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People, Places, and Perceptions: Assessing Spatial Quality Attributes of Urban Third-place With Projective Survey

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ABSTRACT

Urban third places, such as cafes, parks, and plazas, are integral to the social fabric of urban environments, providing spaces for informal social interaction outside of home and work. This study explores the spatial quality attributes that define these third places and their influence on user perceptions and experiences. By employing a projective survey, a qualitative research method utilizing ambiguous stimuli to reveal deeper user sentiments, the research identifies key characteristics that contribute to the desirability of these spaces. Findings highlight the significance of physical, functional, and social dimensions, including furniture design, spatial layout, and opportunities for social interaction. These attributes are shown to vary significantly across different age groups, with notable differences in preferences between younger and older participants. The study's insights inform urban designers and architects on creating inclusive, vibrant third places that enhance urban livability and economic vitality. The research underscores the need for a human-centric approach in urban design, emphasizing the importance of accommodating diverse user needs and preferences to foster a sense of community and well-being in urban settings. By understanding the nuanced relationships between spatial attributes and user perceptions, the study contributes to the development of more effective urban design strategies.

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Highlights:

The research demonstrates how spatial quality attributes of urban third places contribute to the enhancement of social-economic dynamics in the urban environment.
- The study identifies and analyses critical spatial quality attributes that enhance the overall quality of an urban third place.
- The use of projective surveys in assessing the spatial quality attributes of urban third places represents a novel methodological contribution to urban studies, offering a complementary approach to traditional quantitative methods.

Contribution to the field statement:

The research contributes by establishing the significance of these characteristics in the formation of an urban third place. It also informs urban designers and architects in practice by identifying the key attributes that create more inclusive and vibrant urban environments influencing the urban economy as well.

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1. Introduction

Urbanization has rapidly transformed communities, resulting in numerous socio-cultural and urban changes. In many cities, this growth has led to social isolation, privatization, and a competitive lifestyle that often undermines a sense of community. Yet, a healthy community life with social inclusion remains an enduring expectation and has now become a desperate need. This need calls for spaces that offer opportunities for people to gather informally and enjoyably, connecting them as part of a broader community.

In 1989, urban sociologist Ray Oldenburg introduced the concept of the "third place," a setting distinct from the home and workplace that provides a refuge from both. As Oldenburg (1999) elaborates, these third places are informal urban gathering spots that foster inclusive sociability, where conversation is the primary activity and a key means of expressing individuality. These environments are essential for offering people the chance to relax, connect, and converse.

Despite the conveniences of modern life, the value of community remains paramount, particularly in developing countries like India, where community hubs are crucial for societal well-being. Gupta and Law (2023) point out that cities, despite being the primary economic engines of modern civilization, often become uninhabitable due to a lack of consideration for human psychology. This is especially true in India, where urban design frequently neglects human-scale considerations, emphasizing an interdependent relationship between human behaviour and the environment. Understanding this interaction is vital for attracting people to urban public places, as highlighted by Mehta and Bosson (2010). Research and implementation in India have primarily focused on urban planning at the city and neighbourhood levels, but a significant gap remains in comprehending the urban third place from a human-centric perspective. This study seeks to illuminate user perceptions and experiences of these spaces, offering insights that urban designers can utilize to enhance the urban economy.

Urban design and planning at various scales enable the identification of spatial quality attributes. At the city level, an extensive strategy is necessary to analyze spatial qualities, focusing on infrastructure configuration, road systems, and interconnectedness. Neighborhood-level studies emphasize street appearances, building and public space design, and mixed land use. However, the most critical yet often overlooked scale is the human-centric perspective, which is essential for understanding the connection between people and places.

Jan Gehl (2010) notes a wealth of knowledge and expertise at the city and neighbourhood levels, but the human dimension remains understudied. Policymakers and urban designers often lack the necessary attention and sensitivity to this scale. Examining spatial quality attributes from the human dimension is crucial, as they reflect people's perceptions of the urban third place and enhance its design. Gehl asserts that sensory experiences of urban environments are intricately linked to human senses and the proportions and scale of the surroundings. Assessing the spatial quality attributes of third places involves considering characteristics that contribute to their appeal, functionality, and experiential quality, shaping users' perceptions, interactions, and overall experience.

Traditionally, urban environments are perceived visually, limiting spatial understanding of third places. However, true comprehension extends beyond the visual, requiring a combination of non-visual senses for a holistic experience. Madanipour and Madani (1996) argue that limiting understanding to visual perception focuses solely on forms. A deeper exploration reveals space as a three-dimensional experience, encouraging interaction rather than mere observation. This principle applies to spatial design, where creating functional spaces for diverse purposes is paramount. Recognizing that design involves demonstrating ideas for spatial transformation, as Madanipour and Madani (1996) suggest, enhances the spatial experience of third places.

To identify spatial quality attributes of urban third places from a human perspective, we must analyze the environment at eye level, considering design elements like spatial planning, scale, proportion, distances, accessibility, sensory aspects, and human activities. The spatial layout of a third place is among the most significant attributes. The relationship between people and places necessitates

illustrating the physical condition of these spaces. According to Lukito and Xenia (2018), observing individuals' actions and emotions toward places and correlating these observations with environmental characteristics is crucial for understanding their significance.

In his book "Cities for People," Jan Gehl asserts that the spatial layout significantly influences potential utilization. Furniture orientation, design, and arrangement reinforce spatial planning, encouraging longer stays and various forms of interaction. Gallacher (2005) supports this view, emphasizing that urban public areas thrive with diverse purposes, offering activities like formal and informal interactions, leisure pursuits, and social engagement. These activities naturally inspire others to join, creating a vibrant social platform. Safety and security are also significant spatial attributes, as individuals tend to congregate in areas occupied by others, seeking protection (Felson, 1998).

An urban environment rich in visual and auditory experiences captivates individuals. Observing people pass by without cost is a primary urban attraction. According to Gehl (2010), the greatest source of joy is another human being, underscoring the importance of social interaction and engagement through sensory experiences. Places with activities and spontaneous encounters naturally attract people, reflecting the human tendency toward socialization and connection. Social activities require others' presence in public areas (Hajialiakbari et al., 2021). Convenient access is another crucial characteristic of a successful urban third place, encompassing both physical and visual accessibility. Physical access is defined by proximity and convenience, while visual accessibility enhances the spatial character of urban life, blurring boundaries between built and natural environments. Pedestrian-friendly places like pavement cafes and sidewalks epitomize urbanity at its best. Tarek et al. (2021) state that the absence of transition zones hinders pedestrian experiences and affects overall spatial quality.

