioral dimensions can be examined, personality structure can be added as a variable, gender factors can be taken into account, non-white-collar employees can also be included, and different demographic characteristics can be examined.

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Archaeological Tourism: Ethical Principles and Site Management in Practice

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Abstract

This study aims to examine the interaction between ethical principles and site management approaches in the context of archaeological tourism, evaluating their practical application. The concept of archaeological tourism is considered from a multidimensional perspective within the framework of site management and ethical principles. Archaeological tourism is considered a holistic field, not limited to visiting archaeological remains, but also requiring planning in line with the protection of archaeological heritage, the participation of local people, and conservation principles. As well as protecting the physical integrity of archaeological sites, site management involves responsibilities such as ensuring a high-quality visitor experience, interacting with local communities, and maintaining cultural continuity. In this context, the ethical principles of consent, respect, and mutual accommodation provide a framework for planning, implementing, and delivering archaeological tourism. Furthermore, ethical risks such as the commercialisation of heritage, singular narratives in cultural representation and the exclusion of local communities require careful consideration in site management strategies. This conceptually based approach is complemented by a historical evolution of archaeological tourism from Antiquity to the present day. Thus, archaeological tourism is presented not merely as an activity that traces the remnants of the past, but also as a field that must be restructured in light of contemporary ethical and managerial principles. This study has revealed that archaeological tourism is not just an activity that exhibits the past; it is also a multi-layered field that needs to be redefined in line with ethical responsibilities and site management principles.

Keywords: Archaeological Tourism, Archaeological Site, Archaeological Tourism Ethics, Site Management

1.INTRODUCTION

In recent years, diversification trends in global tourism have led to the rise of special interest types of tourism based on cultural heritage. Archaeological tourism is not limited to visiting areas with historical remains; it is also a unique form of tourism involving multi-layered social processes such as producing knowledge about the past, constructing identity and ensuring

cultural continuity (Sonkaya, 2021; Richards, 2019; Srivastava, 2015). However, the growth of archaeological tourism brings ethical responsibilities and structural challenges related to site management. Increasing visitor numbers threaten the physical integrity of archaeological sites, while insufficient local community involvement in decision-making processes can lead to ethical issues such as cultural erosion and the instrumentalisation of heritage (Layton & Wallace, 2005; Díaz-Andreu, 2013; Funari, Zarankin & Stovel, 2013).

An effective site management approach should consider not only physical conservation, but also participatory governance principles, the visitor experience, and the transmission of cultural values in a preserved form, all simultaneously (Walker & Carr, 2013; Pacifico & Vogel, 2012). The holistic site management model is not limited to the physical management of sites; it also requires that the ethical and structural challenges encountered in the conservation of archaeological heritage should be addressed from a holistic perspective. The study will focus on structural issues such as the commercialisation of archaeological heritage, the disregard for scientific responsibilities, and the exclusion of indigenous communities (Wolverton, Figueroa & Swentzell, 2016). The study emphasizes the necessity of developing ethics-based governance models in the processes of both preserving archaeological sites and integrating them into tourism.

The main objective of this research is to evaluate the intricate and reciprocal relationships between ethics-based approaches and site management strategies in the context of archaeological tourism. It will also critically examine how these interactions are reflected in practical applications, ultimately leading to a clearer understanding of both theoretical and practical dimensions of the field.

2.CONCEPTUAL FRAMEWORK

Technological developments, urbanisation, increased levels of education, cultural diversity and the widespread use of digital media have a significant impact on individuals' lifestyles, value judgements and holiday preferences. In particular, easier access to internet-based information and the integration of social media into everyday life have transformed tourism behaviours, bringing a desire to engage with cultural and historical values to the forefront (Cobb & Nieminen, 2023). This has created a foundation for tourists to travel not only for entertainment and relaxation, but also to gain knowledge, seek meaning and engage in cultural activities (Richards, 2001; Chhabra, 2009). Archaeological tourism, which offers unique experiences and belongs to the category of special interest tourism based on cultural heritage, is becoming increasingly important (Afkhami, 2020). The online promotion of archaeological sites, virtual museum applications, 3D modelling and digital archaeology content shared on social media increases the interest and awareness levels of potential visitors, strengthening their motivation to visit in person (Cobb & Nieminen, 2023).

