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MORALITY BEFORE KNOWLEDGE

Social dynamics and spatial design: A behavioral architecture study of adolescent gathering patterns

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ABSTRACT

Background: City parks are important social spaces, especially for teenagers, but the design of public open spaces often does not take behavioral aspects into account. Previous studies have focused more on the physical function of open spaces than on user behavior. This paper analyze the influence of layout and design elements (paths, seating, trees, lighting) on the social interaction patterns of adolescents. **Methods:** Behaviorist case study (Yin), non-participatory observation, behavior mapping, and in-depth interviews. **Findings:** The study found that Indonesia Kaya Parks a functions as an inclusive third place for adolescents, where spatial elements like flexible seating, shaded vegetation, and warm lighting significantly enhance the frequency and quality of informal social interactions. It was found that zones with warm lighting, dense vegetation, and flexible seating became centers of social interaction. **Conclusion:** The spatial configuration and micro-design elements of Indonesia Kaya Parks effectively accommodate adolescents' behavioral needs, confirming its role as a socially responsive urban park. **Novelty/Originality of this article:** This research uniquely combines quantitative data with spatial-perceptual mapping to reveal how adolescents navigate and emotionally respond to varying degrees of spatial enclosure in public parks—an approach rarely applied in behavioral architecture studies.

KEYWORDS: behavioral architecture; public open space; social interaction; teenagers

1. Introduction

As urbanization increases, public open spaces become a vital element in the urban fabric, providing a venue for social interaction across ages and backgrounds (Alawiyah & Liata, 2020; Carmona, 2021; Vukovic et al., 2021). For adolescents, public spaces serve not only as transit or recreational venues, but also as important venues for informal socialization, particularly through "hanging out" activities, which have significant social significance in shaping group identity and peer solidarity. Unfortunately, previous studies have limited understanding of the actual behavior of space users, particularly adolescents, as their approaches tend to be normative and lack direct observation. These studies often ignore the spontaneous dynamics of space, creating a gap between spatial design and everyday use.

In an effort to fill this gap, this study adopts several relevant theoretical approaches, such as behavioral architecture (Gehl, 2010; Lang, 1987; Yusa et al., 2023), which emphasizes the influence of design on human behavior in space, as well as theories of spatial syntax and environmental amenity that highlight how spatial configurations influence movement patterns and interaction possibilities. Proxemics and territoriality theories are also used to understand social distance preferences and adolescents' tendency to 'claim'

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certain spaces as their comfort zones (Dwipayana & Yupardhi, 2021; Firzandy & Purnomo, 2018). This third approach provides a rich conceptual framework for reading the relationship between spatial design and social behavior patterns more contextually (Mahfiroh et al., 2024).

Specifically, this research highlights the lack of systematic local studies that combine visual and auditory observations to interpret the behavioral patterns of public space users, particularly adolescents (Alauddin et al., 2020). A multisensory approach is crucial for capturing the complexity of social interactions, which are often non-verbal and contextual (Cekaite & Mondada, 2020; Fairhurst & Valori). This lack of approach creates a gap in the literature, particularly in the context of Indonesian cities, where informal social practices are deeply embedded in spatial culture.

This study aims to explore how specific spatial elements—such as enclosure, visibility, accessibility, and comfort—influence adolescents' informal social activities in public spaces. The primary focus is to uncover how spatial configurations can facilitate or hinder forms of social interaction such as hanging out, chatting, or even simply passive presence in open spaces (Nurhijrah & Wikantaria, 2019). This study starts from the hypothesis that zones with specific spatial characteristics will be more likely to encourage specific social activities. Therefore, the results of this study are expected to provide a tangible contribution to urban practitioners who are more sensitive to adolescent social behavior and enrich academic discourse on the relationship between space and behavior in the local urban context.

2. Methods

This study uses a descriptive quantitative approach to measure adolescents' perceptions and behaviors regarding public space design elements that influence their social interaction patterns in Taman Indonesia Kaya, Semarang. The quantitative approach was chosen because it presents numerical data that can be analyzed statistically to objectively answer the research questions.

