Proposal for Integration Design Factors in the Ansan Multicultural Special Zone in Korea from a Multinational Perspective

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Abstract: In recent years, multicultural special zones have become a focal point for researchers both domestically and internationally due to their rich cultural diversity. However, the Daehwa-dong area of Wongok-dong in Ansan, Korea's first multicultural village special zone, has not achieved the desired development outcomes. This paper aims to provide design recommendations for Ansan's multicultural special zone by conducting a comparative analysis of design variables of multicultural commercial streets in different regions. This study employs SAS 9.4 statistical software to perform Pearson correlation analysis and path analysis on the Ansan Multicultural Special Zone, Seoul's Garibong Central Market, and Incheon Chinatown. By comparing different path variable models, the study reveals the critical roles of "symbolism" and "Trendiness" in enhancing the vitality of Ansan's multicultural special zone. The research results provide theoretical and practical guidance for the design of multicultural special zones. Exploring the construction of multicultural cities amidst globalization, immigration trends, and tourism booms. However, Ansan's Wongok-dong, as South Korea's first multicultural village special zone, has not achieved the anticipated developmental outcomes. This study employs quantitative methods to provide design recommendations for Ansan's multicultural special zone through comparative analyses of design variables across multicultural commercial streets in different regions. Using SAS 9.4 statistical software, Pearson correlation and path analyses were conducted on Ansan's multicultural special zone, Seoul's Daerim

Central Market, and Incheon's Chinatown. Comparative analysis of different path variable models revealed direct and indirect impacts of Convenience (CO), Sociability (SO), Aesthetic (AE), Symbolism (SY), and Trendiness (TR) variables on multicultural areas. Specifically, the study highlighted: (1) in Ansan, Aesthetic, Convenience, and Trendiness significantly enhance Sociability, with Aesthetic playing a predominant role indirectly; (2) Seoul's market design effectiveness is directly influenced by Symbolism, underscoring its core role; and (3) in Incheon's Chinatown, Trendiness significantly impacts area vitality, closely correlated with Aesthetic, Convenience, and Sociability. The conclusion emphasizes the urgent need to enhance Aesthetic quality in Ansan and suggests gradual improvements through long-term planning. Seoul's market and Incheon's Chinatown demonstrate intricate interaction paths among the five design factors, with Symbolism (SY) and Trendiness (TR) playing crucial roles. This research offers both theoretical insights and practical guidance for the design of multicultural zones, with a focus on assisting urban planners and policymakers in revitalizing these areas. By promoting cultural integration and fostering economic development, the study aims to enhance the overall appeal and sustainability of multicultural special zones. Ultimately, it provides valuable insights into how strategic design elements can optimize these zones, offering significant implications for future urban development initiatives.
Keywords: Path Analysis, Multicultural Special Zone, Many-national Cultures, Fusion Design

1. INTRODUCTION

With the acceleration of globalization, urban areas exhibit unique characteristics of multicultural design. Richard Florida (Florida, 2006) posits that multicultural design can not only drive economic development but also attract international talent, enterprises, and investors, thereby bringing diverse thinking and innovative strategies. Sohrabi (Sohrabi, 2019) emphasizes that the openness of multicultural special zones attracts global migrants, fostering interaction and communication among people from different cultural backgrounds. Hassen and Giovanardi (Hassen & Giovanardi, 2018) argue that multicultural design provides cities with a unique image and brand, increasing international appeal and thereby attracting more tourists and investors. Azagra-Caro and Consoli (Azagra-Caro & Consoli, 2016) note that multicultural design promotes the integration of art, culture, and technology, driving technological innovation and progress. Fainstein (2014) stresses that urban planning needs to consider the needs and habits of residents from different cultural backgrounds. Hunter (Hunter, 2016) suggests that multicultural design poses new requirements for social stability and governance, necessitating

effective mechanisms to promote cultural exchange. Overall, multicultural design significantly impacts economic drive, openness, and brand shaping, while also introducing new challenges in urban planning (Kim, 2021). Since the 1980s, South Korea has gradually attracted foreign populations, with a significant increase in the number of immigrant workers and marriage migrants (Kim, 2014). A report on November 1, 2021, indicated that the number of foreign residents in South Korea had risen to 2,134,569, with Ansan having the highest number of foreign residents at 94,941 (Langstraat & Van Melik, 2013). Consequently, in 2009, the Wongok-dong area of Ansan was designated as South Korea's first multicultural village special zone (Chen & Tung, 2014; Choo & Currid-Halkett, 2020). and became an Intercultural City (ICC) in 2020 (Park, 2022; Yoon, 2010). In March 2023, the Ansan city government proposed a plan to develop a multicultural integrated residential-commercial special zone in the Wongok-dong multicultural village special zone, aiming to promote multicultural exchange and enhance multicultural acceptance (Jun & Ha, 2015). In the study of design dimensions for multicultural districts in Ansan (Jun, 2023), five key design variables were extracted and defined: convenience, sociability, aesthetics, symbolism, and trendiness. These variables are defined as follows:

- Convenience (CO): The degree of accessibility in the multicultural area.
- Sociability (SO): Interaction and sense of community among residents and visitors.
- Aesthetic (AE): The aesthetic level of street landscapes and buildings.
- Symbolism (SY): The presence of buildings or areas with unique representativeness or symbolic significance.
- Trendiness (TR): The extent to which the area becomes a popular spot or viral street on the internet. However, the recognition of these five design variables in multicultural commercial streets of different regions and their interrelation within each district have yet to be validated. Therefore, this study utilizes SAS 9.4 statistical software to conduct Pearson correlation analysis and path analysis on the Ansan Multicultural Special Zone, Seoul's Garibong Central Market, and Incheon Chinatown. By comparing different path variable models, this study aims to develop a more suitable multicultural design evaluation model for Ansan, providing theoretical and practical guidance for the design of multicultural special

zones.