Temporality is a unique attribute that enhances third-place appeal. Carmona (2021) suggests that diverse activities stimulate unpredictability and spur spontaneous acts, fostering sociability and festivity. Recognizing temporality in third places embraces their ever-changing nature, contributing to vibrancy and desirability. Third places take many forms, but the individuals and entertainment they offer drive enjoyment (Yuen & Johnson, 2017).

In conclusion, this study aims to explore the critical spatial quality attributes of urban third places and how these impact people's experiences of urban environments. While we've examined these attributes from an urban studies perspective, it is equally important to investigate the perceptions of those who use these places. As Jeffres et al. (2009) note, there is a gap in scholarly contributions that consider the public's perspective and the influence of third places on the quality of life. By actively engaging with communities and prioritizing inclusivity in design, urban planners and designers can create spaces that truly serve the diverse needs of all users. This research seeks to provide insights that urban designers can implement to enhance urban third places, ultimately fostering community well-being, encouraging social interaction, and enriching the urban experience.

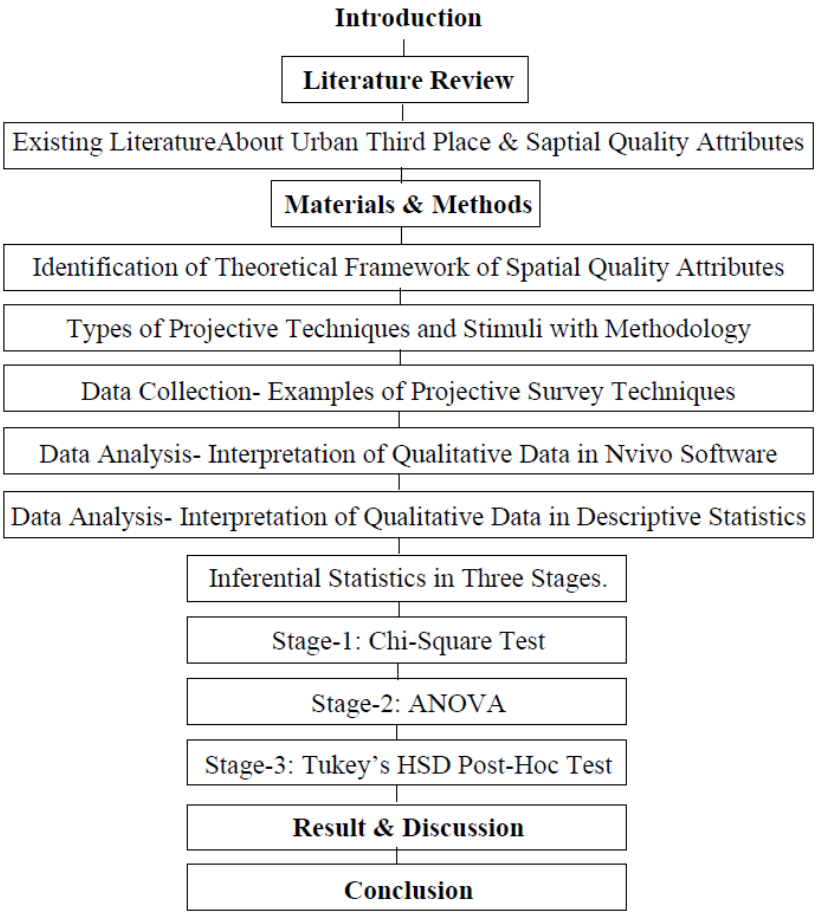

Figure 1. Conceptual Model of the Study.

2. Materials and Methods

2.1 Study Design and Setting

The theoretical framework for spatial quality attributes provides a conceptual basis for understanding and evaluating the characteristics that define a physical place's quality. It provides a comprehensive understanding of what defines a desirable urban third place and how different factors contribute to its overall spatial quality. We employ this framework to categorize the attributes and facilitate statistical analysis. As previously mentioned, we conduct the research at the human scale of urban design, which aids in maintaining a focused scope. Carmona (2021) asserts that examining all dimensions simultaneously makes urban design holistic. To support this approach, he classifies dimensions of urban design into six categories: physical, perceptual, social, visual, functional, and temporal, with an awareness that these characteristics may overlap, reflecting the experiences of everyday urban life. He explicitly acknowledges that this separation is simply for clarity in exposition and analysis.

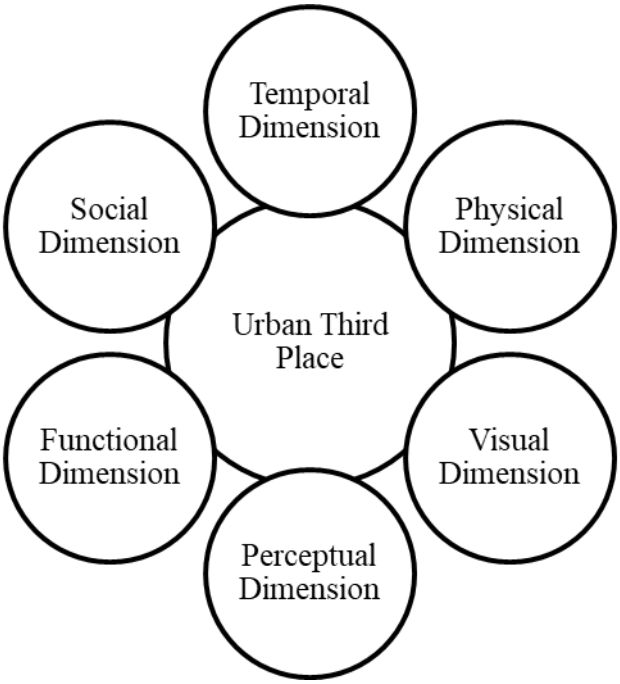

Figure 2. Theoretical Framework of Urban Third Place.

2.2 Participants or Subjects

We distributed a survey to a total of 80 participants because this research is part of a pilot study at its early stage, which aims to explore the initial insights of respondents rather than generalize findings to a larger population. Given the nature of qualitative research, we anticipate that a sample size of 80 will suffice to achieve a data saturation point, beyond which further data collection yields no new insights. We divide the sample size into four age groups. Each age group has 20 participants, with 10 males and 10 females, ensuring equal representation in all groups. Thus, within a sample population, while four groups as a whole represent multiplicity, every group represents its homogeneity. Qualitative analysis is generally concerned with enhancing understanding of the world in all its diversity (Ragin, 1992).

