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Artificial Intelligence in Public Relations and Strategic Communication: Organizational, Technological, and Environmental Determinants of Adoption in Agency Contexts

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Abstract

The recent rise of artificial intelligence (AI) has sparked interest among scholars in various fields, particularly public relations (PR) and strategic communication (SC). As the digital landscape evolves and competition intensifies, integrating AI technology into PR and SC practices becomes increasingly essential. This study aims to identify factors influencing AI adoption in PR and SC agencies using the technology–organization–environment (TOE) framework. Structural equation modeling was employed to analyze the relationships between influencing factors—client pressure, competitive pressure, compatibility, complexity, relative advantage, top management support, and organizational readiness—and the intention to adopt AI. A survey of 277 PR and SC agencies across the Arab world was conducted for data collection. The analysis indicated that client pressure, competitive pressure, relative advantage, and organizational readiness positively impact AI adoption, while complexity negatively affects it. Additionally, relative advantage mediates the relationship between competitive pressure and AI adoption, and organizational readiness mediates between compatibility and AI adoption, as well as between top management support and AI adoption. The study discusses the theoretical contributions and practical implications of these findings.

Plain Language Summary

How AI is Transforming Public Relations and Strategic Communication in the Arab World: Key Factors Revealed

Artificial intelligence (AI) is changing how businesses communicate, but little is known about how public relations (PR) and strategic communication (SC) agencies adopt these tools. This study surveyed 277 agencies in the Arab world to identify what drives or hinders AI use. Results show that agencies adopt AI when clients demand modern solutions, competitors use AI, or when AI offers clear benefits over old methods (like speed or cost savings). Agencies with resources, skilled staff, and leadership support also adopt AI more readily. However, if AI tools are too complex or challenging to integrate, adoption slows. Interestingly, the pressure to keep up with competitors often pushes agencies to adopt AI only if they see clear advantages. Similarly, support from leaders and user-friendly tools matter more when agencies are prepared to use them. This study helps PR and SC professionals understand how to navigate AI adoption. It highlights the need to balance client needs, stay competitive, simplify tools, and invest in training. For the Arab region, these insights provide a roadmap to harness AI's potential in communication strategies.

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artificial intelligence, public relations, strategic communication, agency, TOE framework

Introduction

Artificial intelligence (AI) is a powerful technology that offers numerous opportunities to access a vast amount of information, process it, analyze it, and provide a variety of solutions (Duan et al., 2019; Marr, 2019). The rising impact of AI on organizational communication and recent technological advances indicate that these tools have evolved from mere communication channels into intelligent entities transforming communication dynamics (Valentini & Edwards, 2019). AI changed the way communication professionals work and challenge long-standing industry practices (Pavlik, 2023). However, despite the enormous potential of AI, it's surprising that many organizations still struggle to embrace this transformative technology (Neumann et al., 2024). Bourne (2019) indicated that AI ignorance may reduce diversity in public relations roles. Thus, this research aims at exploring the factors affecting the adoption of AI by public relations (PR) and strategic communication (SC) agencies.

AI definition

The term AI encompasses a range of socio-technological approaches and has been defined in various ways. Today, many people use the term, much like it was in the 1950s, to refer to a machine's ability to perform tasks and produce results that are indistinguishable from those achieved by a human (Buhmann & White, 2022; Corea, 2019). A study by Gil de Zúñiga et al. (2024) aimed to define AI in the context of communication research, describing it as "the tangible real-world capability of non-human machines or artificial entities to perform, task solve, communicate, interact, and act logically as it occurs with biological humans" (Gil de Zúñiga et al., 2024: 320). This study regards AI as a tool that assists PR and SC agencies in fulfilling their tasks, positioning it as a supportive resource for practitioners rather than a substitute for humans. Our definition aligns with the view of Yue et al. (2024) that as AI transforms communication, PR entities and professionals must adapt to leverage its potential while prioritizing human connection and ethical considerations.

Literature Review

Artificial Intelligence in Public Relations and Strategic Communication

The adoption of AI has attracted significant scholarly attention across various fields. While extensive research has investigated AI integration in sectors such as sustainable businesses, cloud computing, education, and healthcare, its application in PR and SC is still in the early stages but is evolving rapidly. In the communication field, the intriguing area of AI in SC and PR research has been receiving increasing attention (Gil de Zúñiga et al., 2024), though still not enough as Logan and Waymer (2024) argue that although PR AI literature is rapidly advancing, it remains in the early stages of development. This idea was reinforced earlier by Galloway and Swiatek (2018) who argued that AI in PR have received little scholarly attention.

In the context of communication training, Lopezosa et al. (2023) explored the use of generative AI in training journalists and discussed challenges, uses, and proposed training methods. Similarly, Mateus et al. (2024) examined how communication educators in Mexico, Peru, and Spain are adapting to the arrival of Generative AI. Neill et al. (2024) compared the expectations and actual performance of essential competencies in PR, finding that educators overestimated generative AI use in the workplace, as practitioners exhibited a slower adoption rate of AI. However, Duckett and Westrick (2025) stressed the need to equip future professionals with the knowledge and skills to navigate AI technologies effectively and ethically. According to Galloway and Swiatek (2018), this does not mean that PR practitioners need to become expert technologists; instead, they should understand AI's current and potential applications to provide informed guidance. However, Panda et al. (2019) argued that it is too early to determine if AI will disrupt the PR industry strategically. A survey conducted by Cusnir and Nicola (2024) within the Romanian PR community not only did 67.3% of respondents not recognize AI as a pressing threat to PR jobs, but 80.5% believed AI embodies an opportunity for the industry.