2. SELECTION OF STUDY SITES

Comparing various case studies of multicultural commercial streets can provide deep insights into how different design elements impact these streets. However, since multicultural commercial streets in different countries and cities possess unique characteristics, the best way to analyze a multicultural commercial street within a particular country is by comparing it with other multicultural environments within the same country (Pantano et al., 2021; Woo et al., 2023). Incheon Chinatown, as the oldest Chinese enclave in Korea (Yoo et al., 2021), and Garibong Central Market in Seoul, a typical transnational social space in the capital region (Isensee et al., 2020), to some extent represent the current development status of Korea's multicultural commercial streets. From March 3 to April 10, 2023, specific field visits were conducted to confirm the study sites in Ansan Multicultural Special Zone (Wongok-dong, Ansan), Garibong Central Market (Garibong-dong, Yeongdeungpo District, Seoul), and Incheon Chinatown (Chinatown, Jung District, Incheon), as shown in Figure-1. By studying these three different areas, we can better understand the design requirements and actual effects of multicultural districts, providing empirical support for future design endeavors (Jaafari et al., 2016; Jo & Jung, 2017).

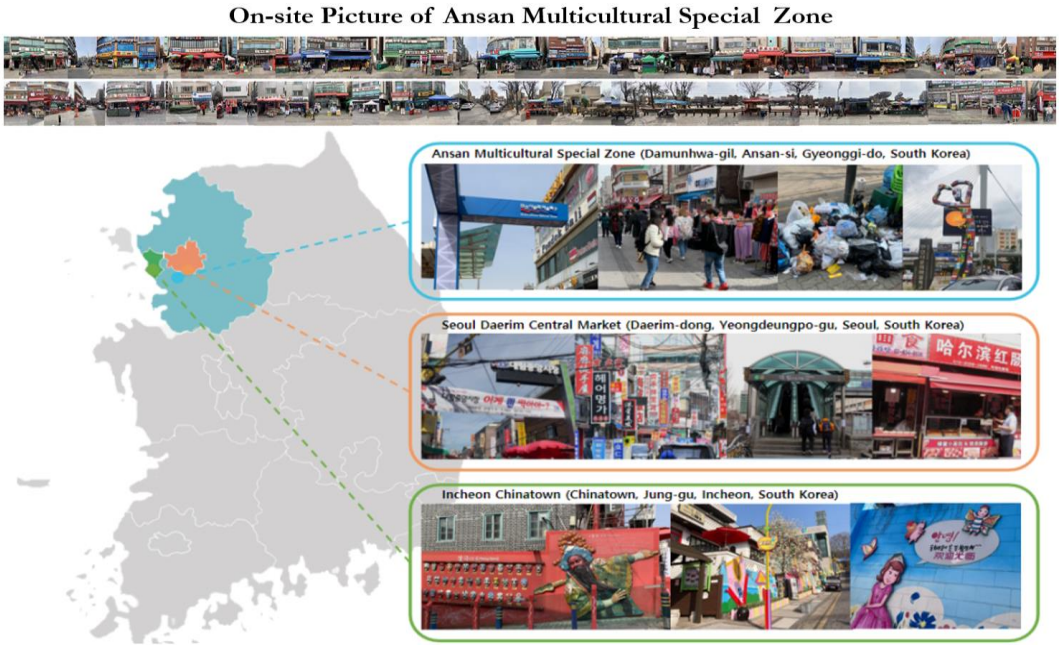

Figure 1: On-Site Picture of Ansan Multicultural Special Zone & Control of Experimental Site

3. RESEARCH METHODOLOGY

This study utilizes SAS 9.4 statistical software for data analysis, employing Pearson correlation analysis and path analysis to compare the causal relationships among residents and visitors of the multicultural commercial streets in Ansan Multicultural Special Zone, Seoul's Garibong Central Market, and Incheon Chinatown (Boyle, 1970). The aim is to elucidate the linear relationships and path coefficients among the five variables across these three commercial streets (Um & Cho, 2022). Path analysis, a method within Structural Equation Modeling (SEM), focuses on analyzing both direct and indirect relationships between variables (Seoul, 1998). Path coefficients are used to compare spatial relationships and test dynamic causal relationships, helping researchers identify causal chains between variables and assess the impact of different variables on the final outcomes (Hong & Jeon, 2015). Path models can simultaneously estimate multiple regression models, analyzing mediation, moderation, or interaction effects between variables (Heo, 2020).