2.3 Materials and Equipment

This study conducts a systematic literature review to investigate the fundamental concepts, theories, and views of different researchers that are essential to the research inquiry. This helps to provide background information and justification for the research question under investigation The literature review sub-categorizes the identified dimensions of urban third place into spatial quality attributes, as mentioned in Figure 2, which require analysis.

Table 1: Spatial Quality Attributes.

Physical Dimension Spatial Layout Furniture Design, Arrangement & Orientation Well-prioptionate Transition Zones Easy accessibility with shorter distance	**Visual Dimension** Visual accessibility between inside & outside Physical planning at human scale	**Perceptual Dimension** Sense of comfort & security Sensory experience of well-being
Functional Dimension Opportunity for seeing, hearing & talking Pedestrian & age-friendly Variety of mixed urban activities	**Social Dimension** Opportunity for self-expression & identity Platform for social interaction & engagement Sense of community	**Temporal Dimension** Adaptability towards changing built environment Opportunity for sociability & festivity

The study, which aims to investigate users' perceptions of the third place, adopts an exploratory and qualitative approach. A regular quantitative survey involves direct questioning. This technique may not be appropriate for eliciting honest and complete responses. As a result, the adoption of the projective technique is based on the notion that when individuals encounter a vague or poorly structured stimulus, their underlying desires and emotions may manifest. As Spry & Pitch (2020) claim, projective techniques serve as a complement to conventional techniques for eliciting diverse interpretations from users. This approach allows respondents to express themselves beyond their rational thinking, providing a researcher with perceptions of more spontaneous individuals. Projective approaches are divided into three categories: association, completion, and construction, based on the types of responses required (Hofstede et al., 2007). The particular objective of the research guides the selection and application of these techniques during the data collection process.

Table 2: Types of Projective Techniques & Stimuli with Methodology.

Sr. No.	Projective Technique	Type of Projective Technique	Type of Stimulus	Methodology
1	Association	Word Association	Verbal	In order to elicit the initial word that comes to the participants' minds, a stimulus is delivered in the form of a word, sentence, or photograph. (Eldesouky et al., 2015)
		Photo Association	Verbal-Visual	
		Brand Personification	Verbal	Participants are directed to attribute personality to brands and envision them as human beings or individuals. The objective is to extract factual information as well as symbolic imagery linked to the organisations. (Mesías & Escribano, 2018)
		Photo-Sort Technique	Verbal-Visual	This approach entails presenting a series of photos to participants and instructing them to classify them according to their preferences. (Mesías & Escribano, 2018)
2	Completion	Sentence Completion	Verbal	Participants are presented with incomplete phrases and prompted to fill in the missing

				parts with the initial word or phrase that comes to tmind in the sentence completion assignment. (Eldesouky et al., 2015)
		Story Completion	Verbal	Participants are provided with a specific segment of a narrative to focus on, and subsequently, they are prompted to generate their own summary. (Mesías & Escribano, 2018)
3	Construction	Bubble Drawing/ Cartoon Test	Verbal-Visual	Typically, the approach involves showcasing comical individuals in an ambiguous environment and engaging in a dialogue regarding the topic being examined. Test participants are required to complete the dialogue between the cartoon characters by filling in an empty speech bubble. (Rook, 1988)

2.4 Procedures and Protocols

We created the online survey using Google Docs (www.docs.google.com) to gather responses from individuals on physical, perceptual, social, visual, functional, and temporal dimensions. We classify cafes as urban third places and examine them using 10 qualitative questions, as exemplified below. We asked participants about their preferred motives for visiting cafes, their desired activities and experiences, and their connections with cafes.

Survey Questionnaire- Open Ended

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Q.5: The best thing to enjoy in cafes is……

Q.6: I usually visit the café to experience……...

Q.7: What do you think sets your favourite café apart from others you have visited? Do you feel personally attached to it?

Figure 3: Sentence Completion & Word Association Technique

Q.8: Relate the following words to either of the images given below.

Comfort, Accessibility, Lifestyle, Taste, Ambition, Second Home, Social Media, Experience, Ambiance, Work/ Study, Nostalgia, Community, Gatherings, Cheap, Modern, Privacy, Social Status

Q.9: Below are the four scenarios about Rohan. Write 2-3 keywords within the scenario you think reflect the relationship between Rohan and the café.

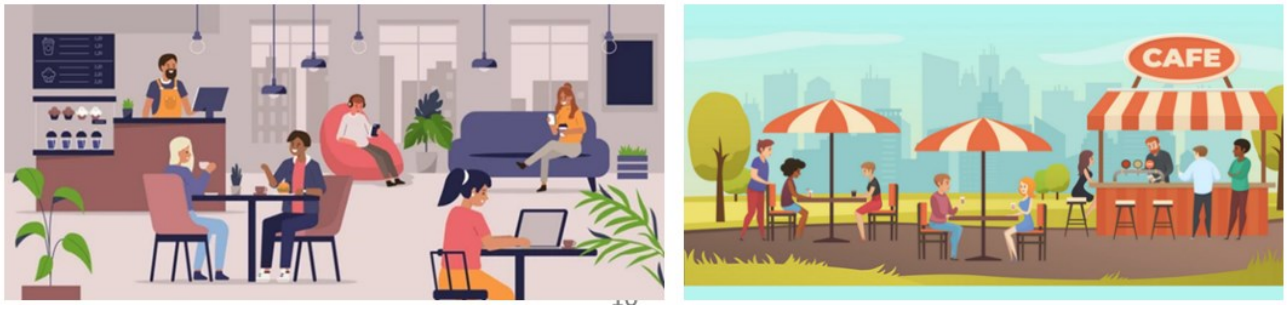


Figure 4. Photo Association Technique.

Scenario-1: Rohan was a busy entrepreneur, and he often found solace in the calmness of a cafe amidst his hectic schedule. He would bring his laptop and work from the cafe, enjoying the free Wi-Fi and the comfortable seating. Rohan liked to observe people coming and going, and he found inspiration in

the hustle and bustle of the cafe. He would order a latte and work for hours, finding it to be a productive and enjoyable environment to get things done.

Scenario 2: Rohan was an introvert and found solace in solitude. He loved to spend quiet moments at the cafe, sitting by the window and watching the world go by. He would order a pour-over coffee and immerse himself in a book or simply reflect on his thoughts. The cafe provided him with a peaceful retreat from the noise of the outside world, and he appreciated the calmness and serenity it offered. Rohan found comfort in the simple pleasure of enjoying his own company in the cosy ambience of the café.

Figure 5. Story Completion Technique

Q.4: In the scenario mentioned below, would you prefer spending time in a café?