2.1 Research setting, participants, and instruments

The study was conducted at Taman Indonesia Kaya, a public space located in downtown Semarang and known as a favorite gathering spot for teenagers. Data collection took place from October to November 2024, taking into account both weekdays and weekends to observe variations in visiting behavior.

The population in this study was all adolescent visitors (aged 13–21) who engaged in social activities in the park. Purposive sampling was used to identify respondents relevant to the research characteristics. A total of 40 respondents were successfully interviewed and analyzed.

The main instrument was an open-structured questionnaire developed based on behavioral architectural indicators (Gehl, 2010; Khosyati & Istijanto, 2023; Lang, 1987), proxemic theory (Hall, 1966), and urban open space design principles. The questionnaire consisted of 19 questions covering; frequency of visits, space preference, ease of interaction, perception of spatial elements (paths, lighting, vegetation, seating, stage), and social interaction experiences.

2.2 Data collection, analysis, validity, and ethics

Data collection was carried out using structured questionnaire-based quantitative interviews, accompanied by light field observations to validate the respondents' answers. The interviews were conducted directly by the researchers at the park location, with the data collection process taking place between 15.00 and 18.00 WIB. The data were analyzed using SPSS version 26, employing several techniques, including descriptive statistics (frequency and percentage), multi-response analysis for questions with multiple answers,

and cross-tabulation to examine relationships between variables. The analysis results were presented in tabular form and further interpreted narratively to strengthen the empirical findings relevant to the study of behavioral architecture. Prior to the interviews, respondents were given a brief explanation and agreed to participate voluntarily. All data collected will be kept confidential and used solely for academic purposes.

3. Results and Discussion

3.1 Frequency of visits to Taman Indonesia Kaya

To understand the intensity of public space use by teenagers at Taman Indonesia Kaya, one indicator examined was the frequency of respondents' visits. This frequency of visits is important to determine the extent to which the park is part of teenagers' social routines and daily activities. Data obtained from interviews were then categorized into four levels of visitation: daily, several times a week, once a week, and rarely (once a month or less). The following is a summary of the respondents' frequency of visits to the park.

Table 1. Frequency of visits to Taman Indonesia Kaya

Frequency of Visits	Number of Respondents	Percentage
Every day	5	12.5%
Several times a week	12	30.0%
Once a week	10	25.0%
Rarely (1x/month or less)	13	32.5%
Total	40	100%

Table 1 shows that the majority of respondents visit the park regularly, with "several times a week" (30%) and "rarely" (32.5%) being the two largest groups. This indicates that Taman Indonesia Kaya serves as a social space that is not merely incidental, but also functional in the routine activities of teenagers. The "every day" category, which reached 12.5%, is also quite significant, indicating that there are groups of teenagers who use this park as a primary space for activities or socializing. This variation in visit frequency may reflect the diverse motivations and spatial needs felt by teenagers using this public space.

Frequency of visits is an important indicator of user engagement, particularly among teenagers, with a particular public space. A survey of 40 teenage respondents in this study revealed quite varied visitation patterns. The results show that more than half of respondents (67.5%) regularly visit Taman Indonesia Kaya at least once a week. This indicates that the park has become an integral part of the social activities of young people in Semarang.

This finding aligns with the behavioral architecture concept proposed by Gehl (2010) and Siregar (2021), which states that regularity in the use of public space is a sign of the design's success in fulfilling basic human social needs, such as gathering, interacting, and feeling accepted within a spatial community. In this case, repeated visits by teenagers can be read as a form of spatial appropriation; parks are not only places of transit or temporary entertainment, but also function as "permanent social spaces" in everyday life.

Furthermore, Lang (1987) stated that attachment to public spaces is influenced by the activity support offered by the physical environment. If a space provides conditions that support a group's dominant activity—in this context, "hanging out" as a typical form of socialization for teenagers—then the space will experience natural user repetition (Mousavi & Ghayoomzadeh, 2020; Nusrat, 2025; Van Aalst, 2021). This is evident from the fact that 12.5% of respondents visit parks daily, a high frequency rarely achieved by other public spaces, particularly in the urban context of Indonesia (Khairunnisa & Lissimia, 2024).