Compared to methods such as Analytic Hierarchy Process (AHP) and Delphi method, path analysis models eliminate subjectivity, ambiguity, and randomness inherent in traditional analytical methods (Park & Garcia, 2020; Zhang et al., 2020). In urban design, path analysis has been widely used for analyzing relationships in variable models, forming a technical support system based on theoretical requirements (Jaafari et al., 2016; Rideout et al., 2019). During the research process, a Likert five-point scale questionnaire was developed based on the five design variables (Convenience, Sociability, Aesthetic, Symbolism, Trendiness) extracted and defined from related papers on Ansan Multicultural Special Zone (Tayarani N et al., 2011). The content and definitions of the variables are provided in Table-1. From March 3 to April 10, 2023, questionnaires were distributed in Incheon Chinatown, Seoul's Garibong Central Market, and Ansan Multicultural Special Zone, collecting a total of 142 valid responses through on-site surveys (51 participants) and online surveys (91 participants). Subsequently, based on the questionnaire results, feasibility validation was conducted by comparing research methods and experimental sites (Li et al., 2021). A path model was then established to compare the interaction paths of the five variables across the three multicultural commercial streets using path analysis and virtual variable model analysis (Lee & Park, 2018; Lee & Lou, 2019). Finally, by confirming

the total path effects of the three multicultural areas, path directions and priorities were drawn, leading to conclusions and recommendations for future designs.

Table 1: Research Process

Design a Five-Point Likert Scale Questionnaire		**Field Investigation**	**Field Questionnaires**
3 March to 10 April 2023			
Drawing a Questionnaire Based on Five Design Variables Extracted and Defined from Papers Related to Ansan Multicultural Special Zone		Visited Incheon Chinatown, Daelim Central Market in Seoul, Ansando Cultural Special Zone	On-site (51) and online (91) surveys, with a total of 142 valid questionnaires collected
Feasibility Testing	Path Analysis	Dummy Variable Model Analysis	Analysis Feedback
10 April to September 2023			
Feasibility Verification Before Path Analysis	Modelling the paths Comparing the paths of five variables on the interactions between three multicultural shopping streets	Prioritisation is confirmed by the total effect of the pathways in the three multicultural regions.	By mapping path directions (where the factors are pointing) and prioritisation Giving conclusions and recommendations for the future

Table 2: Factors and Definitions

Factor	**Definition**
Convenience (CO)	Degree of accessibility to multicultural zones
Sociability (SO)	The extent to which they are known through social networking
Aesthetic (AE)	The aesthetic level of street landscapes and buildings.
Symbolism (SY)	The presence of buildings or zones with distinct representativeness or symbolic significance
Trendiness (TR)	The extent to which it becomes an internet hotspot or becomes an internet famous street.

4. RESULTS

Between March 3 and April 10, 2023, we conducted a survey to assess the recognition of five design variables (Convenience, Sociability, Aesthetic, Symbolism, Trendiness) in Incheon Chinatown, Seoul's

Garibong Central Market, and Ansan Multicultural Special Zone. A total of 142 valid questionnaires were collected through on-site surveys (51 participants) and online surveys (91 participants). The participants included residents, foreign immigrants or temporary residents, and visitors who had previously visited Ansan Multicultural Special Zone, Seoul's Garibong Central Market, and Incheon Chinatown. Table-3 provides a detailed description of the participants' detial.

Table 3: Summarizes the Characteristics of the Participants(*N*=142)

Items		**On-site**	**Online**	**Total**
Age	20-24	8	30	38 (26.8%)
	25-29	36	33	69 (48.6%)
	30-34	5	17	22 (15.5%)
	35-39	2	11	13 (9.15%)
	Total	51	91	142 (100%)
Gender	Male	38	21	59 (41.5%)
	Female	13	70	83 (58.5%)
	Total	51	91	142 (100%)
Education level	High School	1	10	11 (7.75%)
	College degree	17	52	69 (48.6%)
	Higher than college degree	33	29	62 (43.7%)
	Total	51	91	142 (100%)

4.1 Feasibility Validation

To determine the suitability of constructing a Structural Equation Model (SEM) to describe the causal relationships between the variables collected in this study, we first examined the measurement variables for their intercorrelations and their ability to reflect the underlying constructs accurately (Abusaada & Elshater, 2021). Based on the results collected from the questionnaire survey, this study conducted a comprehensive analysis using SAS 9.4 statistical software (Azagra-Caro & Consoli, 2016; Olwig, 2011). The analysis involved examining the Pearson correlation coefficients between the measured variables, measuring the linear relationship between two continuous variables, and calculating the mean and standard deviation for each variable, as shown in <Table 4>. The purpose of this step was to assess the degree to which the measurement scales accurately reflect the constructs proposed in the survey (Adler & Tanner, 2013).