1. Official/ Formal Meetings
2. Meeting Strangers
3. Informal Meetings
4. Working/ Studying Alone
5. Reunion with Old Friends
6. Improving Social Visibility
7. Enjoying Live Sports
8. Experience of Lifestyle

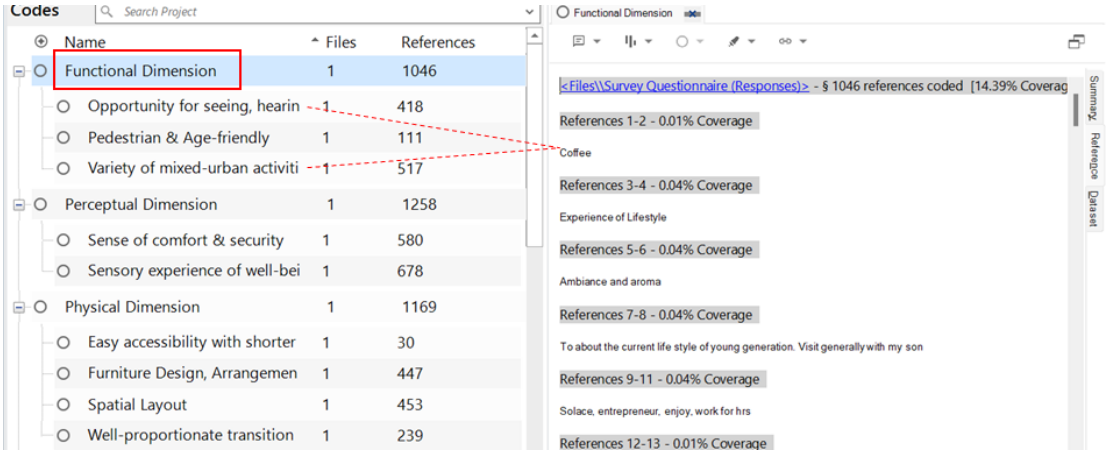
Figure 6. Photo-sort Technique.

2.5 Data Analysis

We conduct stratified random sampling by categorizing individuals into four age groups: Baby Boomers (56-75), Generation X (41–55), Generation Y (26–40), and Generation Z (11–25). Table 1 categorizes each person's responses into six dimensions, which we then record as a count. We use

Nvivo, a qualitative data documentation software, to document and organize the responses into a grouped frequency distribution table. An example of a functional dimension is shown in Figure 7. Step 1, where individual responses are sub-categorised in respective spatial quality attributes. In Step 2, with the help of Matrix Coding Query, all the responses for spatial quality attributes are allocated against every age group, as represented in Table 3.

Step:1



Step:2

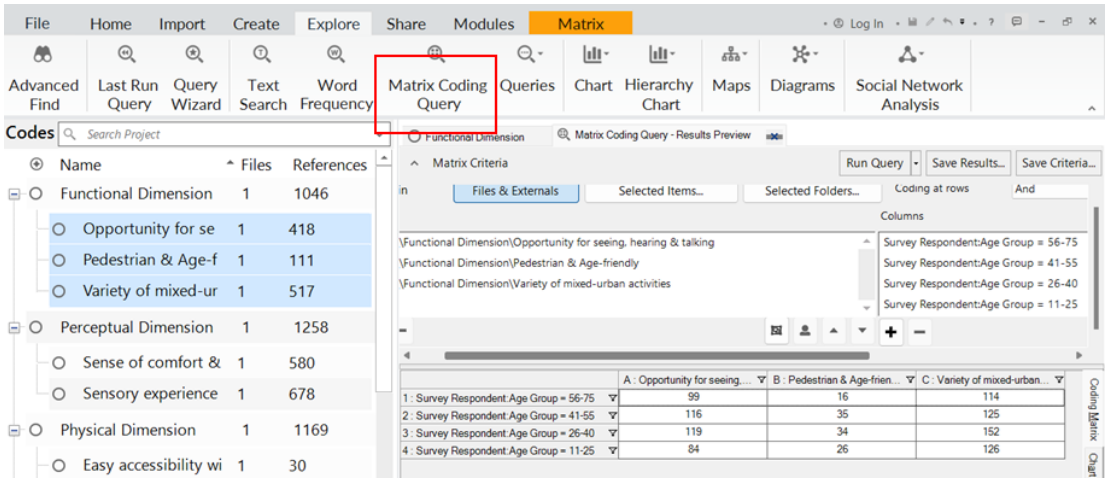


Figure 7. Categorization of Responses (Prepared in Nvivo Software-Developed by the Authors).

3. Results

3.1 Presentation of Key Findings

After organizing all the responses into descriptive statistics, we use inferential statistics in three stages to validate the projective technique results and guarantee the robustness of the findings.

Table 3: Grouped Frequency Distribution (Count of responses) .

	Spatial Attributes/ Age Group	(56-75)	(41-55)	(26-40)	(11-25)
Physical	Easy Accessibility with Shorter Distance	5	9	9	7
	Furniture Design, Arrangement & Orientation	100	102	133	112
	Spatial Layout	99	103	137	114
	Well- Poroportionate Transition Zones	53	69	64	53
Visual	Physical Planning at Human Scale	59	77	88	86
	Visual Accessibility Between Inside & Outside	56	73	74	65
Perceptual	Sense of Comfort & Security	134	127	175	144
	Sensory Experience of Well-Being	149	172	195	162
Functional	Opportunity for Seeing, Hearing & Talking	99	116	119	84
	Pedestrian & Age-Friendly	16	35	34	26
	Variety of Mixed Urban Activities	114	125	152	126
Social	Opportunity for Self-Expression & Idenity	44	46	54	60
	Platform for Social Interaction	116	136	148	109
	Sense of Community	65	71	61	52
Temporal	Adaptability Towards Changing Built Environment	96	89	110	104
	Opportunity for Sociability & Festivity	112	118	131	102

3.2 Statistical Analysis

Stage 1: To determine whether there is a statistically significant relationship between a particular age group and its perception of the spatial attributes of third place.

The chi-square test is an inferential, non-parametric statistical test that allows one to draw conclusions about a population based on a sample. Specifically, it determines the relationship between two variables within the population. It evaluates null and alternative hypotheses. In this study, the null Hypothesis (H0) is that there is no statistically significant relationship between a particular age group and its perception of the spatial attributes of third place. Alternative Hypothesis (H1): There is a statistically significant relationship between a particular age group and its perception of the spatial attributes of third place.

