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Factors Predicting Interior Preferences for Vihara or Ubosot

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Abstract

Designers need to comprehend people's preferences to produce enjoyable environments. This research investigated how coherence, complexity, legibility, and mystery can anticipate the interior preferences of Vihara or Ubosot in various architectural styles. Forty-five students were taken to 19 temples and asked to complete an online survey. The findings revealed that coherence, legibility, and mystery were predictors of interior preferences, except for complexity. Moreover, coherence was the only predictor for the Sukhothai style, while coherence and mystery were predictors for the Ayutthaya style. On the other hand, all four variables predicted interior preferences for the Lanna style.

Keywords: Interior Preference; Preference for Thai Interior Space; Predictors of Interior Preference; Traditional Interior Architecture

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1.0 Introduction

The preference issue has become increasingly important in various fields, including landscape, architecture, and interior design (Herzog & Bryce, 2007; Herzog et al., 2011; Nasar, 1983; Scott, 1993a). Designers must understand how to create an appealing environment that promotes positive thinking, behavior, and well-being (Ham et al., 2004). To predict human preferences for their environment, Kaplan and Kaplan (1989) proposed a model that includes four key predictors: coherence, complexity, legibility, and mystery. For example, previous research in landscape design has found that mystery, visual access, and legibility are correlated with preference and perceived danger in forest settings (Herzog & Bryce, 2007; Herzog & Kirk, 2005; Herzog & Kropscott, 2004; Herzog & Miller, 1998). Similarly, some studies have focused on the relationship between architectural design features and preferences, including building age and facade (Fawcett et al., 2008; Herzog et al., 2011). However, little research has focused on interior preferences.

Scott (1993a) indicated the importance of interior preferences. He found that complexity and mystery were positively correlated with interior preferences in public, institutional, and commercial buildings. At the same time, legibility and coherence influenced customers' preference for open spaces in shopping malls (Hami et al., 2018). However, religious buildings, such as houses of worship, churches, and temples, have received little attention regarding interior preferences, and the relationship between building age and interior preferences is still unknown (Hami et al., 2018). The study of religious buildings and interior preferences may fill this research gap.

Buddhism is Thailand's primary religion, and many temples are in many locations in the country. Each temple consists of two main buildings called "image hall (Vihara) or the Buddhist temple's ordination hall (Ubosot)." These buildings have been used for Buddhist

religious ceremonies and built from the past to the present with different styles such as Sukhothai (A.D.1238-1438), Ayutthaya (A.D.1351-1767), and Lanna (A.D.1292-1775) styles. The interior spaces of these buildings were decorated with the ultimate intention of paying respect to the Lord Buddha.

This study investigated how coherence, complexity, legibility, and mystery can predict the interior preferences of Vihara and Ubosot. Therefore, the study hypothesizes that these four variables were predictors of interior preferences and seeks to determine which variable is the best predictor of interior preferences. Additionally, the study explored how these four predictors can explain interior preferences for each style.

2.0 Literature Review

2.1 Preference and its Predictors

In 1989, Kaplan and Kaplan introduced a predictive model for determining people's preferences based on the evolutionary principle that humans tend to select environments that provide more information for safety, food gathering, and orientation. The model identified coherence, complexity, legibility, and mystery as crucial for predicting preferences. Additionally, Kaplan and Kaplan developed The Kaplans' (1989) Preference Matrix, which outlined two significant aspects of people's relationship with information (refer to Table 1). The first aspect pertained to understanding and exploring the environment, while the second aspect involved data availability at both immediate and inferred levels. Although the model has been widely used in landscape and architecture, its use in interior architecture must be well-documented. In 1993, Scott proposed a relationship between complexity, mystery, and interior preferences, while some earlier research focused on the connection between visual attributes and interior preferences. The relevance of the four predictors to interior preferences has since gained greater significance.

Table 1: The Kaplans' (1989) Preference Matrix

	Understanding	Exploration
Immediate	Coherence	Complexity
Inferred, Predicted	Legibility	Mystery

2.2 Interior Preferences and Building Types

Research has explored preferences across various types of buildings, including restaurants, offices, and residences (Fawcett et al., 2008; Ham et al., 2004; Hami et al., 2018). Previous studies have suggested that designers must comprehend the preferences and cultures of their users to create a desirable environment (Ham et al., 2004). Cultural factors often influenced architectural styles, with Buddhism being the dominant religion in Thailand. Buddhist temples are widespread throughout the country, and their architectural styles vary depending on their location and the period in which they were constructed. However, the connection between religious buildings and interior preferences remains to be determined.