Furthermore, the high number of visitors in the "several times a week" category (30%) also indicates that the park has high levels of accessibility, spatial comfort, and visual and auditory appeal. As noted by Arinta et al. (2024), the intensity of public space use by young users is strongly influenced by a sense of belonging that arises from the accumulation of

positive experiences in the space. Therefore, the high frequency of visits not only demonstrates the park's functional efficiency but also demonstrates its success in forming a psychological connection between adolescents and urban spaces.

Specifically, the high percentage of weekly visits can also be interpreted as an indication that the space offers temporal flexibility—that is, the capacity of the space to accommodate various activities at different times. This reinforces the park's position as a third place as defined by Oldenburg, namely a non-formal space outside the home and school that allows for the formation of informal social networks (Evans & Stokols, 1976).

Thus, the frequency of visits by teenagers to Taman Indonesia Kaya not only indicates the high popularity of the park, but also reflects its success as a social space that responds to the behavioral needs typical of adolescents through appropriate design elements and a supportive spatial atmosphere.

3.2 Gathering area preferences

In addition to visit frequency, preferences for specific locations or areas within the park are also important indicators in understanding youth spatial behavior. Areas deemed comfortable by respondents generally relate to physical amenities (such as shade and seating), as well as social factors such as visibility, accessibility, and proximity to activity centers. Through open-ended questions, respondents were asked to indicate which part of the park they found most comfortable for gathering with friends. The categorization of respondents' answers is presented in Table 2 below.

Table 2. Gathering area preferences

The Most Comfortable Park Area	Frequency	Percentage
Near the fountain	10	25%
Under the shady tree	16	40%
Near the open stage	9	22.5%
Other	5	12.5%
Total	40	100%

Table 2 shows that the area under shady trees was the most preferred location by respondents, with a percentage reaching 40%. This supports the findings of previous studies that stated that vegetation elements can increase comfort and extend the duration of a person's stay in an open space. Areas near fountains and stages also showed a fairly high level of preference, at 25% and 22.5%, respectively. These two elements can be associated with being *focal points* that support social interaction and create visual and auditory appeal. Meanwhile, the "other" response reflects the diversity in perceptions of comfort that are likely influenced by personal experiences or specific activities undertaken. These preferences indicate that the presence of well-planned physical elements of a park has a positive correlation with the space use patterns of adolescents.

3.2.1 Favorite areas for gathering

The choice of gathering areas reflects how adolescents perceive comfort, safety, and flexibility in public spaces. In the context of behavioral architecture, the spaces consistently chosen by users reflect the relationship between spatial configuration and their social and psychological needs (Gehl, 2010; Lang, 1987).

As many as 40% of respondents chose areas under shady trees as the most comfortable places to gather. This reinforces previous research findings that vegetation has a direct influence on perceptions of thermal and psychological comfort (Marlina & Ariska, 2021). Shady trees not only serve as shade from the sun but also create a semi-enclosed space that provides a sense of security and tranquility—aligning with the proxemic needs of adolescents who seek less exposed spaces while still allowing for social observation (Evans & Stokols, 1976).

Furthermore, the area near the fountain and the outdoor stage was chosen by 25% and 22.5% of respondents, respectively. These two locations are characterized as focal points, both visually and auditorily. The sound of splashing water and the activity on the stage provide a pleasant and dynamic environmental stimulus, encourage social engagement, and create an attractive communal space (Kusumastuti & Kusuma, 2022). This suggests that spatial elements that offer multisensory stimuli are more appealing to adolescents, who are psychosocially inclined to express themselves and seek out social centers (Arinta et al., 2024).

The 12.5% "other" option demonstrates a diversity of spatial preferences based on personal experience. In this context, variables such as microclimate, proximity to amenities (WiFi, restrooms, food outlets), and even crowd density likely influence decisions about seating or gathering points.

From the perspective of territoriality theory (Hall, 1966), the most frequently chosen areas are typically those that provide a balance between social connectedness and personal protection. Therefore, the preference for shady trees and proximity to attractive elements can be understood as adolescents' search for places that allow them to "claim social space" while still maintaining visual boundaries with their surroundings.