Table 4: Pearson Correlation Analysis of Path Model (*N*=142)

Factor	Variable	1	2	3	4	5	M±SD
		R(P)	R(P)	R(P)	R(P)	R(P)	
CO	Ansan	1.00					3.69±.97
	Seoul	1.00					3.71±1.04
	Incheon	1.00					3.99±.84
SO	Ansan	.390(<.001)	1.00				3.46±1.04
	Seoul	.536(<.001)	1.00				3.66±1.03
	Incheon	.372(<.001)	1.00				3.72±.98
AE	Ansan	.508(<.001)	.276 (.001)	1.00			3.30±1.11
	Seoul	.397(<.001)	.360(<.001)	1.00			3.35±1.09
	Incheon	.472(<.001)	.438(<.001)	1.00			3.96±.96
SY	Ansan	.393(<.001)	.372(<.001)	.645(<.001)	1.00		3.44±1.04
	Seoul	.438(<.001)	.468(<.001)	.571(<.001)	1.00		3.35±.95
	Incheon	.315(<.001)	.501 (<.001)	.515(<.001)	1.00		3.99±.83
TR	Ansan	.398(<.001)	.428(<.001)	.636(<.001)	.613(<.001)	1.00	3.33±1.10
	Seoul	.471(<.001)	.479(<.001)	.572(<.001)	.643(<.001)	1.00	3.47±.99
	Incheon	.367(<.001)	.532(<.001)	.385(<.001)	.488(<.001)	1.00	3.92±.89

Note: All correlation coefficients are significant, $p < 0.001$.

The analysis results indicate that all five latent variables are positively correlated with the three streets under study. Specifically:

1. Ansan Multicultural Special Zone: The strongest and statistically significant positive correlation was found between "Aesthetic" and "Symbolism" (r = 0.645**).
2. Seoul Garibong Central Market: A significant and statistically significant positive correlation was observed

3. between "Symbolism" and "Trendiness" (r = 0.643**).
4. Incheon Chinatown: The most notable and statistically significant positive correlation was between "Sociability" and "Trendiness" (r = 0.532**). These findings show that the measured latent variables are interrelated, meeting the requirements for data analysis in path analysis.

4.2 Model Validation

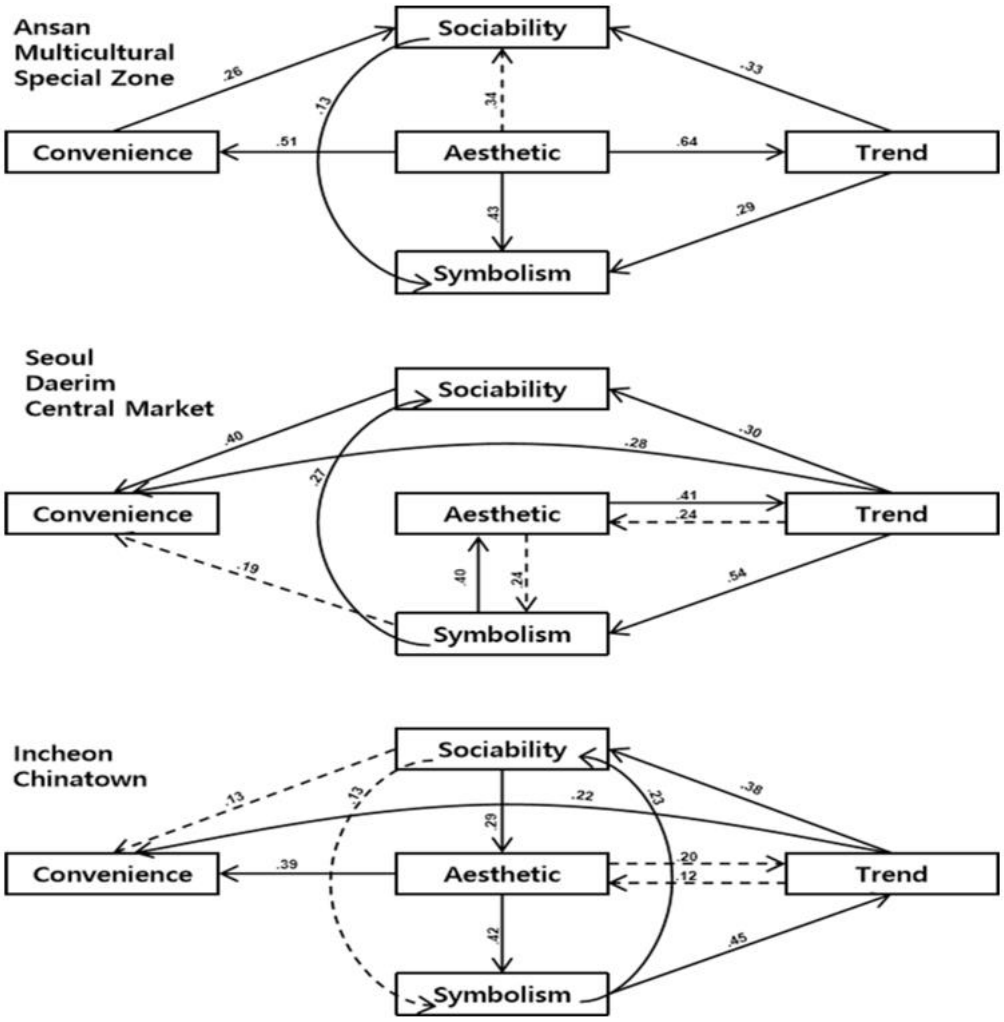

Figure 2: Research Model

Path analysis models are instrumental in examining the causal relationships between domestic and international tourists and the three multicultural commercial streets (Park & Garcia, 2020; Williamson et al., 2022) These models elucidate the linear relationships (directionality among variables) and path coefficients (priorities) among the five variables in these commercial streets (Osanai & Yu, 2023). To compare the influence paths of the five variables across the three multicultural regions, the path models' characteristics and validity were examined using SAS 9.4 statistical

software. The path analysis for each of the three multicultural areas was conducted, and the path estimates were calculated, as shown in Figure-2. The fit indices for the path analysis models are as follows:

4.2.1 Ansan Multicultural Special Zone

$\chi^2(p) = 3.23$ ($p = .357$)
$\chi^2/df = 3$
GFI = 1 (> .90)
AGFI = .95 (> .90)
CFI = 1.00 (> .90)
SRMR = .03
RMSEA = .02
RMSEA LL = .00
RMSEA UL = .15

4.2.2 Seoul Garibong Central Market

Fit Indices:

$\chi^2(p) = 4.05$ ($p = .256$)
$\chi^2/df = 3$
GFI = 1 (> .90)
AGFI = .99 (> .90)
CFI = 1.00 (> .90)
SRMR = .03
RMSEA = .05
RMSEA LL = .00
RMSEA UL = .15

4.2.3 Incheon Chinatown

Fit Indices:

$\chi^2(p) = 3.52$ ($p = .318$)
$\chi^2/df = 3$
GFI = .99 (> .90)
AGFI = .95 (> .90)
CFI = 1.00 (> .90)
SRMR = .03
RMSEA = .03
RMSEA LL = .00
RMSEA UL = .15

These results indicate that the causal relationships among variables in all

three models achieve a satisfactory level.

4.2.4 Path model analysis for Ansan Multicultural Special Zone

Table 5: Path Model of Ansan Multicultural Special Zone (N=142)

Path Effect	Beta	β	S.E.	T	P
Convenience < Aesthetic	.444	.508	.063	8.133	<.001
Sociability < Convenience	.279	.262	.076	3.458	.001
Sociability < Trendiness	.306	.326	.075	4.375	<.001
Symbolism < Sociability	.130	.131	.065	1.988	.047
Symbolism< Aesthetic	.398	.425	.074	5.746	<.001
Symbolism < Trendiness	.270	.285	.079	3.630	.000
Trendiness < Aesthetic	.629	.636	.050	12.689	<.001

In the path model analysis for the Ansan Multicultural Special Zone (see Table 6), several significant positive influences among the variables were observed:

1. Influence of Aesthetic on Convenience (CO←AE):
- Path Coefficient (β) = 0.508, p < 0.001
- t-value = 8.133
- This indicates a highly significant positive effect of Aesthetic on Convenience.

2. Influence of Convenience on Sociability (SO←CO):
- Path Coefficient (β) = 0.262, p = 0.001
- t-value = 3.458
- This indicates a significant positive effect of Convenience on Sociability.

3. Influence of Trendiness on Sociability (SO←TR):
- Path Coefficient (β) = 0.326, p < 0.001
- t-value = 4.375
- This indicates a significant positive effect of Trendiness on Sociability.

4. Influence of Sociability on Symbolism (SY←SO):
- Path Coefficient (β) = 0.131, p = 0.047
- t-value = 1.988
- This indicates a significant positive effect of Sociability on Symbolism.

5. Influence of Aesthetic on Symbolism (SY←AE):
- Path Coefficient (β) = 0.425, p < 0.001
- t-value = 5.746

- This indicates a highly significant positive effect of Aesthetic on Symbolism.

6. Influence of Trendiness on Symbolism (SY←TR):

- Path Coefficient (β) = 0.285, p = 0.000
- t-value = 3.630
- This indicates a significant positive effect of Trendiness on Symbolism.

7. Influence of Aesthetic on Trendiness (TR←AE):

- Path Coefficient (β) = 0.636, p < 0.001
- t-value = 12.689
- This indicates a highly significant positive effect of Aesthetic on Trendiness.

4.2.5 Path model analysis for the Seoul Garibong Central Market

Table 7: Path Model of Seoul Daerim Central Market (*N*=142)

Path Effect	**Beta**	**β**	**S.E.**	**T**	**P**
Convenience < Sociability	.407	.402	.073	5.514	<.001
Convenience < Trendiness	.294	.278	.076	3.684	.000
Sociability < Symbolism	.295	.273	.092	2.975	.003
Sociability < Trendiness	.316	.303	.091	3.314	.001
Aesthetic< Symbolism	.459	.403	.079	5.127	<.001
Symbolism < Trendiness	.518	.536	.062	8.636	<.001
Trendiness < Aesthetic	.368	.405	.078	5.171	<.001

In the path model analysis for the Seoul Garibong Central Market (see Table 7), several significant positive influences among the variables were observed:

1. Influence of Sociability on Convenience (CO←SO):

Path Coefficient (β) = 0.402, p < 0.00

t-value = 5.