2.3 Methods for Assessing Preference

Previous research utilized black-and-white photographs of landscapes, architecture, or interior architecture as a stimulus tool, using card sorting and content analysis to evaluate the levels of coherence, complexity, legibility, and mystery (Dickson & White, 1999; Fawcett et al., 2008; Ham et al., 2004; Herzog & Bryce, 2007; Herzog et al., 2011; Herzog & Kirk, 2005; Scott, 1993a, 1993b). Although this approach helps present numerous pictures to participants, it needs ecological validity. Therefore, the present study aimed to escort all participants to an actual setting to enhance ecological validity. Additionally, the method for assessing the levels of the four predictors was altered to an online questionnaire, allowing participants to easily rate their own experiences without researcher intervention. Therefore, a 7-point semantic differential scale was used for assessment instead of the 5-point Likert scale.

3.0 Methodology

This research approach was quantitative because it aimed to verify Kaplan's model of environmental preference. All variables were measured and assessed using a Google Forms questionnaire. Statistical methods analyzed the collected data. The research design was a survey as it was conducted in actual buildings without changing any circumstances.

3.1 Sample

The participants comprised 45 fourth-year students from the Department of Interior Architecture, School of Architecture, Art and Design, King Mongkut's Institute of Technology Ladkrabang. They were one male and 44 females. Their ages varied from 20-22, with a mean age of 21.5 ($SD=2.85$). They participated in two field trips. The first trip was held between 9-15 October 2022, and the participants were escorted to the temples in the central region, such as Ayutthaya, Suphan Buri, Phetburi, and Lopburi. The second trip was held between 21-29 January 2023, and the participants were escorted to temples in the northern region, such as Tak, Kampanghphet, Sukhothai, Lampang, and Chiang Mai. As they experienced specific interior spaces of each style, the participants might gain knowledge of the interior decoration styles. As a result, they might familiarize themselves with the styles of interior spaces.

3.2 Research Settings

Most selected Viharas or Ubosots were registered as archaeological sites by the Office of Fine Arts Department. They were in good condition and well maintenance of interior spaces. Lastly, they were on the list of two field trips, so they were good examples of traditional Thai architecture and unique, identical, and beautiful buildings. According to these criteria, three Sukhothai-style buildings were in good condition, whereas the others were ruined. (See Fig.1). Moreover, 11 buildings were Ayutthaya style (See Fig.2), and five buildings were classified as Lanna style (See Fig.3). The interior spaces of these buildings were enclosed by basement, vertical and overhead planes. The Buddha statue was at the end of the long side of the buildings. The columns that supported the roof structure divided some large interior spaces. The spaces and planes were articulated with specific ornaments, patterns, and valuable materials.

According to Kaplans' model of preference, the interior spaces with these features were harmonious and made the area coherent and understandable. In addition, the interior rooms were legible because the Buddha statue and columns became a landmark and directions for aiding wayfinding. But on the other hand, the interior spaces were as complex as the amount and functions of visual attributes present. This led to the mystery of the interior spaces encouraging one to enter more deeply into the larger environment and could gain interesting new information.



Fig. 1 : Examples of Vihara or Ubosot for Sukhothai style
(Source: Authors)



Fig. 2 : Examples of Vihara or Ubosot for Ayutthaya style
(Source: Authors)



Fig. 3 : Examples of Vihara or Ubosot for Lanna style
(Source: Authors)

3.3 Procedure

Upon arrival at the temple, the participants were accompanied to the Vihara or Ubosot building. They were seated in the middle of the building, and the researcher explained the purpose of the study and requested their consent. Subsequently, the participants were sent a link to a Google online questionnaire, which included five significant questions that assessed the levels of coherence, complexity, legibility, mystery, and interior preference. In addition, a 7-point semantic differential scale was utilized to rate all aspects, as presented in Table 2. The participants had 15 minutes free to submit their completed questionnaire once they finished. Then, they spent the other 15 minutes listening to the interior space's knowledge.