Chi-Square is defined by: $\chi^2 = \sum [\, O - E]2 \,/\, (E)$…..Where O- Observed Frequency & E- Expected Frequency

Degrees of Freedom (d.f) = n-1… Where n = No. of Items, Significance Level $(\alpha) = 0.05$

Table 4: Chi-Square Test between identified spatial attributes and age groups.

For Age Group (56-75)							
Sr. No.	**Dimension**	**Spatial Attributes**	**O**	**E**	**(O-E)**	**$(O-E)^2$**	**$(O-E)^2/E$**
1	Physical	Easy Accessibility with shorter distance	5	64.25	-59.25	3510.56	54.63
		Furniture Design, Arrangement & Orientation	100	64.25	35.75	1278.06	19.89
		Spatial Layout	99	64.25	34.75	1207.56	18.79
		Well-proportioned Transition Zones	53	64.25	-11.25	126.56	1.96
		$\sum (O-E)^2 / E$ = 95.27 > Critical value from distribution table= **7.815**					
2	Visual	Physical planning at human scale	59	57.5	1.5	2.25	0.03
		Visual accessibility between inside & outside	56	57.5	-1.5	2.25	0.03
		$\sum (O-E)^2 / E$ = 0.06 < Critical value from distribution table = **3.841**					
3	Perceptual	Sense of Comfort & Security	134	141.5	-7.5	56.25	0.39
		Sensory experience of well-being	149	141.5	7.5	56.25	0.39
		$\sum (O-E)^2 / E$ = 0.78 < Critical value from distribution table = **3.841**					

4	Functional	Opportunity for seeing, hearing & talking	99	76.33	22.67	513.92	6.73
		Pedestrian & Age-friendly	16	76.33	-60.33	3639.70	47.68
		Variety of mixed urban activities	114	76.33	37.67	1419.02	18.59
		$\sum (O-E)^2 / E = 73 >$ Critical value from distribution table = **5.991**					
5	Social	Opportunity for self-expression & identity	44	75	-31	961	12.81
		Platform for social interaction	116	75	41	1681	22.41
		Sense of Community	65	75	10	100	1.33
		$\sum (O-E)^2 / E = 36.28 >$ Critical value from distribution table = **5.991**					
6	Temporal	Adaptability towards changing built environment	96	104	-8	64	0.61
		Opportunity for Sociability & Festivity	112	104	8	64	0.61
		$\sum (O-E)^2 / E = 1.22 <$ Critical value from distribution table = **3.841**					
For Age Group (41-55)							
1	Physical	Easy Accessibility with shorter distance	9	70.75	-61.75	3813.06	53.89
		Furniture Design, Arrangement & Orientation	102	70.75	31.25	976.56	13.80
		Spatial Layout	103	70.75	32.25	1040.06	14.70
		Well-proportioned Transition Zones	69	70.75	-1.75	3.06	0.04
		$\sum (O-E)^2 / E = 82.43 >$ Critical value from distribution table = **7.815**					
2	Visual	Physical planning at human scale	77	75	2	4	0.05
		Visual accessibility between inside & outside	73	75	-2	4	0.05
		$\sum (O-E)^2 / E = 0.1 <$ Critical value from distribution table = **3.841**					
3	Perceptual	Sense of Comfort & Security	127	149.5	-22.5	506.25	3.38
		Sensory experience of well-being	172	149.5	22.5	506.25	3.38
		$\sum (O-E)^2 / E = 6.76 >$ Critical value from distribution table = **3.841**					
4	Functional	Opportunity for seeing, hearing & talking	116	92	24	576	6.26
		Pedestrian & Age-friendly	35	92	-57	3249	35.31
		Variety of mixed urban activities	125	92	33	1089	11.83
		$\sum (O-E)^2 / E = 53.4 >$ Critical value from distribution table = **5.991**					
5	Social	Opportunity for self-expression & identity	46	84.33	-38.33	1469.18	17.42
		Platform for social interaction	136	84.33	51.67	2669.78	31.65
		Sense of Community	71	84.33	13.33	177.68	2.10
		$\sum (O-E)^2 / E = 51.17 >$ Critical value from distribution table = **5.991**					
6	Temporal	Adaptability towards changing built environment	89	103.5	-14.5	210.25	2.03
		Opportunity for Sociability & Festivity	118	103.5	14.5	210.25	2.03
		$\sum (O-E)^2 / E = 4.06 >$ Critical value from distribution table = **3.841**					
For Age Group (26-40)							
1	Physical	Easy Accessibility with shorter distance	9	85.75	-76.75	5890.56	68.69
		Furniture Design, Arrangement & Orientation	133	85.75	47.25	2232.56	26.03

		Spatial Layout	137	85.75	51.25	2626.56	30.63
		Well-proportioned Transition Zones	64	85.75	-21.75	473.06	5.51
		$\sum (O-E)^2 / E$ =130.86 > Critical value from distribution table = **7.815**					
2	Visual	Physical planning at human scale	88	81	7	49	0.6
		Visual accessibility between inside & outside	74	81	-7	49	0.6
		$\sum (O-E)^2 / E$ = 1.2 < Critical value from distribution table = **3.841**					
3	Perceptual	Sense of Comfort & Security	175	185	-10	100	0.54
		Sensory experience of well-being	195	185	10	100	0.54
		$\sum (O-E)^2 / E$ = 1.08 < Critical value from distribution table = **3.841**					
4	Functional	Opportunity for seeing, hearing & talking	119	101.66	17.34	300.67	2.95
		Pedestrian & Age-friendly	34	101.66	-67.66	4577.87	45.03
		Variety of mixed urban activities	152	101.66	50.34	2534.11	24.92
		$\sum (O-E)^2 / E$ = 72.9 > Critical value from distribution table = **5.991**					
5	Social	Opportunity for self-expression & identity	54	87.66	-33.66	1132.99	12.92
		Platform for social interaction	148	87.66	60.34	3640.91	41.53
		Sense of Community	61	87.66	-26.66	710.75	8.10
		$\sum (O-E)^2 / E$ = 62.55 > Critical value from distribution table = **5.991**					
6	Temporal	Adaptability towards changing built environment	110	120.5	-10.5	110.25	0.91
		Opportunity for Sociability & Festivity	131	120.5	10.5	110.25	0.91
		$\sum (O-E)^2 / E$ = 1.82 < Critical value from distribution table = **3.841**					
For Age Group (11-25)							
1	Physical	Easy Accessibility with a shorter distance	7	71.5	-64.5	4160.25	58.18
		Furniture Design, Arrangement & Orientation	112	71.5	40.5	1640.25	22.94
		Spatial Layout	114	71.5	42.5	1806.25	25.26
		Well-proportioned Transition Zones	53	71.5	-18.5	342.25	4.78
		$\sum (O-E)^2 / E$ = 111.16 > Critical value from distribution table = **7.815**					
2	Visual	Physical planning at the human scale	86	75.5	10.5	110.25	1.46
		Visual accessibility between inside & outside	65	75.5	10.5	110.25	1.46
		$\sum (O-E)^2 / E$ = 2.92 < Critical value from distribution table = **3.841**					
3	Perceptual	Sense of Comfort & Security	144	153	-9	81	0.56
		Sensory experience of well-being	162	153	9	81	0.56
		$\sum (O-E)^2 / E$ = 1.12 < Critical value from distribution table = **3.841**					
4	Functional	Opportunity for seeing, hearing & talking	84	78.66	5.34	28.51	0.36
		Pedestrian & Age-friendly	26	78.66	52.66	2773.07	35.25
		Variety of mixed urban activities	126	78.66	47.34	2241.07	28.49
		$\sum (O-E)^2 / E$ = 64.1 > Critical value from distribution table = **5.991**					
5	Social	Opportunity for self-expression & identity	60	73.66	-13.66	186.59	2.53