Thus, these findings emphasize that urban park design should provide diverse zoning areas that take into account thermal, visual, auditory, and psychological factors. Gathering areas cannot be designed uniformly, but must be contextualized to the needs of specific users—in this case, teenagers who have a high need for informal social interaction in a friendly and non-intimidating setting.

3.3 Ease of social interaction in the park

One of the main objectives of this study is to examine the extent to which public open spaces, specifically Taman Indonesia Kaya, can facilitate social interaction among adolescents. In the context of behavioral architecture, user perceptions of ease of interaction are an important indicator for assessing the success of a spatial design. Therefore, respondents were asked whether they found it easier to interact socially in this park compared to other locations. Their answers were categorized and presented in Table 3 below.

Based on the results in Table 3, the majority of respondents (70%) stated that they found it easier to interact socially in Taman Indonesia Kaya compared to other public spaces. This percentage indicates that the park has met most of the spatial and psychological criteria that support informal social interaction, such as openness of space, visibility between individuals, and easy access between zones. Conversely, only 5% of respondents found interaction in the park more difficult, possibly due to personal experience, the time of visit, or the density of users at the time. This finding strengthens the assumption that the spatial layout and physical elements of the park can significantly shape the social communication patterns and collective participation of adolescents in public spaces.

Table 3. Ease of social interaction in the park

Respondents' Answers	Amount	Percentage
Easier than anywhere else	28	70%
Just the same	10	25%
Harder than anywhere else	2	5%
Total	40	100%

In behavioral architecture studies, the ability of public spaces to facilitate informal social interaction is a key indicator of successful spatial design. Parks, as urban open spaces, are judged not only by their visual beauty, but also by their ability to support spontaneous and comfortable communication between individuals (Gehl, 2010; Lang, 1987). As many as 70% of respondents stated that they found it easier to interact socially in this park than in other public spaces. This indicates that the park has successfully facilitated spatial

conditions that allow for interpersonal proximity without creating social tension or awkwardness, as explained in Hall's (1966) proxemics theory.

The main factors that facilitate ease of interaction are visual openness between zones, which enables users to gradually observe and approach other groups; the presence of transitional elements such as seating, walkways, and communal points like fountains or stages, which create soft boundaries between social activities; and the informal atmosphere shaped by open space design, vegetation, and lighting, which encourages non-verbal communication to occur without strong social pressure (Evans & Stokols, 1976).

This concept aligns with the third place proposed by Oldenburg in Marlina & Ariska (2021), namely a neutral space outside the home (first place) and school/campus (second place), where social relationships are formed voluntarily, egalitarian, and not bound by hierarchy. In this context, Taman Indonesia Kaya serves as a third place for teenagers, a place where they can "be themselves" in spontaneous social interactions.

In contrast, only 5% of respondents found it more difficult to interact in the park. Factors such as excessive crowding, lack of personal space, or a visit schedule that is out of sync with their social group may influence this perception. This aligns with the findings of Fadhilah & Lissimia (2023), who stated that perceptions of social comfort in public spaces are also influenced by usage time and spatial density.

Meanwhile, respondents who answered "the same" (25%) indicated a similarity in experience between this park and other public spaces. This means that while parks have features that support interaction, external factors such as peer groups, specific activities, and familiarity with the surrounding environment also play a role in perceptions of social ease.

Thus, these findings confirm that the quality of public space design, especially in terms of visibility, zone transitions, and social atmosphere, directly contributes to the creation of healthy and sustainable social interactions, especially for adolescents who are at the stage of social identity exploration.

3.4 Park elements that support interaction (multi-response analysis)

In the context of behavioral architecture, physical elements in public spaces such as lighting, vegetation, seating, and connectivity between areas play a significant role in shaping social interaction patterns. To identify which elements adolescents believe most support social interaction in Taman Indonesia Kaya, respondents were asked a multi-response question. They could name more than one element that they believed supported gathering, communicating, or simply passive interaction. The analysis results of this question are presented in Table 4 below.

