Definitions for Public, Private, and In-between Spaces in Student Housing

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Abstract

In any housing design, finding the right balance between public and private spaces is one of the most difficult issues. In terms of student housing, many scholars argue that public and private spaces are equally important for promoting interaction among the students as well as ensuring sufficient privacy in shared dwellings. This research aims to establish definitions for public, private, and in-between spaces in student housing, using both qualitative and quantitative methods. Firstly, a literature review is conducted and qualitatively analyzed from the urban and socio-cultural perspectives to derive the initial definitions. Four selected student housing cases, both local and international, are then analyzed according to the initial definitions. Analysis of these cases provides evidence that the initial definitions of public, private, and in-between spaces can be modified in this building type.

The results of this research indicate that in student housing, the definitions of public, private, and in-between spaces not only conform to those derived from the literature review but also have their own particularities. Common, privatized public, ambiguous, and adaptable spaces as in-between spaces are found to exist both in the designated space as well as in any other spaces of student housing. On the other hand, whether a space is public or private can be identified based on four identical factors: accessibility, inclusiveness, visibility, and use. Variations in the size and use of such spaces are also found to influence the nature of the different space types.

Keywords: public space, private space, in-between space, student housing

Introduction

One of the most difficult issues in housing design is finding the right balance between public and private space (Neufert, 1980). Scholars argue that public space in student housing is essential for encouraging student interaction. (Gram-Hansen, 2012; Heilweil, 1973; Hsia, 1968; Kenyon, 1999; Van der Ryn & Silverstein, 1967; Whyte, 1985). On the contrary, Van der Ryn and Silverstein (1967) also argue that lack of privacy is a major problem inside the dwelling units of student housing when a student is sharing a room with others. To solve this issue, many students prefer to personalize that means re-arrange their allocable spaces and furniture to create their own privacy (Khajehzadeh & Vale, 2014). Hence, this research aims to define public, private, and the in-between spaces of public and private spaces in the student housing, using the neighborhood scale, building scale, typical floor scale, and the shared unit scale to understand this building type.

Research Methodology

This research is conducted using both qualitative and quantitative methods. Firstly, literature review is conducted from different perspectives or the ways to address the issue by using the qualitative method to establish initial definitions for public, private, and their in-between spaces to analyze selected student housing cases. Space Syntax, applying the quantitative method, is then used to modify the found qualitative analysis results. Finally, the initial definitions of public, private, and in-between spaces are modified according to the student housing analysis results. Details of the methodology are as follows:

• Literature Selection: To understand the dimension of student housing from macro to micro scale, three sets of literature are reviewed, both on the urban and domestic scale, including issues relating to student housing. Although another dimension of publicness or privacy of space created by the virtual world or social media is not taken under consideration to limit the research focus. The first part consists of a literature review of the previous research conducted by Evans (2003) and Aureli (2017) in relation to privacy from the socio-cultural perspective of the domestic spaces. Since the term "public" is most relevant to the urban scale, the second part includes definitions provided by urbanists such as Mehta (2014) and Madanipour (2010). The initial definition of the public, private, and in-between spaces are then derived from these two literature review sets to analyze the selected cases. The final part of the literature review concerns issues of student housing in relation to publicness and privacy of spaces, provided by sociologists and Neufert (1980)

• Case Study Selection: For this research, both international and local cases are analyzed. As the research contains both qualitative and quantitative methodologies, the number of the cases are limited to three international and one local, where the study is being conducted is considered. Since, the place of the research conducted is crucial to visit site physically and identify the evidence of the spaces derived from literature review to conduct the analysis. On the other hand, due to physical inaccessibility, the international cases are selected based on architects' comments in the design brief along with evidence on the existence of public, private, and

in-between spaces from the literature review. Evidence from either formally published drawings and photographs or informal online platforms is taken into consideration for the selection of international cases.