Table 2. Definitions of rating variables

Variables	Definition	Assessment
1) Interior Preference	How much do you like the interior architecture of this Vihara or Ubosot?	This question aims to assess the opinion of participants linked to the setting. The participants can rate from 1-very dislike to 7-very like.
2) Coherence	How do you rate the level of coherence for the interior architecture of this Vihara or Ubosot?	This question means to assess how well-organized the interior space is that you see immediately. The rating scale ranges from 1-very poorly organized to 7-very well organized.
3) Complexity	How do you rate the complexity of the interior architecture of this Vihara or Ubosot?	It refers to the amount of visual information derived from interior space, such as decoration, natural material, and curves in articulated walls. The rating scale ranges from 1-very uncomplicated to 7-very complicated.
4) Legibility	How well the arrangement of interior architecture supports wayfinding and distinctiveness.	It assesses how interior architecture can arouse participants to seek new information. The rating scale ranges from 1-very poorly understanding to 7-very well understanding.
5) Mystery	How much the interior architecture encourages the participants to explore new information.	It assesses how interior architecture can arouse participants to seek new information. The rating scale ranges from 1-very poorly attractive to 7-very well attractive.

4.0 Findings

This study focused on two key research questions. The first question determined the predictive ability of coherence, complexity, legibility, and mystery regarding interior preferences for Vihara or Ubosot. The second question investigated how well these factors predicted interior preferences for specific styles of Vihara or Ubosot. The data collected from both questions were thoroughly examined for missing data, central tendency, data dispersion, outliers, and normality to ensure its suitability for statistical analysis. In addition, standard multiple regression was employed to assess the extent to which the four predictors could explain the variance in interior preference scores.

4.1 Interior Preference and Related Factors

The multicollinearity assumption was examined, and the correlation analysis between complexity and legibility yielded a low value below 0.3. Therefore, there was no multicollinearity observed among the four predictors. The Adjusted R Square value for the model evaluation was 0.335, indicating that the model accounted for 33.5% of the variance in interior preference (refer to Table 3). The model was statistically significant (Sig. = .000). Table 4 revealed that mystery, coherence, and legibility were statistically significant unique contributors to the equation. The beta coefficient for mystery was the highest at .354, followed by coherence (.282) and legibility (.072),

respectively. Therefore, it can be concluded that mystery, coherence, and legibility are predictors of interior preferences for traditional Thai architecture.

Table 3. Model Summary^b of the three styles of Vihara or Ubosot

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.582 ^a	.339	.335	1.001

a. Predictors: (Constant), Level of Mystery, Level of Legibility, Level of Complexity, Level of Coherence

b. Dependent variable: Interior Preference

Table 4. Coefficients^a of the three styles of Vihara or Ubosot

		Understandardized		Standardized		95.0% Confidence Interval for B		Correlations			
		Coefficients		Coefficients							
Model		B	Std.Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	1.329	.233	-	5.703	.000	.871	1.786	-	-	-
	Level of Coherence	.309	.040	.282	7.665	.000	.230	.389	.487	.276	.234
	Level of Complexity	.022	.034	.024	.663	.507	-.044	.089	.315	.025	.020
	Level of Legibility	.068	.029	.072	2.332	.020	.011	.124	.153	.087	.071
	Level of Mystery	.354	.038	.354	9.279	.000	.279	.429	.517	.328	.283

a. Dependent Variable : Interior Preference

4.2 Interior Preference and Related Factors for Sukhothai Style

When evaluating the model, the Adjusted R Square value was 0.25, which means that the model explained 25% of the variance in interior preference. (refer to Table 5), Moreover, the model reached statistical significance (Sig. = .000). Table 6 showed that coherence was a statistically significant unique contribution to the equation. The largest beta coefficient of coherence was .409. In conclusion, coherence is only the predictor of interior preferences for the Sukhothai style.

Table 5. Model Summary^b of the Sukhothai style

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.524 ^a	.275	.250	.994

a. Predictors: (Constant), Level of Mystery, Level of Legibility, Level of Complexity, Level of Coherence

b. Dependent variable: Interior Preference

Table 6. Coefficients^a of the Sukhothai style

		Understandardized Coefficients		Standardized Coefficients		95.0% Confidence Interval for B		Correlations			
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	1.720	.536	-	3.211	.002	.659	2.781	-	-	-
	Level of Coherence	.422	.096	.409	4.377	.000	.231	.613	.493	.376	.346
	Level of Complexity	.131	.077	.156	1.690	.094	-.022	.284	.329	.155	.134
	Level of Legibility	.110	.068	.130	1.619	.108	-.025	.245	.192	.149	.128
	Level of Mystery	-.012	.088	-.012	-.133	.894	-.186	.163	.244	-.012	-.011

a. Dependent Variable : Interior Preference

4.3 Interior Preference and Related Factors for Ayutthaya Style

When evaluating the model, the Adjusted R Square value was 0.351, which means that the model explained 35.1% of the variance in interior preference. (refer to Table 7), Furthermore, the model reached statistical significance (Sig. = .000). Table 8 showed that mystery and coherence were statistically significant unique contributions to the equation. The largest beta coefficient of mystery was .443, and coherence was .198, respectively. In conclusion, mystery and coherence predict interior preferences for the Ayutthaya style.