As the literature review shows, there has been no research specifically addressing these factors in the fields of PR and SC. Despite this gap, emerging investigations into AI in communication and PR research seem promising. According to Kelm and Johann (2024), understanding the factors that influence technology adoption is essential for PR and SC agencies to effectively implement AI tools. This necessitates addressing crucial questions about what factors affect the adoption of AI by PR and SC agencies. Accordingly, this study addresses the central research question: *What factors influence the adoption of AI by PR and SC agencies?*:

The Employment of AI in PR and SC

PR and SC agencies, along with their practitioners, actively harness the power of artificial intelligence (AI) to enhance their operations. They can utilize AI to improve the experiences of their customers and clients (Guarneri, 2023). AI is essential for conducting thorough desk research, efficiently collecting and analyzing data, and improving decision-making processes. It plays a crucial role in data visualization, managing media relations, and listening to social conversations. Additionally, AI enables seamless speech-to-text conversion, content creation, and effective monitoring and prediction of public opinion trends (Buhmann & White, 2022; Galloway & Swiatek, 2018; Logan & Waymer, 2024; Volarić et al., 2024). AI can improve communication with key industry professionals by enabling PR agencies to tailor messages more effectively for specific audiences, thus enhancing the campaigns' outreach efforts (Guarneri, 2023). The use of AI for mass personalization and customization can enhance the effectiveness of PR activities and PR professionals can save time on routine tasks with AI, such as creating media lists, scheduling meetings, and sending follow-up emails (Panda et al., 2019). By leveraging these capabilities, PR and SC professionals gain deep insights into audience behavior and media trends, allowing them to implement highly targeted and impactful communication strategies.

In the context of crisis management, Panda et al. (2019) emphasize that AI can effectively track reactions, sentiments, and outcomes. They argue that by monitoring and engaging in conversations, brands can address the concerns and issues of dissatisfied stakeholders, thereby helping to prevent potential negative publicity or backlash. In today's digital landscape, negative messages can spread rapidly, leading to a full-blown crisis. AI-powered tools for social listening provide PR and SC professionals with timely alerts, enabling them to address problems swiftly. Furthermore, these AI systems can respond with appropriate messages to help manage negative word of mouth and prevent a crisis from escalating (Panda et al., 2019).

The Technology–Organization–Environment (TOE) Framework

The Technology Organization and Environment (TOE) framework, developed by Louis G. Tornatzky and Mitchell Fleischer in 1990, comprises three main components: technological context, organizational context, and environmental context. Environmental and technological factors are external variables that impact an organization's ability to adopt technology, while organizational factors are internal variables that play a crucial role in this process (Nguyen et al., 2022).

Regarding the technological context, previous studies have investigated several variables, including relative advantage (Al-khatib, 2023; Alsheibani et al., 2020; Ghobakhloo et al., 2011; Neumann et al., 2024; Simina & Dutescu, 2024), compatibility (Al-khatib, 2023; Alsheibani et al., 2020; Neumann et al., 2024; Simina & Dutescu, 2024), complexity (Al-khatib, 2023; Ghobakhloo et al., 2011; Lian et al., 2014; Neumann et al., 2024; Simina & Dutescu, 2024), and technology preparedness. In the context of organizations, the most common variables that significantly impact innovation adoption are senior management support (Al-khatib, 2023; Iranmanesh et al., 2023; Lian et al., 2014; Lutfi et al., 2023; Merhi & Harfouche, 2024; Neumann et al., 2024; Shang et al., 2023; Tjebane et al., 2022), firm size (Cusnir & Nicola, 2024; Gutierrez et al., 2015; Neumann et al., 2024; Simina & Dutescu, 2024), organizational readiness (Gutierrez et al., 2015; Shang et al., 2023; Simina & Dutescu, 2024). Regarding environmental factors, it is suggested that organizations consider competitive pressure (Al-khatib, 2023; Ghobakhloo et al., 2011; Jia et al., 2017; Kajla et al., 2024; Neumann et al., 2024; Salah & Ayyash, 2024), client requirements (Kajla et al., 2024; Wu & Lee, 2005; Wu et al., 2003), and government regulations (Neumann et al., 2024; Prasad Agrawal, 2024).

Although a firm's size may influence its adoption of AI, we excluded this factor from our analysis because it was deemed confidential in the pilot study involving 30 firms before the survey distribution. However, many experts believe that larger organizations are better equipped to embrace AI, as they possess greater financial, human, and technological resources. Larger companies can manage initial costs and potential risks more effectively, which is why they are often more innovative in terms of technological advancement (Pan & Jang, 2008; Simina & Dutescu, 2024).

Hypothesis Development

This study aims to address the lack of understanding surrounding the current state of AI adoption in PR and SC using the TOE framework. It explores the primary drivers or enablers that influence the adoption of AI in these agencies. The study proposes a conceptual framework (refer to Figure 1) that includes the variables being investigated.

Technological Factors and AI Adoption in PR and SC Agencies

Relative Advantage and AI Adoption

Relative advantage refers to how an innovation is perceived as better compared to previous installations

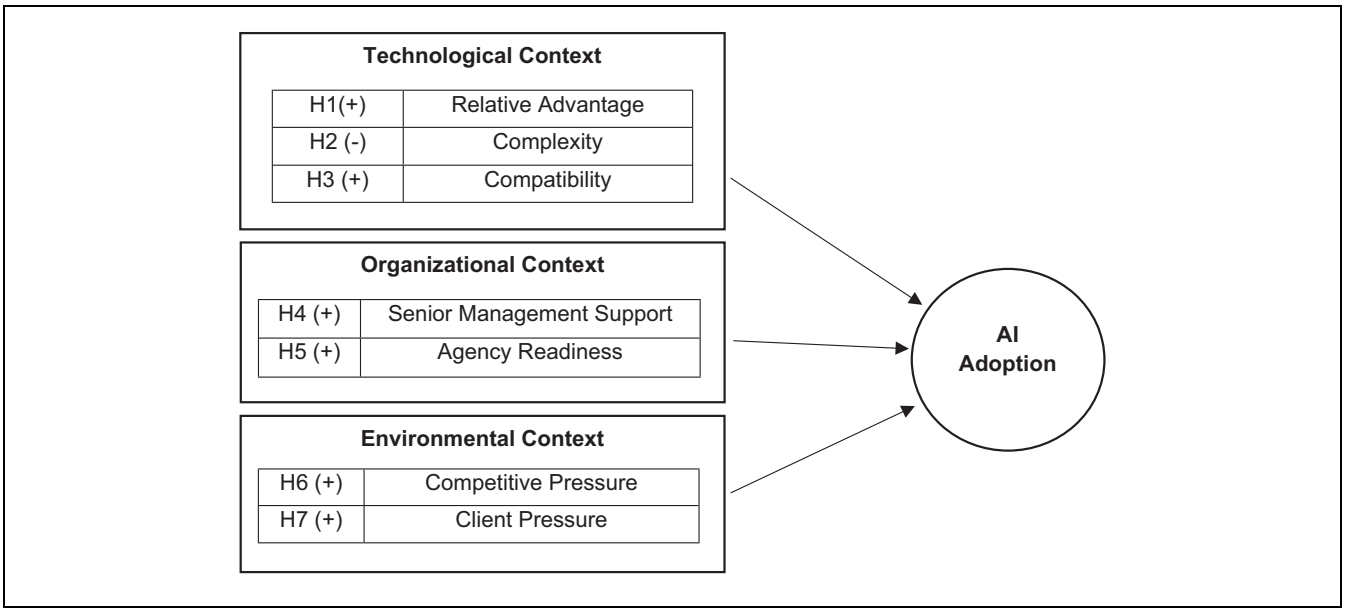

Figure 1. The study conceptual framework model based on TOE variables.