		A platform for social interaction	109	73.66	35.34	1248.91	16.95
		Sense of Community	52	73.66	-21.66	469.15	6.36
		$\sum (O-E)^2 / E$ = 25.84 > Critical value from distribution table = **5.991**					
6	Temporal	Adaptability towards changing built environment	104	103	1	1	0.009
		Opportunity for Sociability & Festivity	102	103	-1	1	0.009
		$\sum (O-E)^2 / E$ = 0.018 < Critical value from distribution table = **3.841**					

We can derive inferences about the association between age and the responses of the sample population by comparing the chi-square value with the critical value from the chi-square distribution table. If the value of χ^2 is higher than the critical value from the distribution table, the association can be considered significant. In contrast, if the value of χ^2 is lower than the critical value, the association between the variables is considered to be insignificant. Table 4 shows that the physical, functional, and social characteristics are statistically significant across all age groups. The perceptual and temporal dimensions are only significant for the 41-55 age group. All age groups regard the visual dimension as insignificant.

Stage 2: To investigate the most prominent spatial attributes across all age groups in the sample population.

From Stage 1, we discovered that the physical, functional, and social characteristics are the most important for the sample population. We must use other traditional statistical tests to gain a deeper understanding of the association between age groups and responses, in order to support the findings of the chi-square test. ANOVA (Analysis of Variance) is a parametric statistical test that examines the difference in means between more than two groups. We use a one-way ANOVA to analyze the most common responses in the sample population, given that the obtained research data includes one independent variable (age group with four sub-groups) and a quantitative dependent variable (number of respondents). This analysis highlights the spatial attributes of the urban third place that are most desired by the participants. For this analysis, the null hypothesis is: (HO)- There are no preferred spatial attributes among the sample population. Alternative Hypothesis: (H1)- There is at least one statistically preferred spatial attribute in the sample population.

Microsoft Excel software facilitates the performance of ANOVA. Table 5 represents the analysis of ANOVA.

Table 5: One-way ANOVA of the Sample Population (Prepared in Microsoft Excel).

For Physical Dimension						
Easy Accessibility with Shorter Distance						
Source of Variation	SS	df	MS	F	P- Value	F- Crit
Between Groups	0.55	3	0.183333	0.689769	0.561077	2.724944
Within Groups	20.2	76	0.265789			
Total	20.75					
Furniture Design, Arrangement & Orientation						
Source of Variation	SS	df	MS	F	P- Value	F-Crit
Between Groups	43.6375	3	14.54583	3.268243	**0.025772**	2.724944
Within Groups	338.25	76	4.450658			
Total	381.8875					
Spatial Layout						
Source of Variation	SS	df	MS	F	P-Value	F-Crit
Between Groups	9.74	3	3.245833	0.97407	0.409516	2.724944

Within Groups	253	76	3.332237			
Total	263					
Well-proportionate Transition Zones						
Source of Variation	SS	df	MS	F	P-Value	F-Crit
Between Groups	9.74	3	3.245833	0.97407	0.409516	2.724944
Within Groups	253	76	3.332237			
Total	263					
Opportunity for Seeing, Hearing & Talking						
Source of Variation	SS	df	MS	F	P-Value	F-Crit
Between Groups	39.65	3	13.21667	3.743819	**0.014472**	2.724944
Within Groups	268.3	76	3.530263			
Total	307.95	79				
Pedestrian & Age-Friendly						
Source of Variation	SS	df	MS	F	P-Value	F-Crit
Between Groups	11.6375	3	3.879167	3.375119	**0.02263**	2.724944
Within Groups	87.35	76	1.149342			
Total	98.9875	79				
Variety of Mixed urban Activities						
Source of Variation	SS	df	MS	F	P-Value	F-Crit
Between Groups	8.2	3	2.733333	1.156644	0.331932	2.724944
Within Groups	179.6	76	2.363158			
Total	187.8	79				
Opportunity for Self-Expression & Identity						
Source of Variation	SS	df	MS	F	P-Value	F-Crit
Between Groups	48.3375	3	16.1125	3.87332	**0.012377**	2.724944
Within Groups	316.15	76	1.953289			
Total	157.9875	79				
Platform for Social Interaction						
Source of Variation	SS	df	MS	F	P-Value	F-Crit
Between Groups	48.3375	3	16.1125	3.87332	**0.012377**	2.724944
Within Groups	316.15	76	4.159868			
Total	364.4875	79				
Sense of Community						
Source of Variation	SS	df	MS	F	P-Value	F-Crit
Between Groups	9.5375	3	3.179167	1.627596	0.189985	2.724944
Within Groups	148.45	76	1.953289			
Total	157.9875	79				

Table 5 shows that the P-value is less than the significance level of 0.05 for six spatial attributes: furniture design, arrangement, and orientation; spatial layout; the opportunity for seeing, hearing, and talking; pedestrian and age-friendly; variety of mixed urban activities; and platform for social interaction. This indicates the acceptance of the alternative hypothesis (H1) for these features.

In other words, these are the most prominent spatial attributes of the urban third place, as intended by users. However, for other attributes, the P-value is greater than the significance level of 0.05, leading to the adoption of the null hypothesis (H0).

Stage 3: To assess the significance of differences between pairs of group means.