Table 4. Park elements that support interaction (multi-response analysis)

Selected Spatial Elements	Number of Respondents (n=40)	Percentage (%)
Warm lighting	22	55%
Shady vegetation	26	65%
Flexible seating	28	70%
The path connecting the areas	18	45%
Stage as a gathering point	20	50%

From the results of the multi-response analysis in Table 4, it can be seen that flexible seating (70%)**,** shady vegetation (65%), and warm lighting (55%) are the three elements most frequently mentioned by respondents as factors supporting social interaction. These elements reflect the need for physical comfort and an atmosphere conducive to socializing. Flexible seating allows for a variety of group formations, while vegetation and lighting provide visual protection and a pleasant atmosphere. In addition, connecting paths (45%) and stages (50%) are also recognized as catalysts for interaction, with the stage functioning not only as a visual element but also as a center of collective activity. These findings

strengthen the argument that spatial configurations designed with user behavior in mind can enhance the potential of parks as inclusive social interaction spaces for adolescents.

The physical elements of public spaces play a central role in shaping the quality of social interactions, particularly for youth groups who use parks as informal socializing venues. In the behavioral architecture approach, elements such as seating, vegetation, lighting, and path connectivity are considered environmental stimuli that can facilitate or hinder communication between users (Gehl, 2010; Lang, 1987).

From these results, flexible seating (70%) emerged as the element that contributed most to creating social interaction. This suggests that seating designs that can be repositioned or combined according to group needs provide a sense of control over the space and enhance comfort in communication (Fadhilah & Lissimia, 2023). As stated by Lang (1987), the flexibility of public furniture can increase users' adaptability to changing social needs across time and groups.

Shady vegetation also dominated the choices (65%), indicating the importance of green elements as shade and as a semi-enclosed zone that provides a sense of security and intimacy. Marlina and Ariska (2021) emphasize that the presence of vegetation is not only an aesthetic factor but also has a psychological function as a natural visual barrier that supports communication without high social pressure—in line with the concept of spatial affordance in behavioral architecture.

Warm lighting was chosen by 55% of respondents, indicating that lighting plays a significant role in creating a comfortable atmosphere at night. Light with yellow or orange tones creates a psychological effect of warmth and increases a sense of security, in contrast to bright white lighting, which tends to create a formal and overly open effect (Khairunnisa & Lissimia, 2024). This suggests that lighting can be interpreted as a form of non-verbal communication that shapes the atmosphere of a space.

The stage (50%) and connecting paths (45%) were also mentioned as supporting interaction. The stage serves as a focal point and a place for collective expression, while well-designed connecting paths can enhance connectivity between social zones without creating disruption or fragmentation of activities. In the space syntax approach, spatial connectivity is highly correlated with the intensity of encounters between individuals (Space Syntax Theory, 2021).

The combination of these elements demonstrates that adolescents' social interactions depend not only on the presence of friends but also on the quality of the spatial atmosphere created by the park's micro-spatial design. These elements work not in isolation but synergistically to create conditions that support casual encounters, planned gatherings, and even passive social interaction.

Thus, these results confirm that urban parks responsive to youth behavior must prioritize design elements that are flexible, psychologically comfortable, and adaptable to the time of use. A successful space is not simply "filled," but also capable of becoming a sustainable social hub favored by its users.

3.5 Area preference for interaction (open vs. shaded)

Users' spatial preferences for open or shaded areas reflect their need for comfort, privacy, and environmental support for social activities. In this study, respondents were asked to report their preferences for locations for interaction—whether they preferred open (high exposure) or shaded/enclosed areas. This preference is closely related to proxemics and territoriality theory, which explains how individuals choose spaces based on social distance and perceived safety. Data on interaction area preferences are presented in Table 5 below.