(Rogers et al., 2014). In this study, we define relative advantage as the extent to which AI tools are perceived by PR and SC agencies as superior to the technology currently used by their staff, providing greater benefits for the agencies. Prior research shows that relative advantage significantly affects adoption decisions (Badghish & Soomro, 2024; Felemban et al., 2024) Accordingly, we propose:

H1. Relative advantage directly influences AI adoption in PR and SC agencies.

Complexity and AI Adoption

Complexity is "the degree to which an innovation is perceived as relatively difficult to understand and use" (Rogers & Shoemaker, 1971: 154). According to Rogers et al. (2014), the adoption of new technology is less likely to occur if it is perceived as more difficult to use. Berman et al. (2012) suggest that for new technologies to be widely adopted, they should be user-friendly and easily manageable. Complexity involves two fundamental elements: the challenges of customization and the associated costs (Tsai et al., 2010). Hence, this study suggests that the more complex AI seems to PR and SC agencies, the less they adopt it.

H2. Complexity directly affects the adoption of AI in PR and SC agencies.

Compatibility and AI Adoption

Compatibility refers to the smooth integration of applications that enhances business activities through technology. It indicates how a specific technological solution aligns with the needs of a given context (Simina & Dutescu, 2024). Incompatibility can hinder the adoption of new technologies; Alsheibani et al. (2020) noted that a high level of technology compatibility facilitates AI adoption. Numerous studies have shown that compatibility significantly influences AI adoption (Alsheibani et al., 2020; Chatterjee et al., 2021; Prasad Agrawal, 2024; Simina & Dutescu, 2024). Therefore, this study posits that the less compatible AI appears to PR and SC agencies, the less likely they are to adopt it.

H3. Compatibility directly influences the adoption of AI in PR and SC agencies.

Organizational Factors and AI Adoption in PR and SC Agencies

Top Management Support and AI Adoption

Top management support involves senior leaders initiating AI initiatives from the top while backing grassroots efforts. Given the significant organizational demands of implementation, this support is crucial for successful AI adoption. Experts agree that full commitment to AI adoption hinges on top management approval. Key

indicators of robust support include integrating AI into the company's strategy and promoting AI expertise and awareness (Tjebane et al., 2022). A number of studies have shown that support from senior management is essential for the successful adoption of new technologies, including AI tools (Iranmanesh et al., 2023; Lutfi et al., 2023; Merhi & Harfouche, 2024; Shang et al., 2023). Accordingly, this study proposed the following hypothesis:

H4. Support from top management can greatly enhance the adoption of AI in PR and SC agencies.

Organizational Readiness and AI Adoption

Organizational readiness refers to the ability of an organization to effectively adopt and implement a technology (Chatterjee et al., 2021). Many scholars assert that the availability of organizational capabilities and capacities is critical to technology adoption (Ahmed et al., 2023; Mady et al., 2022). Organizations carefully assess the costs of innovation before adoption. AI technology implementation requires significant, irreversible investments and poses inherent risks that businesses must consider. Companies with lower profit margins face steeper implementation costs compared to traditional systems, which deters them from taking on the risks associated with AI (Prasad Agrawal, 2024). This study investigates how these adoption costs influence the willingness of PR and SC agencies to adopt AI technologies.

Dubravac and Bevanda (2015) revealed that companies consider organizational risks as most important when it comes to innovation adoption, particularly insufficient training and financial resources. Shang et al. (2023) found that one of the top barriers to AI adoption is the lack of skilled employees trained in AI. This study examined the willingness of PR and SC agencies to invest financial resources in AI technologies and employee training as crucial factors influencing AI adoption. Thus, we propose:

H5. Organizational readiness directly influences the adoption of AI in PR and SC agencies.

Environmental Factors and AI Adoption in PR and SC Agencies

Competitive Pressure and AI Adoption

Competitive pressure is explained in terms of its effect on a business's incentives to undertake product and process innovations (Boone, 2000). The concept of competitive pressure arises from the belief that competitors can gain advantages by adopting new technologies (Jia et al., 2017). The term refers to how an organization responds to rivals' influence and motivates it to adopt new technologies (Al-Jabri & Alabdulhadi, 2016). We operationally define competitive pressure as the situation in which PR and SC agencies experience pressure from competitors who adopt AI tools. This competitive dynamic encourages agencies to invest in AI, which not only fuels creativity but also enhances efficiency to position the agency for greater success in the marketplace. According to Zhong and Moon (2023), organizations facing competitive pressure are more likely to rapidly adopt new technologies. Simina and Dutescu (2024) report that competitors using AI can provide higher-quality services and reach more clients. This study explores whether agencies feel pressured to adopt AI technologies to remain competitive in public relations and strategic communication. Jia et al. (2017) found that competitive pressure, significantly influence enterprises' intentions to renew their technologies. Therefore, we have formulated the sixth hypothesis:

H6. Competitive pressure directly influences the adoption of AI in PR and SC agencies.

Client Pressure and AI Adoption

This study examines client pressure, which reflects the influence clients have on PR and SC agencies to achieve desired outcomes, often leading to the use of AI. Chatterjee et al. (2021) suggest that clients are more inclined to engage with companies utilizing AI solutions when they recognize a commitment to high-quality services. Simina and Dutescu (2024) highlight that proactive companies open to change can enhance client benefits, thereby increasing brand trust. This dynamic places greater pressure on agencies to satisfy their clients. Consequently, we explored whether key clients expect their PR and SC agencies to adopt advanced technologies, such as AI, for business growth and whether the failure to do so could jeopardize client retention and agency relationships.

H7. Client pressure directly influences the adoption of AI in PR and SC agencies.