• Analytical Case Methods: Since previous studies relating to privacy include both qualitative and quantitative methods, these are also used in this research to establish definitions for public, private, and in-between spaces. While the qualitative method helps to analyze the case studies using the initial definitions, these are then modified using quantitative data to achieve final definitions directly related to student housing. With the help of Space Syntax via DepthmapX, a computer program, the case studies are then analyzed further to compare the findings and ultimately reach a conclusion.

Literature Review

Part 1: Public and Private Space on the Domestic Scale from the Socio-cultural Perspective: The research conducted by Evans (2003) and Aureli (2017) analyzed the historical evidence on domestic spaces. The main arguments relate to ways in which the publicness and privacy of a space are synthesized into five aspects.

• Enclosure: Aureli (2017) reported that around 12500–9500 B.C., a circular shaped enclosure was created in the Natufian dwelling as the basic unit of the home for shelter or privacy. However, the main private space was considered as the storage spaces in these circular houses rather than having separate rooms for the inhabitants. But, in these circular forms the addition of storage was not efficient as it created more negative spaces. Hence, to solve this issue rectangular forms were introduced where the addition of storage spaces was possible more efficiently.

• Connection: During the Renaissance period, universal rather than separate access was preferred to privacy in the domestic space. In Raphael's painting "Madonna," the figures relate to each other through physical gestures, while of "Villa Madama" was designed to provide access and circulation (Evans, 2003). In contrast, while spaces were inter-connected with no separate rooms for privacy, in Sir John Soane's "Little Study," the most private space which is argued to be study space is located at the corner of the room with an "L-shaped" enclosure created by walls with circulation on the one side. Although the two rooms are connected by this circulation, the privacy is ensured to that study space. (Aureli, 2017).

• Separation: Later, in the premodern era, the segregation of class in the society led to the need for privacy inside the domestic spaces, with servants having restricted access to the domestic realms of the elite (Aureli, 2017). The sub-division of rooms by a corridor to connect the spaces was brought into existence to ensure privacy in each room with only one door serving as both the point of departure and arrival. In Morris's painting "La belle Iseut," unlike Raphael's painting, although each figure is separate, they are still connected without touching each other. Thus, the "Red House" by Morris has separate rooms with a common corridor for circulation or access (Evans, 2003). Moreover, the main corridor acted as a means of separation between the most private spaces such as the bedchamber or study (Aureli, 2017).

• Buffer: While the corridors separated the two most private spaces, it also created a buffer or a transitional space to enhance the privacy of these rooms. Besides, corridors, sometimes a room without any specific purpose, placed in between two private rooms was also used as a buffer. As it created a transitional space to enhance the privacy of the space. The great hall at Coleshill House is a perfect example of such a room without any specific purpose but to act as the buffer increasing the privacy of adjacent rooms. (Aureli, 2017; Evans, 2003).

However, in the student housing, Wu & Ge (2020) argues that common areas connecting public and private spaces acts as the buffer to increase the privacy of the user. As Aravena (2009) and Møller (2016) argued, the common spaces in the student housing are the spaces used for interaction among neighbors inside the building or even the same floors. Depending on its inclusiveness and accessibility (Refer to Part 2), this transitional space can also be termed as "common space."

• Multi-Uses: Moreover, recently, in the early twentieth century, due to a shortage of space, multi-purpose furniture was often used to define the space based on the use of the spaces. For example, the couch could be transformed into a bed found in small New York apartments. Since the use of the bed and couch are different. While the use of bed needs more privacy than the other, a single space can be transformed into various space depending on the use of the furniture placed in that space. Similarly, a single shelve could be used to create a space or enclosure for multi-purposes depending on the user's need. (Aureli, 2017).

Part 2: Definitions of Public and Private Spaces from the Urban Perspective: The term "public" originates from the Latin and refers to the people, indicating a relationship between society and the state (Madanipour, 2010). Moreover, Gove (1976) and Makins (1998) argue that "public" as an adjective, refers to accessible to or shared by all members of the community. According to the literature review from the urban perspective, the definition of a public or private space can ultimately be narrowed down into four categories. Therefore, whether a space is private, or public would depend on its accessibility, to whom it belongs or its inclusiveness, what are its transitional spaces are, and the changes caused by its modified use.