Table 5. Area preference for interaction (open vs. shaded)

Area Preferences	Frequency	Percentage
Open area	14	35%
Shaded / covered area	26	65%

The results in Table 5 show that the majority of respondents (65%) preferred shaded or enclosed areas for interaction. This preference indicates that adolescents tend to choose spaces that provide a sense of protection, both from climatic aspects (heat and rain) and psychological aspects such as privacy and lower social surveillance. Conversely, open areas were chosen by 35% of respondents, most likely by those engaging in more active activities or large groups. This finding reinforces the importance of providing a variety of enclosures in urban park design to accommodate diverse user preferences. In the context of behavioral architecture, this also suggests that public spaces designed with proxemic comfort in mind will be more effective in supporting informal social activities, particularly among adolescents.

Users' preferences for area types—whether open spaces or more enclosed, shaded spaces—reflect the need for spatial comfort, social privacy, and psychological security. In behavioral architecture studies, these tendencies are influenced not only by physical design, but also by perceptions of control over the environment and the social interactions that occur within it (Lang, 1987; Hall, 1966).

Sixty-five percent of respondents stated they preferred enclosed or shaded areas for social interaction. This indicates that for most teens, the comfort of being in a semi-enclosed space—such as under a large tree or behind a landscape element—is greater than being in an open, unprotected area.

This preference aligns with the proxemic principles developed by Hall (1966), which explain that humans tend to choose spaces based on comfortable social distance and the degree of control over proximity to others. Enclosed areas offer visual protection, thermal protection, and reduced social exposure, creating a more private atmosphere even in public spaces.

Furthermore, territoriality theory states that humans have a drive to "claim" certain spaces that feel safe and familiar (Evans & Stokols, 1976). In the context of adolescents, enclosed spaces provide an opportunity to create exclusive informal zones, where they can talk without interruption, show self-expression, or even avoid social supervision from adults or other visitors. Khairunnisa & Lissimia (2024) showed that adolescent users tend to choose spaces with light physical boundaries as personal territories, which increases comfort in engaging in social activities.

On the other hand, 35% of respondents chose open areas, which could be related to the need for more dynamic activities, interaction in large groups, or visual openness that provides a liberating sensation. Open areas may also be chosen because they offer high visibility, allow for more active social observation, and encourage participation in public activities, such as performances or open group discussions (Gehl, 2010).

These shared preferences suggest that an ideal public park should be able to provide a variety of enclosures, ranging from wide-open spaces, semi-enclosed spaces, to intimate spaces. This diversity is essential to accommodate the spectrum of social and psychological needs of users, as suggested by Lang (1987), who argued that successful public spaces should be able to offer choice architecture, namely flexible spatial options for users.

Thus, these findings confirm that the need for shaded and enclosed spaces is not simply a matter of protection from the weather, but also part of adolescents' adaptation strategies to a dynamic social environment. Architects and urban designers should consider designs based on human-centered spatial psychology, which are not only aesthetic but also empathetic to user behavior.

3.6 Synthesis and confirmation of findings

Based on the quantitative analysis of five main categories—frequency of visits, favorite areas, ease of interaction, elements supporting interaction, and spatial preferences—it can be concluded that Taman Indonesia Kaya plays a significant role as an adaptive social space capable of accommodating the informal interaction needs of youth in Semarang City. These findings confirm the close relationship between spatial configuration, micro-design

elements, and the social behavior of young users in public open spaces (Peterson, 2024; Pratiwi, 2016).

First, the high frequency of visits (67.5%) confirms that the park has become part of the teenagers' social routine. Their presence is not incidental, but rather a recurring expression of social needs (Gehl, 2010). This indicates that the park has filled the void of a third place (Oldenburg in Marlina & Ariska, 2021) for teenagers—a neutral space where they can socialize freely, without formal pressure from home or educational institutions.

Second, preferences for specific areas—such as under shady trees, near fountains, and open-air stages—indicate that adolescents intuitively choose spaces that offer thermal comfort, social visibility, and flexibility of use. This demonstrates that public spaces must not only "look attractive" but also functionally support a variety of behavioral settings that align with the social life patterns of their users (Lang, 1987; Khairunnisa & Lissimia, 2024).

Third, the perception that this park facilitates interaction (70%) more than other public spaces indicates the success of the park design in creating spatial coherence—namely, logical relationships between zones, open visualization, and an informal atmosphere that allows interaction to occur spontaneously (Hall, 1966; Evans & Stokols, 1976).