The historical development of archaeological tourism dates back to the periods of Ancient Greece and Rome. During these periods, travels undertaken by affluent classes for cultural and religious purposes are considered early forms of cultural tourism. With the Renaissance, the Grand Tour travels undertaken primarily by aristocratic classes in Europe for educational purposes systematized the interest in cultural heritage (Towner, 1985). From the late 19th century onwards, archaeology became institutionalized as a scientific discipline, excavation sites began to be documented and opened to the public through museums. Archaeological tourism is a holistic field that goes beyond being merely a touristic activity; it stands out with its functions of preserving the historical memory of societies, transmitting cultural heritage to future generations, and contributing to local development (Timothy & Boyd, 2003).

However, this process also entails various ethical responsibilities. Visitor density, uncontrolled dissemination of content on social media, commercialization pressures, and imbalanced relationships with local communities can threaten the physical and cultural integrity of archaeological sites (Díaz-Andreu, 2013). Therefore, in opening archaeological sites to tourism, not only economic benefits but also scientific responsibility, cultural respect, and ethical values must be considered. An ethical approach based on principles of information, participation, and conservation enables the preservation and transmission of cultural heritage to future generations (Blasco López et al., 2018; Csoba DeHass et al., 2022).

Within this framework, to comprehensively understand the multidimensional nature of archaeological tourism, first the concepts of 'archaeological tourism,' 'archaeological site,' and 'ethics in archaeological tourism' will be explained.

2.1 Archaeological Tourism

Archaeological tourism is a multidimensional type of tourism that encompasses visits to sites of archaeological and historical significance, as well as tourism activities conducted within this context. The emergence and development of archaeological tourism in a country largely depend on the nature of the archaeological remains that the country possesses (Díaz-Andreu, 2013). Srivastava (2015) defines archaeological tourism as a type of travel focused on tracing ancient civilizations and acquiring knowledge within a historical context. Sonkaya (2021) states that this type of tourism includes sites such as museums, archaeological sites, archaeoparks, and historical buildings. On the other hand, Rao and Saksena (2020) emphasize that the development of archaeological tourism on a global scale is uneven; while some sites are under excessive visitor pressure, many others are still excluded from tourism maps. Archaeological tourism is not only a means of cultural interaction but also a powerful economic tool that supports regional development. Srivastava (2015) states that this sector generates direct economic activity through various industries such as hotels, restaurants, handicraft shops, and guiding services, and that both local governments and communities earn revenue from entrance fees and service taxes.

These economic benefits also enhance local communities' awareness of the importance of preserving archaeological sites, making it easier for them to develop a sense of ownership over these areas (Pacifico & Vogel, 2012; Rao & Saksena, 2020). An important issue in this process is the difference in approach between archaeologists and tourism professionals. Hawas (1998) and Ouf (2001) state that archaeologists lack sufficient expertise in tourism management and visitor interaction, while tourism professionals have limited knowledge about the scientific value of cultural heritage.

Eliminating this disconnection is essential for the responsible management of archaeological resources. Katherine Slick (2002) emphasises that archaeologists should not view tourism as a threat, but rather as an area of potential collaboration, and calls for interdisciplinary dialogue. Archaeological tourism is a multifaceted form of tourism that emerges at the intersection of spatial mobility and cultural heritage, and it is continuously transforming throughout history. Visiting ancient settlements and historical remains for the purpose of experiencing the tangible traces of the past, establishing a connection with cultural continuity, and seeking intellectual satisfaction are some of the various motivations that have shaped this type of tourism. In this context, the historical development of archaeological tourism has involved various spatial and social transformations.