ANOVA highlights important spatial attributes, while Tukey's HSD Post Hoc Test is used to determine the specific pairs of group means that are substantially different. It is beneficial to go beyond ANOVA analysis to enhance understanding of group interactions and identify significant differences. This study uses a test to determine which age group mean pairings exhibit statistically significant differences in their preferred spatial attributes.

The Tukey's Criterion (T) is defined by: $T = Q\ \alpha\ (c, n\text{-}c)\ \sqrt{(MSE/ni)}$

Where… α- Level of Significance (Here, α- 0.05), c- No. of Columns, n- Total Sample Size, Q- Critical Value of Studentized Range Distribution, MSE- Mean Square Error from ANOVA ni- Sample size of one particular group which in this case is considered equal for all groups

By using this formula,

Value of Q - Q 0.05 (4, 76) = 3.715 (From Studentized Range Distribution Table)

Mean Square Error (MSE) for Physical Dimension from ANOVA= 5.311

Mean Square Error (MSE) for Functional Dimension from ANOVA= 4.678

Mean Square Error (MSE) for Social Dimension from ANOVA= 5.742

Tukey's HSD value for Physical Dimension = $3.715\ \sqrt{(5.311 \div 20)} = 3.715 \times 0.515 = 1.91$

In similar way

Tukey's HSD value for Functional Dimension = $3.715\ \sqrt{(4.678 \div 20)} = 3.715 \times 0.483 = 1.79$

Tukey's HSD value for Social Dimension = $3.715\ \sqrt{(5.742 \div 20)} = 3.715 \times 0.535 = 1.98$

Thus, if the mean difference value of a particular pair of age groups is greater than the identified Tukey's HSD value, the difference can be considered statistically significant. If the mean value is less than Tukey's HSD value, the difference is not significant for the pair.

We consider, $\bar{x}_1$= Mean of Age Group (11-25)

$\bar{x}_2$= Mean of Age Group (26-40)

$\bar{x}_3$= Mean of Age Group (41-55)

$\bar{x}_4$= Mean of Age Group (56-75)

Table 6: Mean of the Responses (Age-Group Wise).

Sr. no.	Age Group / Mean of Responses	Physical	Functional	Social
1	Age Group (11-25)= $\bar{x}_1$	6.5	6.9	7.4
2	Age Group (26-40)= $\bar{x}_2$	8.05	8.6	7.85
3	Age Group (41-55)= $\bar{x}_3$	6.4	7.25	8.85
4	Age Group (56-75)= $\bar{x}_4$	6.05	6.2	7.35

Table 7: Mean Differences between Pairs of Age Groups.

Sr. No.	Tukey's HSD Value for Physical Dimension = 1.91
1	$\lvert\bar{x}_1 - \bar{x}_2\rvert$ = 6.5 - 8.05 = -1.55 < 1.91
2	$\lvert\bar{x}_2 - \bar{x}_3\rvert$ = 8.05- 6.4 = 1.65 < 1.91
3	$\lvert\bar{x}_3 - \bar{x}_4\rvert$ = 6.4 – 6.05 = 0.35 < 1.91
4	$\lvert\bar{x}_1 - \bar{x}_4\rvert$ = 6.5 – 6.05 =0.45 < 1.91
5	$\lvert\bar{x}_1 - \bar{x}_3\rvert$ = 6.5 – 6.4 = 0.1 < 1.91
6	$\lvert\bar{x}_2 - \bar{x}_4\rvert$ = **8.05 – 6.05 = 2 > 1.91**
	Tukey's HSD Value for Functional Dimension = 1.79
1	$\lvert\bar{x}_1 - \bar{x}_2\rvert$ = 6.9 – 8.6 = -1.7 < 1.79
2	$\lvert\bar{x}_2 - \bar{x}_3\rvert$ = 8.6 – 7.25 = 1.35 < 1.79
3	$\lvert\bar{x}_3 - \bar{x}_4\rvert$ = 7.25 – 6.2 = 1.05 < 1.79
4	$\lvert\bar{x}_1 - \bar{x}_4\rvert$ = 6.9 – 6.2 = 0.7 < 1.79
5	$\lvert\bar{x}_1 - \bar{x}_3\rvert$ = 6.9 – 7.25 = -0.35 < 1.79
6	$\lvert\bar{x}_2 - \bar{x}_4\rvert$ = **8.6 – 6.2 = 2.4 > 1.79**
	Tukey's HSD Value for Social Dimension = 1.98
1	$\lvert\bar{x}_1 - \bar{x}_2\rvert$ = 7.35 – 8.85 = -1.5 < 1.98
2	$\lvert\bar{x}_2 - \bar{x}_3\rvert$ = 8.85 – 7.85 = 1 < 1.98
3	$\lvert\bar{x}_3 - \bar{x}_4\rvert$ = 7.85 – 7.40 = 0.45 < 1.98
4	$\lvert\bar{x}_1 - \bar{x}_4\rvert$ = 7.35 – 7.40 = - 0.5 < 1.98
5	$\lvert\bar{x}_1 - \bar{x}_3\rvert$ = 7.35 – 7.85= - 0.5 < 1.98
6	$\lvert\bar{x}_2 - \bar{x}_4\rvert$ = 8.85 – 7.40 = 1.45 < 1.98

Table 7 illustrates a particular pair of age group means that are statistically different. For the physical and functional dimensions, $|\underline{x}_2 - \underline{x}_4|$ are significantly different from each other. In contrast, for the social dimension, there are no pairs of age groups that are statistically different from each other. In other words, age groups (26-40) and age groups (56-75) elicit substantial differences in preferences for both physical and functional dimensions.