Table 7. Model Summary^b of the Ayutthaya style

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.598 ^a	.358	.351	1.000

a. Predictors: (Constant), Level of Mystery, Level of Legibility, Level of Complexity, Level of Coherence

b. Dependent variable: Interior Preference

Table 8. Coefficients^a of the Ayutthaya style

		Understandardized Coefficients		Standardized Coefficients		95.0% Confidence Interval for B		Correlations			
Model		B	Std. Error	Beta	t	Sig	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	1.264	.336	-	3.764	.000	.604	1.924	-	-	-
	Level of Coherence	.231	.056	.198	4.109	.000	.120	.341	.452	.200	.163
	Level of Complexity	.040	.046	.041	.860	.390	-.051	.130	.350	.043	.034
	Level of Legibility	.046	.040	.046	1.138	.256	-.033	.125	.066	.056	.045
	Level of Mystery	.448	.051	.443	8.714	.000	.347	.549	.566	.397	.346

a. Dependent Variable : Interior Preference

4.4 Interior Preference and Related Factors for Lanna Style

When assessing the model, the Adjusted R Square value was 0.388, which means that the model explained 38.8% of the variance in interior preference. (refer to Table 9), Furthermore, the model reached statistical significance (Sig. = .000). Table 10 showed that mystery, coherence, and legibility were statistically significant unique contributions to the equation. The largest beta coefficient of mystery was .384, followed by coherence (.325), legibility (.171), and complexity (-.147), respectively. In conclusion, mystery, coherence, and legibility are the predictors of interior preferences of traditional Thai architecture.

Table 9. Model Summary^b of the Lanna style

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.633 ^a	.401	.388	.930

a. Predictors: (Constant), Level of Mystery, Level of Legibility, Level of Complexity, Level of Coherence

b. Dependent variable: Interior Preference

Table 10. Coefficients^a of the Lanna style

		Understandardized Coefficients		Standardized Coefficients		95.0% Confidence Interval for B		Correlations			
Model		B	Std. Error	Beta	t	Sig	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	1.677	.407	-	4.120	.000	.874	2.480	-	-	-
	Level of Coherence	.328	.069	.325	4.757	.000	.192	.464	.519	.335	.275
	Level of Complexity	-.147	.065	-.147	-2.268	.025	-.275	.019	.149	-.197	-.131
	Level of Legibility	.144	.051	.171	2.815	.005	.043	.244	.303	.206	.163
	Level of Mystery	.380	.071	.384	5.356	.000	.240	.520	.528	.372	.310

a. Dependent Variable : Interior Preference

5.0 Discussion

Kaplan's model (1989) of environmental preference suggested that coherence, complexity, legibility, and mystery are essential factors in predicting preferences. However, for Vihara and Ubosot, only coherence, legibility, and mystery were predictors of interior preferences. This differs from previous studies that identified complexity as the main factor affecting interior preferences. Ham et al. (2004) defined complexity as visual richness and found it to be a predictor of preference in new styles of buildings. However, the level of complexity may be low due to the typical characteristics of the interior architecture in Vihara or Ubosot, such as the Buddha image, interior decoration, layout, painting, and lighting. In addition, the participants were familiar with these buildings, and this feeling may influence interior preferences (Ham et al., 2004). As a result, this situation may make it difficult for participants to differentiate between different styles and result in a low level of complexity, which could explain the insignificant relationship between complexity and interior preference.

In addition, coherence was found to be a significant predictor of interior preferences in all styles for Vihara or Ubosot of traditional Thai architecture. Coherence refers to the organization of internal elements and spaces of every kind, like Vihara or Ubosot. For example, the main entrance is at the front of the building, the main hall is in the middle, and the Buddha image is at the end of the central axis inside the building. Ham et al. (2004) found that if the scenes were open spaces with explicit and straightforward spatial configurations, they had a strong sense of order for interior furnishings, lighting conditions, and accessories. In addition, they seemed to be in harmony, so the level of coherence was high. This situation can lead to a good relationship between coherence and interior preferences for Vihara or Ubosot.