The evolution of archaeological tourism is examined below under four main periods:

Ancient Ages: The Primitive Origins of Archaeological Consciousness: The earliest traces of archaeological tourism are seen in the life-based spatial relationships that hunter-gatherer communities established with their environment. Although these movements were not directly touristic activities, the human tendency toward sacred sites and natural formations has laid the foundations for cultural explorations and visits to symbolic places (Acar, 2020). During the Neolithic period, collective visits, especially to sacred sites stimulated cultural interaction among different communities, and thus the early forms of archaeological tourism have been observed.

The Ancient Age: Systematic Archaeological Travels: During the periods of Greek and Roman civilisation, travel was integrated with religious rituals, cultural events and aesthetic experiences. Centres such as Delphi, Olympia, Knossos and Ephesus transformed into multifunctional tourist destinations for local and foreign visitors alike (Acar, 2020: 50; Romero, 2013). In Greek society, travel began to be regarded as an intellectual and philosophical pursuit, with historians such as Herodotus pioneering early forms of travel writing (Çoraklı, 2016; Bonnard, 2004). During the Roman period, tourism became more institutionalised, with components such as tours, accommodation, health centres and souvenir trading developing during the reign of Augustus (Lomine, 2005). Examples such as the Romans carving their names into Egyptian pyramids indicate the historical continuity of tourism and the desire to leave a mark (Casson, 1994).

The Renaissance and the Grand Tour Period (Intellectual Interest in Antiquity): With the Renaissance, the intellectual revival of interest in ancient civilizations increased attention to archaeological heritage. From the 17th century onward, young members of the European aristocracy embarked on cultural journeys known as the "Grand Tour" to experience classical civilizations firsthand (Albasan, 2019). During this process, collected archaeological artifacts were initially displayed in private collections and subsequently transformed into publicly accessible museums, which served as precursors to modern museology (Albasan, 2019).

Institutionalization of Archaeological Tourism in the 19th and 20th Centuries: The Renaissance marked an intellectual revival that sparked a renewed interest in ancient civilizations, leading to increased attention to archaeological heritage. Beginning in the 17th century, young members of the European aristocracy embarked on cultural journeys known as the "Grand Tour," where they sought to experience classical civilizations firsthand (Albasan, 2019). During these tours, artifacts collected from archaeological sites were initially displayed in private collections. Eventually, these collections evolved into public museums, which served as precursors to modern museology (Albasan, 2019). In the 20th century, the concept of urban archaeology gained prominence, with urban fabrics integrated with archaeological heritage to create tourist attractions. A global turning point in this process was the 1972 UNESCO World Heritage Convention, which provided an international framework for the protection of archaeological sites and the establishment of sustainable tourism principles.

The widespread adoption of international conservation principles and the intensified interaction of archaeological sites with tourism have necessitated that these sites be addressed not only from a historical perspective but also through a managerial approach.

2.2 Archaeological Site Management

Archaeological sites are not merely the material remains of past civilizations; they are multilayered structures woven with social memory, identity, and local life (Díaz-Andreu, 2013; Pacifico & Vogel, 2012; Pinter, 2005). Therefore, site management requires a holistic framework that goes beyond physical conservation, encompassing visitor experience, ethical

responsibility, and financial sustainability. Archaeological sites are highly vulnerable due to natural factors, looting, and uncontrolled tourism activities. Physical destruction not only damages the remains but also irreversibly diminishes the potential knowledge that can be derived from these remains (Srivastava, 2015). In this regard, conservation programs should aim to simultaneously protect both the tangible heritage and the scientific data.

A significant portion of the damage to heritage sites stems from negligence, ignorance, and commercial greed (Crosby, 2002). Therefore, educating the local community about the value of archaeological materials should be an integral part of management processes. Strengthening local participation not only keeps social memory alive but also reduces conservation costs. Increasing tourist demand is transforming the presentation methods of archaeological sites. Traditionally expert-focused sites now have to accommodate the expectations of broader audiences (Walker & Carr, 2013). Within this framework, it is recommended that sites be positioned on a continuum of "education and entertainment" (Hughes et al., 2013).