4. Discussion

4.1 Interpretation of Key Findings

The primary findings of this study emphasize the various associations between third-place users and their perceptions of third-place. This study examines an individual's subjective preferences for creating an urban third place, particularly focusing on physical, perceptual, visual, functional, temporal, and social dimensions. The data is analyzed in three stages. In stage 1, the Chi-Square Test of Independence is used to see if there is any significant association between the sample population and the responses received. It is observed that physical, functional, and social dimensions are found to be statistically significant in all groups of the sample population. It reflects the changing necessities of third-place users in the urban environment of cities. As Kara (2019) claims globalization has had a significant impact on the movement of people, their way of life, culture, and the exchange of ideas, leading to changes in urban areas at both macro- and micro-urban scales. In the case of the physical dimension, it greatly influences how people navigate and understand their environment. In the book 'The Image of the City' Chapman & Lynch (1962) emphasise the importance of legibility and elements such as paths, nodes, edges, and landmarks that help users navigate and form the mental maps of urban places. The significance of the physical dimension underscores the need for clear, easily accessible, and aesthetically pleasing urban third places that enhance the user's sense of orientation and place. Incorporating attributes such as furniture design, spatial layout, and transition zones into the design process makes the third place comfortable and inviting. Christopher Alexander, in his book 'A Pattern Language', highlights the same need for well-defined, inviting physical places that encourage public interaction (Alexander, Christopher; Ishikawa, Sara; Silverstein, Murray; Jacobson, 1977). The functional dimension holds crucial importance in terms of drawing users' attention by facilitating a variety of mixed urban activities, opportunities for seeing, hearing, and talking, as well as pedestrian and age-friendly places. Jane Jacob advocates the importance of mixed-use activities, vibrant street life, and functional utility of public places in her book, 'The Death and Life of Great American Cities.' She highlights the role of these places in fostering community engagement and safety through '*eyes on the street*' (Jacob, 1993). The significance of the social dimension primarily stems from the need to encourage community and social interaction. In the concept of 'The Production of Space', coined by Henri Lefebvre, he focuses on the connection between social activities and the formation of spaces. He suggests that space is socially produced and that social interactions are a critical component of how space is experienced and valued (Lefebvre, 1991). So, we can observe that the human-centric approach plays a crucial role in urban design practices. To support the statistical significance of the physical, functional, and social dimensions observed in the chi-square test, an ANOVA is employed as a parametric test in stage 2. It concretizes the initial observations of the results on the basis of which a larger sample population can be tested in order to achieve generalizability of the findings. This test demonstrates that furniture design, arrangement, and orientation, along with spatial layout, are crucial factors for the physical dimension. The most prominent responses for the functional dimension include attributes such as the opportunity for seeing, hearing, and talking, pedestrian and age-friendly features, and a variety of mixed urban activities. These are the attributes again concerned with the human scale. While demarcating the importance of the human dimension, Hussein (2018) adds that boosting walkability, as a component of pedestrianism, results in an improvement in the overall quality of the urban environment. Continuing with social dimensions, a platform for social interaction is the primary quality that is significant for the users. Social interaction at different levels has a huge impact on strengthening the bond within the community. Agboola, O. P., Rasidi, M. H., Said, I. B., Zakka, S. D.,

& Shuaibu (2018) emphasize the importance of social interaction as a medium for the enhancement of human well-being. Thus, when it comes to creating an urban third place, these are the spatial attributes individuals prefer the most. Urban designers can particularly consider all three dimensions holistically, recognising that physical design, functional utility, and social dynamics enhance the quality of urban life. To deepen our understanding of this relationship and gain more insights into the influence of age on these factors, Tukey's HSD Post-Hoc Test is employed in stage 3. It highlights that perceptions of both physical and functional dimensions are considerably different between the age groups (26-40) and (56-75). It means that these two age groups have significantly different preferences and needs, which they expect to be satisfied in the formation of an urban third place. This finding might be helpful in demarcating the criticalness of the term '*inclusive sociability*' in the formation of an urban third place by considering the diverse demands of various age groups in society. From this discussion, we might infer that the interrelationship between spatial attributes of third place, an individual's subjective preferences, and needs and needs along with his or her age contribute to a great extent to forming the subjective 'Sense of Place' of an individual, which can be a pivotal aspect in the field of urban design. It affirms that the design process of cities must accommodate the human dimension in a sensible manner, which can be followed by urban design practices at the neighbourhood and city levels.

4.2 Implication of Future Directions

Thus, as a result of the findings, overall insights can be drawn at the elementary level for practitioners in the field of urban design in order to develop more effective urban third places.

- Human Scale Design: Designing the urban third places that prioritize the human experience by ensuring that these places are accessible, comfortable, and visually appealing to users. (Physical Dimension)
- Multi-functional Use: Creating places that can serve various purposes and activities, allowing for flexibility and adaptability in their use. This approach supports diverse needs and promotes continuous engagement, enhancing the user experience. (Functional Dimension)
- Social Inclusivity and Engagement: Designing places that foster social interactions and are inclusive of all ages, backgrounds, and abilities. This includes providing areas for seating, gathering, and activities that encourage people to connect and engage with one another. (Social Dimension).

5. Conclusion

Thus, this study identifies the patterns of spatial quality attributes that users subconsciously build about the urban third place, which in this case is represented by a café. These patterns of built form, as claimed by Lang (2017) are closely interconnected to satisfy human needs at various levels. While quoting Maslow, H. Abraham, n.d., Lang states that these needs prompt individuals to exhibit particular practices developed in a particular setting that is generally considered a culture. Another significant aspect that we can consider is the result of implementing these strategies in urban third places. A better urban environment boosts person-to-person contact. (Fang & Slaper, 2022) mention that urban third places open avenues for various social, cultural, and economic activities to foster, which are important factors for improving urban economics. Clearly, the socio-economic aspect of urban environments can be greatly impacted by improved urban third places in terms of design, which in turn promotes urban culture.

An apparent impact on social well-being and economic activity may be observed in the following aspects:

- Increased spending with increased foot traffic through accessible, attractive, and comfortable design.
- Increased visibility for local businesses and entrepreneurs through multi-functional design.
- Enhanced social capital and community engagement through inclusive design.

Although this research presents useful insights, the particular data collection method might draw inferences to a limited extent. To respond to this constraint, future studies can be executed around the same phenomenon by performing projective interviews and case studies, followed by quantitative data

collection methods leading to method triangulation. Being exploratory in nature, projective interviews can help generate hypotheses for future investigations.

Case studies allow for a detailed examination of specific urban third places, providing a contextual understanding of attributes. Analyzing multiple case studies allows researchers to identify patterns and differences across various contexts. Case studies can provide real-world examples that illustrate theoretical concepts and demonstrate practical applications. Quantitative surveys are essential for validating the insights gained from qualitative methods as well as generalizing the results. (Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J., & Neville, 2014) mention that triangulation is considered a qualitative research approach that aims to assess validity by combining information from multiple sources. As a result, it might provide a researcher with more practical insights while also improving the precision and generalizability of the results. Thus, a study gives us the strong sense that urban third places must be re-imagined and re-structured from a design perspective in order to have a better socio-economic urban environment that meets contemporary needs.

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The author(s) declare(s) no conflicts of interest.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author.

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Not applicable.

CRediT author statement:

Ar. Upendra Vinay Joshi: Conceptualized the study, developed the methodology, and conducted the formal analysis and investigation. Prof. Snehal Nagarsheth: Contributed to the writing of the original draft, and performed review & writing. All authors have reviewed and approved the final version of the manuscript.

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