For Sukhothai and Ayutthaya styles, the patterns of interior space are similar and straightforward, leading to a low level of complexity. The participants also had previous experiences with these types of buildings. In addition, they were familiar with the interior space, so they felt simple. In contrast, the spatial form of Lanna's style has more different spatial forms than Ayutthaya and Sukhothai. This other issue can arouse participants' feelings and increase the level of pleasure and interior preference. Therefore, the study concludes that

coherence, complexity, legibility, and mystery predict interior preferences. The summary of the four factors affecting interior preferences is shown in Table 11.

Table 11. Summary of the relationship between the four factors affecting interior preferences				
	Coherence	Complexity	Legibility	Mystery
All three styles	✓	-	✓	✓
Sukhothai style	✓	-	-	-
Ayutthaya style	✓	-	-	✓
Lanna style	✓	✓	✓	✓

Interior
Preference

6.0 Conclusion and Recommendation

Theoretically, this study indicated that coherence, legibility, and mystery predict interior preferences for Vihara or Ubosot. But, surprisingly, complexity is not a predictor of interior preferences because the styles of the interior architecture of Vihara and Ubosot are similar. These crucial findings can fill the gaps in environmental preference, especially regarding interior preference in religious buildings. In addition, this study used a new way of assessing interior preferences from static pictures (two-dimensional scenes) to the dynamic views (three-dimensional scenes) of participants in real places.

The limitation of this research is a generalization because most participations were university students and primarily female. Therefore, it might not be a generalization to other age and gender groups. Second, when the same participants visited all Viharas or Ubosots, they perceived similar visual information and functions of environmental cues. They were familiar with the interior spaces of Vihara or Ubosot, so they may consider interior spaces simple. Instead, this feeling may decrease levels of complexity and arousal feeling. Therefore, this situation may influence the relationship between complexity and interior preferences.

Further research should consider using participants that are different in age groups and gender. Next, familiarity has become an intervening variable that influences interior preferences. The researcher should be concerned about this situation. Finally, as this study focused on the relationship between coherence, complexity, legibility, mystery, and interior preferences for Vihara or Ubosot, future research should consider the influence of visual attributes such as color, light, and decoration on interior preferences.

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Paper Contribution to Related Field of Study

This paper contributes to the field of environmental psychology in terms of interior preference because it fills the gaps in Kaplan's model of environmental preference in terms of interior preference.

References

- Dickson, A., & White, A. C. (1999). Developing a Methodology for Assessing Children's Preferences for Nonresidential Interior Spaces. *Journal of Interior Design*, 25(2), 32-44.
- Fawcett, W., Ellingham, I., & Platt, S. (2008). Reconciling the Architectural Preferences of Architects and the Public: The Ordered Preference Model. *Environment and Behavior*, 40(5), 599-618.
- Ham, T. Y., Guerin, D. A., & Scott, S. C. (2004). A Cross-Cultural Comparison of Preference for Visual Attributes in Interior Environments: America and China. *Journal of Interior Design*, 30(1), 37-50.
- Hami, A., Moula, F. F., & Maulan, S. B. (2018). Public preferences toward shopping mall interior landscape design in Kuala Lumpur, Malaysia. *Urban Forestry & Urban Greening*, 30, 1-7.
- Herzog, T. R., & Bryce, A. G. (2007). Mystery and Preference in Within-Forest Settings. *Environment and Behavior*, 39(6), 779-796.
- Herzog, T. R., Gray, L. E., Dunville, A. M., Hicks, A. M., & Gilson, E. A. (2011). Preference and Tranquility for Houses of Worship. *Environment and Behavior*, 45(4), 504-525.
- Herzog, T. R., & Kirk, K. M. (2005). Pathway Curvature and Border Visibility as Predictors of Preference and Danger in Forest Settings. *Environment and Behavior*, 37(5), 620-639.
- Herzog, T. R., & Kropscott, L. S. (2004). Legibility, Mystery, and Visual Access as Predictors of Preference and Perceived Danger in Forest Settings without Pathways. *Environment and Behavior*, 36(5), 659-677.
- Herzog, T. R., & Miller, E. J. (1998). The Role of Mystery in Perceived Danger and Environmental Preference. *Environment and Behavior*, 30(4), 429-449.
- Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. Cambridge university press.

- Nasar, J. L. (1983). Adult Viewers' Preferences in Residential Scenes: A Study of the Relationship of Environmental Attributes to Preference. *Environment and Behavior*, 15(5), 589-614.
- Scott, S. C. (1993a). Complexity and Mystery as Predictors of Interior Preferences. *Journal of Interior Design*, 19(1), 25-33.
- Scott, S. C. (1993b). Visual Attributes Related to Preference in Interior Environments. *Journal of Interior Design Education and Research*, 18(1-2), 7-16.