Visitor loyalty is fed by a multifaceted perception system consisting of satisfaction, trust, emotional attachment, and positive surprises (Chen & Phou, 2013; Keränen & Jalkala, 2014; Prayag et al.. 2013). The transmission of knowledge that strengthens experiential values, relationship investment, and quality service affects repeat visits positively (Blasco López et al.. 2020; Zeithaml, 1988).

The "emotional uniqueness" of archaeological sites (Castellanos-Verdugo, Oviedo-García & Martín-Ruiz, 2011) meets visitors' need to form connections as much as their cognitive learning (Martín-Ruíz et al.2010; Sánchez et al., 2006). This need can be supported through storytelling and multi-sensory presentation techniques. The static nature of archaeological narratives offers visitors only “old and beautiful” objects in the absence of interpretation; however, people desire to hear stories, be entertained, and contribute (Lazrus, 2006; Slick, 2002).

Educational attractions risk being perceived as “static” while preserving their authenticity (Chhabra, Healy & Sills, 2003; Duke, 2007). In contrast, simulation-based entertaining approaches provide visitors with stories and foster personal connections (Beeho & Prentice, 1997). Management strategies should balance between these two poles (Beeho & Prentice, 1997). Intense interest has given rise to a new audience that is distant from archaeology but highly eager for experience. Offering multiple types of sites to these tourists, who approach authenticity with different sensitivities, reduces potential dissatisfaction (Cohen, 1988; Mazzola, 2015). Diversified experiences should be designed in a way that does not conflict with heritage preservation.

Site management involves ethical responsibilities beyond strategic and operational processes. Actions taken without sensitivity to local identity and memory lead to cultural erosion (Díaz-Andreu, 2013). The economic benefits of entertainment-focused presentations must be balanced with conservation obligations (Slick, 2002). Not compromising the meaning of heritage while meeting visitor needs is a fundamental principle of ethical management (Beeho & Prentice, 1997). Sites that cannot analyze the identity of their visitor base and do not consider their experiential needs fail to sustain their existence in the competitive heritage tourism environment (Beeho & Prentice, 1997). Site management is more dependent than ever on the support of broad audiences and public funding (Malcolm-Davies, 2004). Limited public interest in archaeology jeopardizes financial sustainability (Holtorf, 2007; Young, 2006). Therefore, communication and information programs should be conducted within an ethical framework that strengthens social support.

From a site management perspective, physical conservation requires a multidimensional strategy that includes experience design, adherence to ethical principles, alignment with visitor profiles, and public engagement. Archaeological sites are positioned not only as contributors to the preservation of cultural heritage but also as centers that attract stable visitor interest over time.

2.3 Archaeology and Ethics

Over the past half-century, archaeological heritage has become the focus not only of academic circles but also of the public, the tourism sector, and government policies. This expansion has necessitated the emergence of archaeological ethics, a new interdisciplinary field. The concept of ethics derives from the Ancient Greek word *ethos* ("custom") and was first systematically examined by Aristotle; today, it is defined as a normative field of thought aiming to justify the distinction between "good" and "bad" (Singer, 2011).

Within the scope of this study, archaeological ethics is addressed as a normative and principled framework that considers the rights of local communities, the integrity of cultural values, and scientific responsibilities in the processes of preservation, management, and presentation of archaeological heritage. Ethical debates in archaeology emerged particularly with increasing concerns over the inadequacies in the protection of site areas, laying the groundwork for the emergence of the concept of cultural heritage management (Díaz-Andreu, 2013). However, the concepts of ethics and archaeological tourism have, with some exceptions, remained two distinct fields rarely brought together in the academic world (Meskell, 2005).

Archaeological ethics focuses on three fundamental principles based on the cultural heritage claims of indigenous and local communities: consent, respect, and reciprocity (Wolverton, Figueroa & Swentzell, 2016). The principle of consent emphasizes that no archaeological or tourism activity should commence without informed approval. Respect requires that the cultural values, beliefs, and rituals of indigenous peoples are not harmed. The principle of reciprocity necessitates collaboration based on equal say among archaeologists, tourism operators, and local communities.