Method

Research Design

This study used a quantitative research design with a cross-sectional survey approach to explore the factors influencing the adoption of AI in PR and SC agencies. We employed a quantitative approach to facilitate the statistical analysis of relationships between variables, which allows for the identification of significant predictors of AI adoption among a larger sample. This design

is effective for examining perceptions and intentions within a specific population (Rudra et al., 2025).

Population and Sampling Strategy

The target population for this study consisted of PR and SC agencies operating throughout the Arab world. A comprehensive list of these agencies was created using industry directories, professional associations, and online databases. We employed a stratified random sampling strategy to ensure representation from various countries within the Arab region and different sizes of agencies. The final sample size included 277 agencies, which was determined through power analysis for structural equation modeling (SEM). Our approach ensured there was sufficient statistical power to identify hypothesized relationships with a moderate effect size and a desired level of confidence. Accordingly, this sample size aligns with recommendations for PLS-SEM studies, aiming for robust and generalizable results. The sample size of 277 exceeds the minimum requirements for PLS-SEM, as recommended by Hair Jr et al. (2022) using the "10-times rule" and statistical power analysis (Cohen, 1992). It also significantly surpasses the thresholds set by recent simulation-based methodologies (Kock & Hadaya, 2018), thereby guaranteeing sufficient power to identify small-to-moderate effects.

Data Collection Procedures

We collected data using a structured online questionnaire directed at the agency's president of the client within selected PR and SC agencies. We selected this individual as they manage the critical client-agency relationship and collaborate closely with the president of operations to create suitable scopes of work. Additionally, they oversee account team members' well-being, mediate conflicts, and act as the primary contact for clients, also participating in event planning. The data collection process occurred over 8-week from October 3 to November 26, 2024. We invited participants to participate in the survey via WhatsApp and email, and we sent periodic reminders to enhance response rates. We assured participants of their anonymity and confidentiality to encourage honest responses.

Participants were informed about the study's purpose, the voluntary nature of their participation, and their right to withdraw at any time. No identifying or sensitive personal data was collected. By completing the questionnaire, participants indicated their informed consent. The study was designed to minimize any potential risks, and the anticipated benefits of advancing knowledge in public relations and strategic communication outweighed any risks to the participants.

Measures

The questionnaire for this study was developed based on previous research utilizing the TOE theoretical framework in various fields (Al-khatib, 2023; Bag et al., 2023; Ghobakhloo et al., 2011; Lian et al., 2014; Maroufkhani et al., 2023; Sharma et al., 2022). Certain items were adjusted to fit the AI context in PR and SC. The final questionnaire consisted of 50 items addressing all relevant constructs. However, following exploratory factor analysis, some items were removed because their loadings were below .7. Consequently, 35 items were analyzed in this study, as shown in Table 1. The participants were asked to evaluate the items using a five-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Data Analysis

We analyzed the collected data using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0. We chose PLS-SEM because it is well-suited for exploratory research and can effectively handle complex models with multiple mediating relationships. Additionally, it has less stringent assumptions about data distribution than covariance-based SEM. The analysis was conducted in two stages: first, we assessed the measurement model, followed by an evaluation of the structural model.

Measurement Model Assessment

The reliability and validity of the constructs were evaluated. Internal consistency reliability was assessed using Cronbach's Alpha and Composite Reliability (CR). To evaluate convergent validity, we examined factor loadings and Average Variance Extracted (AVE). Discriminant validity was established following the Fornell-Larcker criterion and the Heterotrait-Monotrait Ratio (HTMT). Items with loadings below 0.7 were removed to enhance the reliability and validity of the constructs, per established guidelines.

Structural Model Assessment

The structural model was assessed by examining the path coefficients (β), their significance (p-values), and the R-squared values for endogenous constructs. Bootstrapping (5,000 subsamples) was performed to determine the significance of the path coefficients. Mediation effects were analyzed using the specific indirect effects approach, also with bootstrapping, to confirm the mediating roles of relative advantage and organizational readiness.

Table 1. Measurement Scale and Factor Loadings.

Construct	Item	Code	Factor loading
AI Adoption (AIA)	Our agency plans to implement AI technologies in its activities such as campaign management.	AIA1	0.8
	Our agency intends to adopt AI technologies in the future.	AIA2	0.9
	Our agency strongly recommends other agencies to adopt AI technologies.	AIA3	0.9
	Our agency has a positive attitude towards adopting AI technologies.	AIA4	0.9
	Our agency plans to incorporate AI technologies into modern marketing strategies, including the integration of celebrities into visual advertisements.	AIA5	0.8
Client Pressure (CLP)	Our key clients expect our agency to leverage the latest technologies, including AI, to drive business growth.	CLP1	0.8
	Key clients motivate our agency management to strategically consider adopting AI technologies.	CLP3	0.8
	Our key clients possess significant knowledge and experience with AI technologies and their benefits.	CLP4	0.8
	Our agency is under pressure from clients to deliver quickly, prompting us to adopt AI technologies.	CLP5	0.7
Compatibility (COMPA)	AI technologies align with our agency's work.	COMPA1	0.9
	Our agency's infrastructure supports modern AI technologies.	COMPA2	0.8
	AI technologies align with our agency's goals and culture.	COMPA3	0.8
	AI technologies integrate seamlessly with our existing systems.	COMPA4	0.8
Complexity (COMPL)	Implementing AI technologies at our agency will be challenging for employees due to their lack of prior knowledge.	COMPL2	0.9
	Implementing AI technologies in the agency's work demands significant mental effort.	COMPL3	0.9
	The agency's management and employees lack awareness of modern AI technologies and their practical benefits.	COMPL4	0.9
	The skills required to use AI technologies are beyond the capabilities of our employees.	COMPL5	0.9
Competitive Pressure (CP)	The integration of AI technologies by our agency will significantly influence the competitive landscape in public relations and strategic communication.	CP1	0.7
	We believe that leveraging AI technologies is essential to remain competitive in the public relations and communication market.	CP4	0.9
	Our agency is motivated to adopt AI technologies to stay competitive in the market.	CP5	0.9
Organizational Readiness (OR)	Our agency invests financial resources to leverage AI technologies.	OR1	0.8
	Our agency trains employees in the latest AI technology methods.	OR2	0.8
	Our agency continuously updates its infrastructure to leverage AI technologies.	OR3	0.9
	Our agency fosters an innovative culture that embraces new technology and creativity.	OR4	0.7
	Our agency continually evolves its organizational structure to align with advancements in AI technology.	OR5	0.7
Relative advantage (RA)	AI technologies will allow us to run more efficient and effective campaigns.	RA11	0.8
	AI will help PR professionals save time on routine tasks like creating contact lists, scheduling meetings, and sending follow-up emails.	RA12	0.8
	Implementing AI technologies in our agency will enhance our competitive edge and boost operational efficiency and productivity.	RA13	0.7
	AI technologies will empower our employees to perform thorough desk research for planning and managing campaigns.	RA6	0.7
	AI technologies will enable our employees to effectively gather and analyze audience data.	RA7	0.8
	AI technologies will empower our employees to manage client media relations more effectively than current tools.	RA9	0.8
Top Management Support (TMS)	Our agency leaders support employee-driven AI initiatives.	TMS1	0.8
	Our agency's senior management is prioritizing the inclusion of AI technologies.	TMS2	0.9
	Our management is actively securing financial resources to implement AI technologies in our agency's operations.	TMS3	0.8
	Senior management at our agency provides rewards to employees skilled in AI technology.	TMS5	0.8