Fourth, spatial elements such as flexible seating (70%), shady vegetation (65%), and warm lighting (55%) were shown to play a significant role in encouraging social activity. These results emphasize that microspatial elements are not merely aesthetic complements, but rather strategic tools in the social design of spaces that stimulate collective engagement and create interpersonal comfort.

Fifth, the tendency to choose enclosed/shaded areas (65%) highlights the importance of territorial comfort and the need for social control in open spaces. Enclosed spaces allow adolescents to create personal boundaries without isolating themselves, aligning with proxemics theory, which emphasizes the importance of social distancing in informal interactions (Hall, 1966).

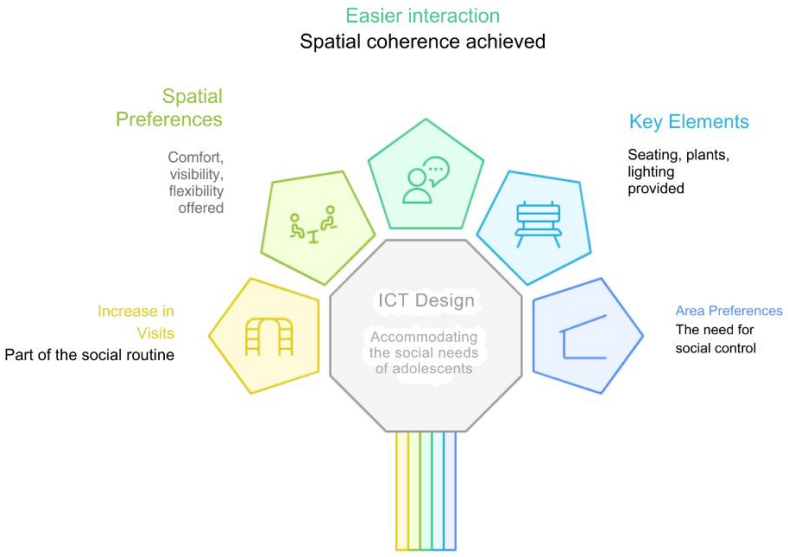

Fig. 1. ICT facilitates social interaction among teenagers

Synthetically, all these findings indicate that Taman Indonesia Kaya has succeeded in becoming a dynamic social space, where spatial configuration and design elements mutually support the creation of social interaction patterns typical of adolescents. This overall analysis emphasizes the need for a context-based behavioral architecture approach, which understands users not as design objects, but as social agents who actively shape and are influenced by their space. Thus, this study not only provides empirical evidence on the relevance of design elements to social behavior, but also underscores the importance of designing public spaces that are human-centered, adaptive, and sensitive to the socio-cultural dimensions of their users.

The quantitative findings in this study demonstrate a close relationship between the spatial configuration of city parks and the dynamics of adolescents' social interactions. However, to gain a deeper understanding of how adolescents respond to social spaces in parks, this study also visualizes spatial preferences based on a spectrum of openness and enclosure. This visualization enriches the analysis because it allows for a continuous spatial reading, rather than discrete categories such as "open" or "closed."

The visualization in Figure 1 is structured around three dominant zones identified by respondents. The first is the Open Stage, represented in yellow on the left, which functions as an open space accommodating public and expressive social activities. The second is the Under the Tree area, shown in orange at the center, serving as a transitional space between open and enclosed areas while offering thermal comfort, a light visual boundary, and moderate social visibility. The third is the Shaded or Covered Area, depicted in red on the right, which provides a sense of protection, stronger social control, and greater privacy.

The amplitude waves on the graph represent the intensity of spatial preference, the higher and denser the waves, the more respondents prefer that zone (Barriopedro et al., 2023; Cheng et al., 2025). This graph pattern shows the highest peaks in the semi-enclosed (under trees) and closed (shaded) zones , indicating that adolescents generally feel more comfortable in spaces that provide thermal and social protection, while still remaining connected to surrounding activities.