This tripartite framework is also reflected in the ethical codes of organizations such as the Register of Professional Archaeologists (RPA), the Society for American Archaeology (SAA), and the World Archaeological Congress (WAC).

However, the commercialization of the past is one of the most criticized ethical aspects of archaeological tourism. Tour operators transforming cultural heritage into a "packaged" product superficializes the symbolic meaning of heritage and weakens historical ties with local communities (Layton & Wallace, 2005; Walker & Carr, 2013). Such approaches also lead to the disrespectful use of sites considered sacred and physical damage to archaeological remains due to unconscious tourist behaviors (Walker & Carr, 2013).

Government policies deepen ethical dilemmas by instrumentalizing archaeological heritage for ideological purposes. The use of archaeological heritage in national identity construction often results in the exclusion of indigenous and local communities; universal value discourses lead to the marginalization of local demands (Díaz-Andreu, 2013). Such instrumentalizations not only superficialize the meaning of heritage but also weaken the sense of belonging among communities. Funari, Zarankin, and Stovel (2013) state that archaeological tourism carries both opportunities and threats, compelling archaeologists to confront ethical responsibilities.

The exclusion of indigenous communities is one of the most common ethical violations in archaeological tourism. The historical memory of these communities reveals that archaeological sites possess not only scientific but also social and cultural contexts. Therefore,

an ethical approach should encompass not only physical conservation but also ensuring local participation, supporting cultural education, and preserving collective memory (Pacifico & Vogel, 2012).

In order to address ethical issues, archaeologists need to develop not only technical expertise but also ethical sensitivity. In this context, professional training programs should place greater emphasis on ethics and cultural heritage management. More equitable and participatory relationships should be established with local communities, ensuring their active involvement in the management and presentation of archaeological sites. This approach will contribute significantly not only to the sustainable preservation of heritage but also to the establishment of social justice (Díaz-Andreu, 2013).

3.CONCLUSION

Archaeological tourism is a multidimensional field that involves not only the physical experience of historical heritage through visits but also the responsibility of preserving this heritage, sharing it with society in accordance with ethical principles, and transferring it to future generations. In this context, the continuous management of archaeological sites is of critical importance for the long-term success of archaeological tourism. Effective site management requires not only physical conservation measures but also enhancing the quality of visitor experience, strengthening ethically based cooperation with local communities, and adopting a holistic approach that reflects the universal values of cultural heritage.

The integration of digital technologies into archaeological heritage management expands both physical and virtual access to sites while supporting ethical and preservation-oriented approaches. Innovative methods such as virtual reality, augmented reality, and storytelling techniques enrich archaeological narratives, providing meaningful experiences for both physical and digital visitors, while also reducing physical pressure on remains and contributing to conservation efforts. However, ethical principles such as the accuracy of cultural representation and the consent of local communities should form the foundation of management processes in the use of these technologies.

The growth of archaeological tourism brings with it ethical and managerial challenges. The commercialization of heritage, the exclusion of local communities from decision-making processes, and one-sided narratives in cultural representation pose serious threats both ethically and in terms of sustainability. Therefore, policies and site management practices related to archaeological tourism should be grounded in an ethical framework based on the principles of consent, respect, inclusivity, and mutual benefit. This framework should strengthen the ties of local people to cultural heritage while ensuring the equitable distribution of the socio-economic benefits of tourism.

In conclusion, the sustainability of archaeological tourism depends on site management strategies developed through an interdisciplinary approach, the ethical use of technological innovations, and governance models grounded in a strong ethical foundation. A collaborative governance model established among archaeologists, site managers, local communities, and tourism stakeholders will ensure the preservation of archaeological heritage and its continuation as a public value. Archaeological tourism should be defined not merely as an activity tracing the remnants of the past but as a dynamic and responsibility-laden field of study that must be reshaped in light of ethical principles and effective site management.

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