Table 2. Reliability and Convergent Validity.

Construct	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	AVE
AIA	0.89	0.9	0.92	0.7
CLP	0.8	0.81	0.87	0.63
COMPA	0.83	0.83	0.89	0.66
COMPL	0.91	0.92	0.94	0.79
CP	0.73	0.76	0.85	0.65
OR	0.85	0.86	0.9	0.63
RA	0.85	0.86	0.89	0.58
TMS	0.85	0.85	0.9	0.69

Results

This study investigated adoption as the dependent variable. Measurement items for both independent and dependent variables are shown in Table 1.

Structural equation modeling consists of two main categories: measurement and structural model assessment. Evaluating the measurement model involves assessing both validity and construct reliability. Construct reliability is determined using Cronbach's alpha and Composite Reliability (CR). The construct reliability and convergent validity for the participant sample are presented in Table 2.

The Cronbach's alpha values and the CR for each construct exceeded the recommended cutoff point of 0.7 (Hair Jr et al., 2011). Additionally, the Average Variance Extracted (AVE) for the constructs was greater than 0.5, demonstrating convergent validity (Henseler et al., 2015). The overall Goodness of Fit (GoF) for the hypothesized model was 0.64, which satisfies the global criterion of 0.3 established by Henseler et al. (2015).

The questionnaire was validated through a pre-test with three academic PR experts, one measurement and evaluation expert, and a cloud computing expert familiar with the TOE framework. According to Fornell and Larcker (1981), the square root of the average variance extracted (AVE) for a construct must be greater than its correlations with any other construct. Henseler et al. (2015) utilized the heterotrait-monotrait (HTMT) ratio of correlations technique. For conceptually similar constructs, it is recommended to use an HTMT criterion of 0.90. For more distinct configurations, Henseler et al. (2015) suggest a lower threshold of 0.85. Since none of the HTMT values exceed the 0.85 cutoff, and all diagonal elements are higher than the correlations below them, the discriminant validity presented in Table 3 is established.

Path Analysis of the Research Model

As part of the hypothesis testing procedure in Smart PLS 4, the directionality and significance of route coefficients—which show the direction and strength of interactions between components—are assessed. To ascertain the standard errors and significance levels of path coefficients, SmartPLS 4 uses bootstrapping procedures. The process of bootstrapping generates thousands of resamples from the original data; in the case of our study, robust standard errors and confidence intervals were constructed using 5000 iterations. Since the path coefficients' p-values are below the specified cut-off point of 0.05, it is improbable that the observed relationships are the product of chance. With its emphasis on immediate impacts, this is regarded as significant. The supporting evidence for each direct effect is displayed in Figure 2 and Table 4. According to Cohen (1988), endogenous latent variables have R^2 values of 0.02 (weak), 0.13 (moderate), and 0.26 (substantial). All of the R^2 values in our study are regarded to be substantial because they are more than 0.26.

With positive values of 0.25, 26, 0.16, and 0.21, respectively, CP, RA, OR, and CLP accounted for 65% of the variance in AI adoption. With a negative coefficient of −0.28, COMPL also contributed to the variance explained in AI adoption. COMPA and TMS, together, explained 62% of the variance in OR with positive

Table 3. Discriminant Validity Using the Criterion by Fornell & Larcker and Heterotrait- Monotrait Method (HTMT).

Construct	AIA	CIP	COMPA	COMPL	CP	OR	RA	TMS
AIA	**0.84**	0.59	0.58	−0.36	0.68	0.54	0.65	0.47
CLP	0.69	**0.79**	0.44	0.02	0.56	0.56	0.59	0.57
COMPA	0.67	0.53	**0.81**	−0.24	0.56	0.54	0.56	0.5
COMPL	0.39	0.11	0.27	**0.89**	−0.23	−0.01	−0.1	0.07
CP	0.83	0.75	0.74	0.26	**0.81**	0.51	0.63	0.47
OR	0.6	0.67	0.63	0.2	0.65	**0.79**	0.49	0.77
RA	0.74	0.71	0.67	0.12	0.8	0.57	**0.76**	0.52
TMS	0.53	0.69	0.59	0.14	0.62	0.69	0.62	**0.83**

Note. Bold diagonal elements represent the square roots of the average variance extracted (AVE). The elements above the diagonal indicate the correlations between the constructs, while those below the diagonal represent the HTMT values.