This indicates a highly significant positive effect of Sociability on Convenience

2. Influence of Trendiness on Convenience (CO←TR):

Path Coefficient (β) = 0. 278, p = 0.001

t-value = 3.684

This indicates a significant positive effect of Trendiness on Convenience.

3. Influence of Symbolism on Sociability (SO←SY):

Path Coefficient (β) = 0.273, p = 0.003

t-value = 2.975

This indicates a significant positive effect of Symbolism on Sociability.

4. Influence of Trendiness on Sociability (SO←TR):
Path Coefficient (β) = 0.303, p = 0.001
t-value = 3.314
This indicates a significant positive effect of Trendiness on Sociability.
5. Influence of Symbolism on Aesthetic (AE←SY):
Path Coefficient (β) = 0.403, p < 0.001
t-value = 5.127
This indicates a highly significant positive effect of Symbolism on Aesthetic.
6. Influence of Trendiness on Symbolism (SY←TR):
Path Coefficient (β) = 0.536, p < 0.001
t-value = 8.636
This indicates a highly significant positive effect of Trendiness on Symbolism.
7. Influence of Aesthetic on Trendiness (TR←AE):
Path Coefficient (β) = 0.405, p < 0.001
t-value = 5.171
This indicates a highly significant positive effect of Aesthetic on Trendiness.

4.2.6 Path Model Analysis for Incheon Chinatown

Table 8(a): Path Model of Incheon Chinatown (*N*=142)

Path Effect	**Beta**	**β**	**S.E.**	**t**	**p**
Convenience < Aesthetic	.339	.390	.072	5.444	<.001
Convenience < Trendiness	.205	.219	.075	2.902	.004
Sociability < Symbolism	.275	.232	.082	2.831	.005
Sociability < Trendiness	.421	.382	.074	5.143	<.001
Aesthetic < Sociability	.282	.289	.085	3.387	.001
Symbolism < Aesthetic	.365	.423	.073	5.829	<.001
Trendiness < Symbolism	.485	.451	.067	6.693	<.001

In the path model analysis for Incheon Chinatown (see Table 8), several significant positive influences among the variables were observed:
1. Influence of Aesthetic on Convenience (CO←AE):
Path Coefficient (β) = 0.390, p < 0.001
t-value = 5.444
This indicates a highly significant positive effect of Aesthetic on Convenience.
2. Influence of Trendiness on Convenience (CO←TR):
Path Coefficient (β) = 0.219, p = 0.004
t-value = 2.902

This indicates a significant positive effect of Trendiness on Convenience.

3. Influence of Symbolism on Sociability (SO←SY):

Path Coefficient (β) = 0.232, p = 0.005

t-value = 2.831

This indicates a significant positive effect of Symbolism on Sociability.

4. Influence of Trendiness on Sociability (SO←TR):

Path Coefficient (β) = 0.382, p < 0.001

t-value = 5.143

This indicates a significant positive effect of Trendiness on Sociability.

5. Influence of Sociability on Aesthetic (AE←SO):

Path Coefficient (β) = 0.289, p = 0.001

t-value = 3.387

This indicates a significant positive effect of Sociability on Aesthetic.

6. Influence of Aesthetic on Symbolism (SY←AE):

Path Coefficient (β) = 0.423, p < 0.001

t-value = 5.829

This indicates a highly significant positive effect of Aesthetic on Symbolism.

7. Influence of Symbolism on Trendiness (TR←SY):

Path Coefficient (β) = 0.451, p < 0.001

t-value = 6.683

This indicates a highly significant positive effect of Symbolism on Trendiness.

4.3 The Virtual Variable Model Analysis

Table 9: (a) Significance Test of Direct Effect and Indirect Effect (*N*=142)

Model	**Variables**	**Categories**	**Direct Effect(p)**	**Indirect Effect(p)**	**Total Effect(p)**	**R^2**
Ansan	SO	CO	.262(.001)		.262(.001)	.231
		TR	.326(<.001)		.326(<.001)	
		CO < AE		.340(<.001)	.340(<.001)	
		TR < AE				
	CO	AE	.508(<.001)		.508(<.001)	.258
	TR	AE	.636(<.001)		.636(<.001)	.405
	SY	SO	.130(.047)		.130(.047)	.502
		AE	.425(<.001)		.425(<.001)	
		TR	.285(.000)		.285(.000)	
Seoul	SO	SY	.273(.003)		.273(.003)	.273

Table 9: (b) Significance Test of Direct Effect and Indirect Effect (*N*=142)

Model	Variables	Categories	Direct Effect(p)	Indirect Effect(p)	Total Effect(p)	R^2
		TR	.303(.001)		.303(.001)	
	AE	SY	.403(<.001)		.403(<.001)	.298
		SY < TR		.237(<.001)	.237(<.001)	
	TR	AE	.405(<.001)		.405(<.001)	.299
	CO	SO	.402(<.001)		.402(<.001)	.347
		TR	.278(.000)		.278(.000)	
		SO < SY		.192(<.001)	.192(<.001)	
	SY	TR	.536(<.001)		.536(<.001)	.402
		TR < AE		.238(<.001)	.238(<.001)	
In Cheon	AE	SO	.289(.001)		.289(.001)	.170
		SO < TR		.116(.007)	.116(.007)	
	TR	SY	.451(<.001)		.451(<.001)	.237
		SY < AE		.201(<.001)	.201(<.001)	
	CO	AE	.390(<.001)		.390(<.001)	.255
		TR	.219(.004)		.219(.004)	
		AE < SO		.131(.004)	.131(.004)	
	SY	AE	.423(<.001)		.423(<.001)	.257
		AE < SO		.129(.001)	.129(.001)	
	SO	SY	.232(.005)		.232(.005)	.353
		TR	.382(<.001)		.382(<.001)	