• Accessibility: The publicness of any space, especially from the urban perspective, depends on its accessibility (Jackson, 1974; Birch, 2010; Francis, 1989; Karacor, 2016; Carr et al., 1992; Madden, 2010; Madanipour, 2010; Mehta, 2014). Such access involves two aspects: the individual's ability to reach the space and being able to enter and use it (Mehta, 2014). Physical and social accessibility for all define the publicness of a space (Ercan, 2010).

• Inclusiveness: Ownership of any space determines its inclusiveness, with the elite usually overseeing the design, management, and re-development of public spaces (Madanipour, 2010). This means that every citizen is unlikely to be included, unless it is a civic space or natural urban space such as a river or sea front (Carmona, 2010). Hence, those authorized to participate in potential public space activities will determine how inclusive

that space is. Furthermore, Madden (2010) argued that being "visible and accessible" is the core of publicness. Therefore, visual access is another form of accessibility.

• Ownership: The ownership factor highlights the intermediate realm of public and private spaces, known as a "privatized public space." However, the term 'ownership' often defines terminologies like public, private or even privatized public from the socio-economical perspective in the urban context. For instance, the "public or private sector" may be used to denote the authority overseeing that context (Bilbao, 2018). In terms of space use, Zahrah & Nasution (2011) argues that people continue their social activities in both public and privatized public spaces with physical segregation. However, one of the two primary types of privatized public space is defined as the public space inside gated communities, owned by a group or individual, where access is restricted to a certain group of people as inhabitants of the community (Madanipour, 2010). According to the research by Saalman (1968), another type of space prevailed in medieval European cities and many others around the world. These are the spaces in streets and open spaces inside the city, occupied or privatized by the expansion of houses and private realms to such an extent that only a minimum amount of accessible space remains. For example, the vendors in the urban streets or even the temporary parked cars on the streets or alleys of Bangkok can be considered as the privatized public space as they tend to occupy that space for certain period and once in use others can not access or use it.

• Adaptability: Adaptable spaces as one of the in-between spaces of the public and private spaces are another important aspect of this research. These spaces can often be adapted to act as a type of privatized public space. Unlike "flexibility," "adaptability" is mostly used to refer to capability of holding multi uses in a single space or even refer to those spaces that is undergoing change of use (Groak, 1992). For example, in the student housing, the multi-purpose hall can be considered as an adaptable space as it can hold various types of uses due to the character of the space. Due to its accessibility and inclusiveness, this hall can be considered as a privatized public space first and then adapted to hold multiple functions.

Initial Definitions: In this research, four identical factors are used to identify the public, private, and in-between spaces in the student housing. Following the first two sets of literature review, these factors can be synthesized into accessibility, inclusiveness, visibility, and the uses for the space. Moreover, three major categories of public to private spaces arise from the foregoing discussion on student housing: public spaces, common spaces, and private spaces. Each student housing space can be derived from the terminology and its respective definitions. For example, the entry spaces on the ground floor are considered as a public space, since they are accessible to anyone, while community spaces are common spaces as only the inhabitants can use them. The private spaces are called dwelling units, since their accessibility and inclusiveness are restricted to the users.

However, each of these spaces can be further sub divided into five types: public, common, privatized public, adaptable, and private. For example, the public area on the ground floor includes common, privatized public,

adaptable, and private spaces in terms of accessibility, including visual access and user inclusiveness and use of the space being identified. Similarly, community areas and dwelling units are common, privatized public, adaptable, and private spaces in terms of their inclusiveness and both visual and physical accessibility by the users. However, the publicness or privacy of these public, common, privatized public, adaptable, and private spaces differ when it comes to the building.