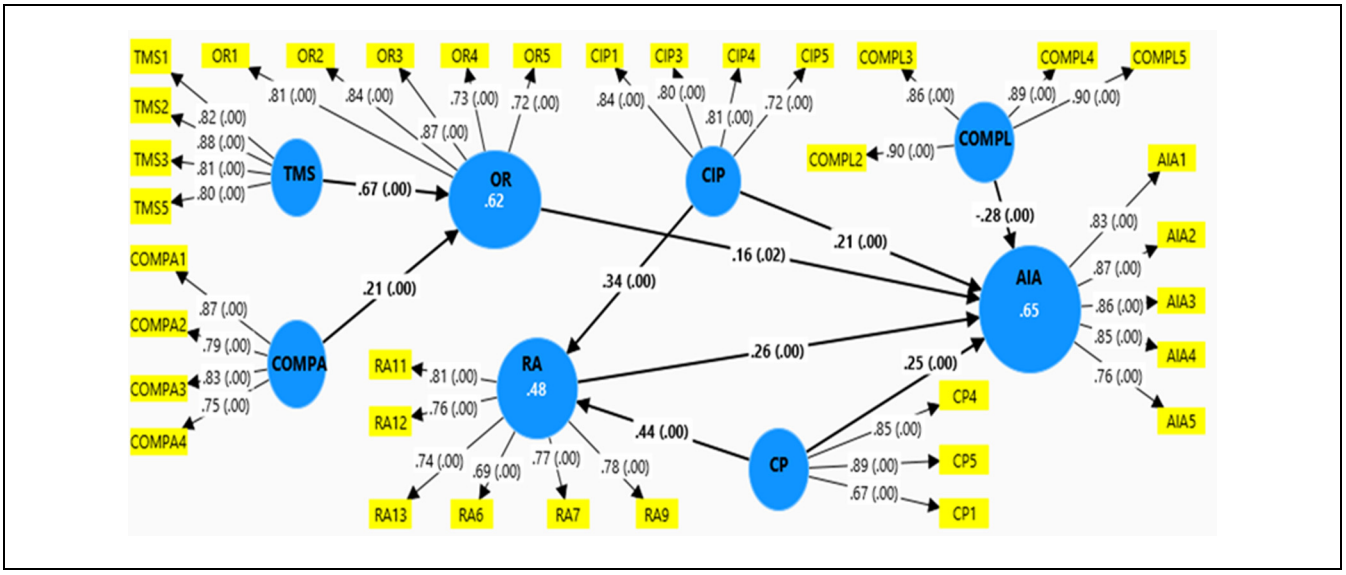

Figure 2. Path result with (Factor loadings, P) for outer model and (β, *p*) for inner model.

Table 4. Direct and Mediating Effects.

Effect	Hypothesis	Path	β	*t*	*p*	Result
Direct	H7	CLP -> AIA	0.21	3.2	.00	supported
		CLP -> RA	0.34	5.68	.00	supported
		COMPA -> OR	0.21	3.63	.00	supported
	H2	COMPL -> AIA	−0.28	6.28	.00	supported
	H6	CP -> AIA	0.25	4.31	.00	supported
		CP -> RA	0.44	6.94	.00	supported
	H5	OR -> AIA	0.16	2.27	.02	supported
	H1	RA -> AIA	0.26	4.54	.00	supported
		TMS -> OR	0.67	15.38	.00	supported
Mediators	H4	TMS -> OR -> AIA	0.11	2.24	.02	supported
		CLP -> RA -> AIA	0.09	3.44	.00	supported
	H3	COMPA -> OR -> AIA	0.08	1.8	.04	supported
		CP -> RA -> AIA	0.12	3.82	.00	supported

coefficients of 0.21 and 0.67, and CP and CLP, together, explained 48% of the variance in relative advantage with positive coefficients of 0.44 and 0.34. Every path has a significance level of $p < .001$.

The results of the detailed mediating role or indirect effects showed that the RA between CP & AIA (β = .12, $p = .00$) and CLP & AIA (β = .09, $p = .00$) played a significant mediating function. Additionally, there was a significant mediation effect of OR between COMPA & AIA (β = .08, $p = .04$) and TMS & AIA (β = .11, $p = .02$).

Discussion

The empirical findings underscore key factors within the TOE framework that aid in understanding innovative AI technology in PR and SC. The subsequent sections explore these factors and their implications.

Technological Context

Complexity significantly hinders the adoption of AI in PR and SC agencies. Several factors contribute to this challenge, including employees' unfamiliarity with AI tools, the substantial mental effort needed for implementation, both management and staff's lack of awareness regarding modern AI technologies and their benefits, and the skills required to use these technologies being beyond the capabilities of agency employees. Together, these elements create barriers to the widespread adoption of AI in these agencies.

While our argument regarding the negative relationship between complexity and AI adoption is supported by extensive scholarly work (Al-khatib, 2023; Neumann et al., 2024; Prasad Agrawal, 2024), Simina and Dutescu (2024) found that complexity does not hinder the application of AI. This is because companies often hire specialized employees or develop the skills of their existing workforce to effectively work with AI solutions.

Contrary to studies like Prasad Agrawal (2024) and Alsheibani et al. (2020), we found that compatibility does not directly influence an agency's decision to adopt AI. Instead, our findings indicate that compatibility significantly affects AI adoption through organizational readiness. This readiness is influenced by factors such as aligning AI technologies with agency operations, supporting infrastructure for modern AI, ensuring alignment with agency goals and culture, and facilitating seamless integration with existing systems. However, numerous scholars argue that compatibility is a key factor when a company chooses to implement a new technological solution (Simina & Dutescu, 2024).

When PR and SC agencies allocate financial resources to adopt AI technologies, train employees in the latest methods, update their infrastructure, cultivate an innovative culture that embraces technology and creativity, and adapt their organizational structure to align with AI advancements, AI adoption can proceed smoothly. This alignment fosters a positive impact, increasing the likelihood of successful AI integration.

Unlike the findings of Prasad Agrawal (2024), which indicated that perceived relative advantage was not a significant factor, our study shows that relative advantage has a direct and substantial impact on AI adoption in PR and SC agencies. This finding is supported by several studies that explored AI and innovations adoption, such as Badghish and Soomro (2024); Felemban et al. (2024); Al-khatib (2023); Alsheibani et al. (2020); and Neumann et al. (2024).

In PR and SC agencies, AI technologies enable staff to conduct more efficient and effective campaigns, saving time on routine tasks such as creating contact lists, scheduling meetings, and sending follow-up emails. The implementation of AI in PR and SC agencies enhances competitive edge, operational efficiency, and productivity. Additionally, AI empowers employees to conduct thorough desk research for campaign planning and management, allowing for more effective audience data analysis and improved client media relations compared with existing tools. This suggests that the perceived benefits of AI are a key driver of its adoption. Our findings indicate that PR and SC agencies recognize the advantages of integrating AI to strengthen their competitive position.