Using a virtual variable model in path analysis effectively handles categorical variables, enhancing the explanatory and predictive power of the model, thereby making the research findings more comprehensive and in-depth (Boyle, 1970; Garson, 2013; Lleras, 2005; Zaremohzzabieh et al., 2021). The results of the virtual variable model analysis are as follows (see Table 9):

1. Ansan Multicultural Special Zone

a. Indirect Influence of Aesthetic on Sociability through Convenience: Significant ($p < 0.001$)

b. Indirect Influence of Aesthetic on Sociability through Trendiness: Significant ($p < 0.001$)

In the final Structural Equation Model (SEM) for the Ansan Multicultural Special Zone:

- Symbolism is a significant variable with both direct and indirect

effects, explaining 50.2% of the variance.

- Trendiness is also a significant variable with both direct and indirect effects, explaining 40.5% of the variance.
- Convenience explains 25.8% of the variance.
- Sociability explains 23.1% of the variance.

2. Seoul Garibong Central Market

a. Indirect Influence of Trendiness on Aesthetic through Symbolism: Significant ($p < 0.001$)

b. Indirect Influence of Symbolism on Convenience through Sociability: Significant ($p < 0.001$)

Indirect Influence of Aesthetic on Symbolism through Trendiness:

c. Significant ($p < 0.001$)

In the final SEM for the Seoul Garibong Central Market:

- Symbolism is a significant variable with both direct and indirect effects, explaining 40.2% of the variance.
- Convenience is also a significant variable with both direct and indirect effects, explaining 34.7% of the variance.
- Trendiness explains 29.9% of the variance.
- Aesthetic explains 29.8% of the variance.
- Sociability explains 27.3% of the variance.

3. Incheon Chinatown

a. Indirect Influence of Trendiness on Aesthetic through Sociability: Significant ($p = 0.007$)

b. Indirect Influence of Aesthetic on Trendiness through Symbolism: Significant ($p < 0.001$)

c. Indirect Influence of Sociability on Convenience through Aesthetic: Significant ($p = 0.004$)

d. Indirect Influence of Sociability on Symbolism through Aesthetic: Significant ($p = 0.001$)

In the final SEM for Incheon Chinatown:

- Sociability is a significant variable with both direct and indirect effects, explaining 35.3% of the variance.
- Symbolism is also a significant variable with both direct and indirect effects, explaining 25.7% of the variance.
- Convenience explains 25.5% of the variance.
- Trendiness explains 23.7% of the variance.
- Aesthetic explains 17% of the variance.

4.4 Analysis Feedback Results

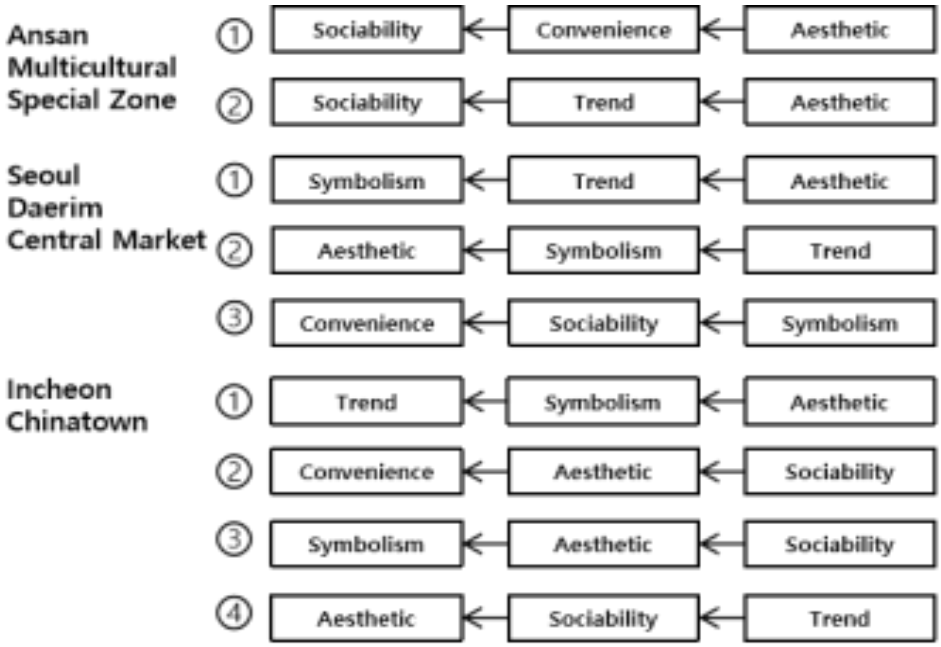

Figure 4: Analysis Results of Three Multicultural Regional Paths Feedback

The path analysis results for the three multicultural areas are illustrated in Figure 4, highlighting the key factors influencing sociability in each location.