The novelty of this finding lies in the continuous representation of spatial openness, which replaces rigid classifications and allows for a more flexible and human-centered interpretation of space. It also emerges from the integration of quantitative data with spatial-perceptual insights, a methodological combination that is rarely applied in behavioral architectural studies of youth public spaces. Furthermore, the use of wavy spatial graphics serves as a metaphorical expression of emotional and social responses, symbolizing the fluctuating waves of social communication. With this approach, research reveals not only *what* adolescents choose, but also *why* and *how* they navigate space socially and spatially. The ideal park design for adolescents, therefore, should provide a flexible spectrum of spaces, ranging from open spaces to semi-enclosed spaces to highly protected areas—all designed not as passive zones, but as spaces that invite adaptive social participation.

These findings expand the behavioral architecture framework, highlighting that adolescents' social interactions are strongly influenced by gradations of spatial enclosure and micro-affordance, not just the presence of furniture or amenities. An inclusive urban park is one that is able to "negotiate" with the social needs of its users—making space, not simply filling space. Based on the data analysis results from the five tables presented, it can be concluded that Taman Indonesia Kaya plays a significant role as a public space that supports social interaction among youth.

These findings can be summarized as follows, first, the relatively high frequency of visits shows that the park has become part of adolescents' social routines, with 67% of respondents reporting visits at least once a week (Table 1), confirming its role as an actively used space relevant to their social needs. Second, gathering preferences were concentrated in areas that provide comfort and shade, particularly under trees (40%) and near fountains (25%) (Table 2), underscoring the significance of microclimatic and visual factors in shaping desirable social spaces. Third, from a perceptual perspective, 70% of respondents stated that it was easier to engage in social interactions in this park compared to other locations (Table 3), supporting the view that spatial design fosters inclusivity and social accommodation for youth. Fourth, flexible seating (70%), shady vegetation (65%), and warm lighting (55%) were identified as the most important elements facilitating interaction (Table 4), highlighting the role of physical comfort and spatial flexibility in the success of public spaces. Finally, the preference for shaded or enclosed areas (65%) emphasizes the importance of enclosure and visual or physical protection in supporting informal interactions, consistent with proxemics theory, which stresses the influence of environmental factors on comfortable social distancing (Table 5).

Overall, these findings confirm that the spatial design of city parks, which considers microclimatic comfort, seating flexibility, and inter-zone connectivity, has a direct influence on the intensity and quality of adolescent social interactions. Therefore, the design of public open spaces should consider user behavior contextually, not just from an aesthetic or visual perspective.

4. Conclusions

This research confirms that public spaces are not just “places” but also “social events” formed through the interaction between spatial configuration and user behavior. A study of adolescents in Taman Indonesia Kaya revealed that micro-elements in design—such as flexible seating, vegetative cover, and warm lighting—have a significant impact on the intensity and quality of social interactions.

Beyond mere statistics, the research findings demonstrate that adolescents intuitively navigate spaces based on a sense of comfort, social control, and the ability to express themselves. The preference for semi-enclosed and shaded spaces reflects the need for a safe social space, yet open to collective dynamics. This underscores the importance of design that does not force behavior but instead invites social choices in a subtle and adaptive way.

The unique contribution of this research lies in the integration of a quantitative approach with perception-based spatial visualization. The spatial preference waveform developed in this study introduces a new way of reading the continuum of social space—from open to closed—as a reflection of the user's psychological landscape. This approach could provide a new methodological foundation in the study of behavioral architecture, as it captures spatial nuances often overlooked by conventional classifications.

Practically, the results of this research point to one important idea: the architecture of public space should not be neutral. It must be user-friendly, especially for vulnerable or marginalized groups like teenagers, who are often overlooked in urban space design. By understanding how teenagers choose, avoid, or "claim" space, architects can design parks and open spaces that are not only functionally viable but also socially and emotionally relevant.

In the context of future architectural development, this research serves as a reminder that the best architecture is not the most monumental, but the most humane. City parks are not just green spaces, but also spaces for dialogue, identity growth, and a safe space to be yourself—especially for those who are developing their identity as teenagers.

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Conflicts of Interest

The author declare no conflict of interest.

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