Organizational Context

Senior management support does not directly affect AI adoption in PR and SC agencies; instead, it enhances organizational readiness, which subsequently promotes AI adoption. Agencies whose leaders back employee-driven AI initiatives and prioritize AI technology inclusion are better positioned for AI adoption. They tend to engage in activities such as securing financial resources to implement AI technologies and rewarding employees skilled in AI. However, many studies found a direct relationship between top management support and AI adoption, such as (Merhi & Harfouche, 2024; Shang et al., 2023; Simina & Dutescu, 2024).

Agency readiness directly influences AI adoption. PR and SC agencies that allocate financial resources to new technologies are more likely to embrace AI. Agencies that train employees in the latest AI methods, consistently update their infrastructure, cultivate a culture of innovation, and adapt their organizational structure to advancements are better positioned to adopt AI. Our argument is supported by many previous scholars, such as Shang et al. (2023).

Environmental Context

The competitive environment plays a crucial role in encouraging AI adoption among firms, particularly those in high-competition sectors. Agencies in competitive landscapes are more likely to adopt AI technologies and take a proactive stance, fostering greater innovation and strategies to maintain their competitive advantage. Findings indicate that most agencies adopting AI perceive higher competitive pressure, which acts as a catalyst, making them more receptive to AI. According to Prasad Agrawal (2024), when competitors adopt AI as a strategic advantage, it amplifies the concern for differentiation among adopters compared to non-adopters. PR and SC agencies believe that integrating AI will significantly impact their competitive landscape, making it essential for them to remain relevant in the market. Our findings align with previous research showing that competitive pressure significantly influences new technology adoption (Jia et al., 2017; Kajla et al., 2024; Salah & Ayyash, 2024). However, Al-khatib (2023) shows that competitive pressures have little impact on generative AI adoption, highlighting a unique opportunity for innovation without major external challenges. This idea is supported by Olfat (2024), who found that coercive and normative pressures had no significant effect on technology adoption.

Client pressure is crucial in AI adoption within PR and SC agencies. Our findings demonstrate a direct

connection between client pressure and AI adoption, supported by scholars like Kajla et al. (2024). Furthermore, client pressure significantly influences the perceived relative advantage of AI. They are motivated to adopt AI technologies driven by client pressure, as key clients expect agencies to utilize the latest technologies, including AI, to enhance business growth. Additionally, PR and SC agencies recognize that their key clients have substantial knowledge and experience with AI's benefits, which influences the adoption process. Finally, client demands for faster delivery further propel these agencies toward adopting AI technologies.

Theoretical Contributions

This study empirically validates the TOE approach as a useful tool for understanding AI adoption in PR and SC agencies, highlighting its capacity to assess relevant factors influencing adoption determinations. While the TOE framework has been widely applied across various industries for technology adoption studies (Al-khatib, 2023; Badghish & Soomro, 2024; Felemban et al., 2024; Merhi & Harfouche, 2024; Salah & Ayyash, 2024), its specific application and empirical validation in the context of PR and SC agencies, particularly concerning AI adoption, has been limited. Our findings bridge this gap, affirming the framework's utility in a specialized communication domain and highlighting its capacity to assess relevant factors influencing adoption determinations in this unique professional landscape.

Our study identifies seven key determinants: client pressure, competitive pressure, compatibility, complexity, relative advantage, top management support, and organizational readiness. These insights reveal the significant influences on AI adoption and their importance in decision-making processes. This granular identification of factors, particularly within the PR and SC context, extends previous generalized technology adoption models (Rogers & Shoemaker, 1971; Rogers et al., 2014) by providing specific empirical evidence tailored to the nuances of the communication industry.

Specifically, our findings demonstrate that complexity acts as a significant barrier to AI adoption, aligning with established theories that suggest perceived difficulty hinders technology uptake (Berman et al., 2012; Rogers et al., 2014). This is further supported by our results, indicating that employees' unfamiliarity with AI tools, the substantial mental effort required for implementation, and a general lack of awareness regarding AI's benefits and necessary skills contribute to this negative relationship. This reinforces the need for developers to design user-friendly AI solutions and for agencies to invest in comprehensive training programs, as suggested by Simina and Dutescu (2024).

Conversely, other identified factors such as client pressure, competitive pressure, relative advantage, organizational readiness, compatibility, and top management support facilitate AI adoption. Our study reveals nuanced relationships among these factors, offering a more intricate understanding than previously assumed. For example, while some studies suggest a direct influence of compatibility on technology adoption (Alsheibani et al., 2020; Chatterjee et al., 2021; Prasad Agrawal, 2024; Simina & Dutescu, 2024), our findings indicate that compatibility significantly affects AI adoption indirectly through organizational readiness. This highlights the mediating role of an agency's internal capacity and alignment in leveraging compatible technologies, a contribution that refines the understanding of compatibility's impact within the TOE framework..

Furthermore, our research elucidates the indirect yet crucial roles of top management support and competitive pressure. We found that top management support does not directly affect AI adoption but significantly enhances organizational readiness, which subsequently promotes AI adoption. This aligns with the notion that leadership commitment is vital for fostering an environment conducive to technology integration (Iranmanesh et al., 2023; Lutfi et al., 2023; Merhi & Harfouche, 2024; Shang et al., 2023; Tjebane et al., 2022). Similarly, competitive pressure, while not always directly leading to adoption, significantly bolsters organizational readiness, making agencies more receptive to AI as a strategic tool to maintain market relevance (Jia et al., 2017; Kajla et al., 2024; Salah & Ayyash, 2024). These mediating relationships provide a deeper theoretical understanding of how external and internal pressures translate into actual AI adoption within PR and SC agencies.

Notably, our study challenges some previous assumptions by demonstrating that relative advantage has a direct and substantial impact on AI adoption in PR and SC agencies, a finding that contrasts with some prior research (Prasad Agrawal, 2024) but is strongly supported by a broader range of studies on AI and innovation adoption (Alsheibani et al., 2020; Al-khatib, 2023; Badghish & Soomro, 2024; Felemban et al., 2024; Neumann et al., 2024). This emphasizes the practical benefits and perceived superiority of AI tools as a primary driver for their integration into PR and SC operations, such as enhanced campaign efficiency, time-saving on routine tasks, improved competitive edge, and better data analysis capabilities.

Finally, our findings equip agencies with a clearer understanding of the challenges and facilitating factors for AI adoption, enabling them to anticipate obstacles and leverage enablers for successful implementation. This contribution is vital, as it provides empirically grounded insights that can inform strategic decision-

making and resource allocation for AI integration in PR and SC. The nuanced relationships identified, particularly the mediating roles of organizational readiness, offer a more sophisticated model for future research and practical application within the evolving landscape of AI in communication.