1. Ansan Multicultural Special Zone Key Influencing Factors:

- Aesthetic: Exhibits the strongest influence on sociability, indicating its pivotal role in enhancing social interactions within the area.
- Convenience and Trendiness: These factors influence sociability indirectly through aesthetic, demonstrating a mediated relationship.
- Overall Influence: Aesthetic, convenience, and trendiness show strong positive correlations with sociability, suggesting a highly interlinked relationship.

2. Seoul Garibong Central Market Key Influencing Factors:

- Symbolism: The most direct and influential factor affecting the overall results. It is positively correlated with aesthetic, convenience, trendiness, and sociability.
- Interconnected Factors: Symbolism has the highest degree of interaction with other design elements, underscoring its central role in the market's design dynamics.

3. Incheon Chinatown Key Influencing Factors:

- Trendiness: The most direct factor impacting the overall effect, highlighting its significant role in the area's vibrancy.
- Interconnected Factors: Aesthetic, convenience, and sociability all

positively correlate with trendiness, indicating that trendiness interacts most prominently with these elements.

- Overall Influence: Trendiness's interaction with other design factors is the most pronounced, making it a crucial element in the design and appeal of Incheon Chinatown.

This study conducted path analyses on three different multicultural areas: Ansan Multicultural District, Seoul Daerim Central Market, and Incheon Chinatown. It provides profound insights into how various design factors interact and influence the integration and development of multicultural environments (Malek et al., 2012; Mouratidis & Poortinga, 2020). In the path model for the Ansan Multicultural District, factors of "aesthetic appeal," "convenience," and "trendiness" show a strong positive correlation with the overall impact on "sociability," indicating an interrelation among them. However, "convenience" and "trendiness" mainly influence "sociability" through "aesthetic appeal." Currently, "aesthetic appeal" has the greatest impact on the Ansan Multicultural District, suggesting that the design focus should be on enhancing aesthetic appeal to indirectly boost sociability (Koehler & Yoon, 2019). In the path analysis of the Seoul Daerim Central Market, the most direct factor affecting the overall results is "symbolism." This includes "aesthetic appeal," "convenience," "trendiness," and "sociability," all of which are positively correlated with "symbolism." This indicates that "symbolism" has the highest level of interaction with other design elements in the market, making it a key factor in influencing the design effectiveness of the Seoul Daerim Central Market.

The design focus should be on enhancing symbolism to improve the market's unique image and brand recognition. The path model for Incheon Chinatown shows a unique interaction where "symbolism" is directly influenced by "aesthetic appeal," and "aesthetic appeal" in turn affects "trendiness." Additionally, "sociability" indirectly influences "trendiness" through "aesthetic appeal." This pattern indicates a significant interrelation between "trendiness" and other design factors, highlighting the importance of "trendiness" in the multicultural context of Incheon Chinatown. Enhancing trendiness, creating viral hotspots, and distinctive districts are effective strategies to increase the area's attractiveness. Interestingly, a similar pattern was observed in the central market of Seoul, where "trendiness" is influenced by "aesthetic appeal," which affects "symbolism," indicating that the dynamics of urban design in these multicultural areas share commonalities.

5. CONCLUSION

With the continuous flow of diverse populations, urban development faces increasing multicultural challenges. This study aims to bridge the gap in design research related to multicultural urban development by examining the current design and development needs of the Ansan Multicultural District and providing insights through comparative analysis with two other successful multicultural areas. Enhancing the aesthetic quality of architecture is considered an urgent development need for the Ansan Multicultural District, although this should be gradually achieved through long-term planning. In contrast, Seoul Daerim Central Market and Incheon Chinatown exhibit cyclical and interdependent influence paths among the five design factors, with "symbolism" and "trendiness" playing crucial roles. This finding lays the foundation for the synergistic development of multicultural design factors. The design proposals of this study are as follows: The future development strategy for the Ansan Multicultural District should closely follow popular trends. Collaborating with local popular brands or celebrities and promoting on social media can effectively enhance the market's online visibility, indirectly boosting consumers' perception of convenience in the area through trendy elements. Improvements can also be made by integrating symbolic architecture with aesthetic trends and developing promotional activities on social networks. Additionally, a simplified navigation system, such as clear signage, maps, and mobile navigation apps, can help customers easily find products or services of interest. Considering the diverse needs of customers from various countries, extending business hours or providing 24-hour services could also be an effective way to enhance convenience and meet customer demands. This study has limitations in evaluating the current status and impact of the Ansan Multicultural District. The diversity of the research sample is limited by the number of individuals from different countries and regions. Furthermore, data collection heavily relies on questionnaires and observations, which may introduce subjective biases. Lastly, given the dynamic nature of culture, this study may only provide a temporary snapshot of multicultural conditions. Future research should aim to involve a broader sample and regions to ensure that design and policy analyses are based on comprehensive data.

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