Implications for Practice

Understanding the factors that influence technology adoption is essential for PR and SC agencies to effectively implement AI tools (Kelm & Johann, 2024). The study identifies key factors affecting AI adoption, offering practical insights for decision-makers. PR and SC agencies can evaluate their readiness, pinpoint barriers, and formulate strategies to overcome them, while also utilizing enablers to foster a supportive environment for successful implementation.

For developers of AI tools, acknowledging complexity as a barrier is essential in influencing adoption decisions. Complexity significantly hinders the adoption of AI in PR and SC agencies. Developers should strategically consider the factors that contribute to this challenge, including employees' unfamiliarity with AI tools, the substantial mental effort needed for implementation, both management and staff's lack of awareness regarding modern AI technologies and their benefits, and the skills required to use these technologies being beyond the capabilities of agency employees.

Limitations and Directions for Future Research

This study offers valuable insights but also has limitations that suggest avenues for future research. Notably, its focus on PR and SC agencies in the Arab World presents an opportunity for further investigation into the applicability and impact of AI adoption in these fields across different geographical contexts.

Furthermore, our findings reveal that top management support and competitive pressure significantly bolster organizational readiness, which is essential for AI adoption, indicating an indirect impact. These results challenge previous assumptions and suggest a need for further investigation.

Conclusion

This study critically examines the factors influencing the adoption of AI within PR and SC agencies, utilizing the TOE framework. While the TOE framework has been widely used across various industries to understand technology adoption, its empirical validation and specific application within the unique context of PR and SC agencies, particularly regarding AI, has remained largely unexplored. Our research addresses this significant gap, confirming the framework's robust utility in this specialized communication field and illuminating its ability to assess the diverse factors that shape adoption decisions within this unique professional landscape.

Our findings reveal several novel and surprising insights that go beyond merely reaffirming existing theories. Firstly, we identified seven key determinants influencing AI adoption: client pressure, competitive pressure, compatibility, complexity, relative advantage, top management support, and organizational readiness. By detailing these factors specifically within the PR and SC context, we provide empirical evidence that refines generalized technology adoption models to the unique dynamics of the communication industry.

Interestingly, our analysis revealed complex mediating relationships that challenge previous assumptions about technology adoption. For instance, while compatibility is usually seen as a direct factor driving technology adoption, our study indicates that its effect on AI adoption is significantly influenced by organizational readiness. This finding emphasizes the importance of an organization's internal capacity and strategic alignment in effectively utilizing compatible technologies. It suggests that simply having a technological fit is not enough; organizations must also be prepared, which includes having adequate training and financial resources. Shang et al. (2023) found that one of the main barriers to AI adoption is the lack of skilled employees trained in AI.

Furthermore, our research emphasizes the indirect yet crucial roles of top management support and competitive pressure. We found that top management support does not directly influence AI adoption but significantly enhances organizational readiness, which, in turn, promotes AI adoption. This underscores that leadership commitment, while not a direct influence on AI integration, is essential for fostering an environment conducive to technology assimilation. Similarly, competitive pressure does not force adoption directly; rather, it significantly enhances organizational readiness, making agencies more receptive to using AI as a strategic tool for maintaining market relevance. These mediating relationships deepen our theoretical understanding of how external market dynamics and internal leadership influence tangible AI adoption within PR and SC agencies.

One of the most striking findings is the direct and substantial impact of relative advantage on AI adoption in PR and SC agencies. This contrasts with some prior research that downplays its immediate influence, yet it is strongly supported by a broader body of literature on innovation adoption. This emphasizes that the perceived practical benefits and superior capabilities of AI tools, such as enhanced campaign efficiency, improved data

analytics, and streamlined operations, are primary drivers for their integration into PR and SC practices. This finding is particularly relevant for AI policy, suggesting that demonstrating clear and tangible advantages is crucial for accelerating adoption in professional service sectors.

This study significantly enhances the TOE framework by providing empirical validation in a previously underresearched area. By uncovering complex mediating relationships, particularly regarding compatibility and top management support, we offer a more nuanced understanding of how organizations adopt technology. Our findings indicate that future theoretical models should incorporate these indirect pathways instead of relying solely on simplistic direct correlations. This approach will help capture the intricate interplay of internal and external factors. Additionally, the identified mediating roles of organizational readiness and relative advantage present valuable opportunities for developing more sophisticated theoretical constructs in technology adoption research.

The insights gained from this study suggest several potential areas for future research. Researchers could investigate the specific elements of "organizational readiness" that are most crucial for mediating the effects of compatibility and top management support. Further qualitative research could examine the processes involved in these mediating factors, offering a deeper contextual understanding. Additionally, comparative studies across different geographical regions or sizes of PR/SC agencies could uncover variations in the identified factors and their relationships. It would also be valuable to explore the long-term effects of AI adoption on agency performance, client satisfaction, and employee roles. Finally, due to the rapid development of AI technology, longitudinal studies are necessary to monitor how these adoption factors could evolve.

Our findings have substantial implications for policymakers and industry bodies seeking to promote responsible and widespread AI adoption in PR and SC. The significant negative impact of "complexity" underscores the need for policies that promote the development and dissemination of user-friendly AI solutions, coupled with accessible training programs. Furthermore, recognizing the mediating role of "organizational readiness" suggests that policy initiatives should focus not just on technological availability but also on supporting agencies in building their internal capacity, fostering innovation cultures, and providing resources for infrastructure updates. The strong influence of "relative advantage" implies that policies should highlight and facilitate the demonstration of tangible benefits of AI, perhaps through case studies, success stories, and industry benchmarks. Finally, understanding the indirect influence of "competitive pressure" and "client pressure" can inform strategies that leverage market dynamics to encourage adoption, such as promoting industry standards for AI integration or facilitating client-agency dialogues on AI expectations.

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Ethical Considerations

This study was conducted in accordance with the ethical standards of An-Najah National University and the APA Code of Ethics. In line with institutional and national guidelines, formal ethics approval was not required, as the study involved minimal risk and did not collect personal or sensitive information. Participation was voluntary and anonymous, and informed consent was obtained from all participants before completing the questionnaire.

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Data Availability Statement

Data sharing does not apply to this article, as no datasets were generated or analyzed during the current study.

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