Part 3: Student Housing: A secure and well-maintained student housing facility can provide students with privacy, supporting the university recruiting process and attracting highly qualified students (Mansur, 2011; Khaled, 2012; Roche, Flanigan & Copeland, 2010). However, most research on student housing centers on the factors affecting resident satisfaction, such as the adaptability of students toward the living style and their assessment of the housing quality (Amole, 2012). The issues as well as the characteristics of student housing spaces in relation to private and public spaces are discussed briefly below:

From the sociological perspective, gender and previous home experience are among the factors influencing satisfaction in student housing due to their relationship with the issue of privacy. Regarding gender, the size or the area of the space is the most important aspect for consideration. Females tend to prefer living in shared facilities (Amole, 2005), while males prefer a smaller room and crowded spaces (Kaya & Erkip, 2001). However, Holland et al. (2007) argued that students' social spaces tend to be either fully isolated or quiet spaces with enhanced privacy. In terms of previous home experience, scholars argue that the fewer the people sharing a unit, the higher the level of satisfaction and ultimately providing the opportunity of interaction among them. (Kaya & Erkip, 2001; Amole, 2009; Martin & Allen, 2009; Wiens, 2010; Roche Flanigan & Copeland, 2010). Furthermore, noisy housemates (43%), housemates stealing food (29%), and break-ins or burglaries (6%) can be considered as common issues relating to privacy and security (Murray, 2020). Neufert (1980) suggests that furniture such as shelves could be placed along the shared wall to buffer the noise and ensure privacy.

Quantitative Analysis: DepthmapX program of Space Syntax is used for quantitative analysis of the case studies. According to Turner (2001), visibility should be considered from the perspective of the viewer's height, to analyze the accessibility of the space. According to depthmapX, the main argument is that most connected spaces are easily accessible and thus more public. Depending on the scale of the single line drawings provided with doors as the opening or the means of access, depthmapX generate its own grid, based on which it runs the analysis to identify the most connected spaces, which is denoted as the public space in this research. It is represented by connectivity and isovist analysis with color coding, where red denotes the most connected spaces to the blue as the least connected spaces. In the pasts, Alitajer & Nojoumi (2016) and Zerouati & Bellal (2020) used comparable arguments and depthmapX to analyze housing spaces, providing a similar research outcome to this study.

Analysis and Discussion

In this paper, the process of analysis is explained through one space of one of the international cases, despite having all the case studies included in the final research findings and conclusion section. The analytical process and findings in relation to the international case study on iHouse Dormitory, designed by Studio SUMO, are discussed below:

iHouse Dormitory by Studio SUMO, Togane, Japan, 2016: This project is home to 140 students and was selected because the photographs and drawings provide evidence of privatized public space and adaptability for the analysis. In this project, the ground floor is used for most public activities and thus can be denoted as the public space. The ground floor includes some shared functions and hence those spaces can be termed as the common space, while the dwelling units are the most private spaces of ground floor or the public space of this project.

Ground Floor or Public Space in the iHouse Dormitory by Studio SUMO: The ground floor or public space of the project can be considered as the plaza in terms of accessibility and inclusiveness since it connects the two wings of the building, also acting as a buffer. In terms of common spaces or the space that is accessible by the students only, all the circulation including the lift, stairs and passages can be considered due to the inclusiveness of the students. After analyzing the public space of this project using both qualitative and quantitative methods, several characteristics of the public, private and in-between spaces are evident. For example, in terms of the activity room that is located next to the residential units, noise is an issue and hampers privacy. Again, despite being common in nature, this activity room is less accessible from the entrance, creating privacy.

However, a contradiction to the qualitative and quantitative analysis is also found. For example, in terms of plaza, according to the qualitative analysis, it can be considered as the most public space in this project, whereas according to the quantitative analysis, the most public space is the corridor of the ground floor that passes through the plaza connecting the two wings.

Besides, to create a buffer from the plaza to the terrace of the exhibition space, landscaping is used, which is considered as an ambiguous space in this research and not included in the initial definition of public, private, and the in-between spaces as it is neither accessible nor it has any specific use. However, the results of the quantitative analysis provide evidence that there are various levels of accessibility in each of these spaces, with the more accessible or connected spaces like the corridor and plaza being more public in nature. However, the following Fig 1 shows the findings achieved when both the qualitative and quantitative analysis are compared together denoting, red as the most public to the blue as the most private spaces on the ground floor or public space of this project.
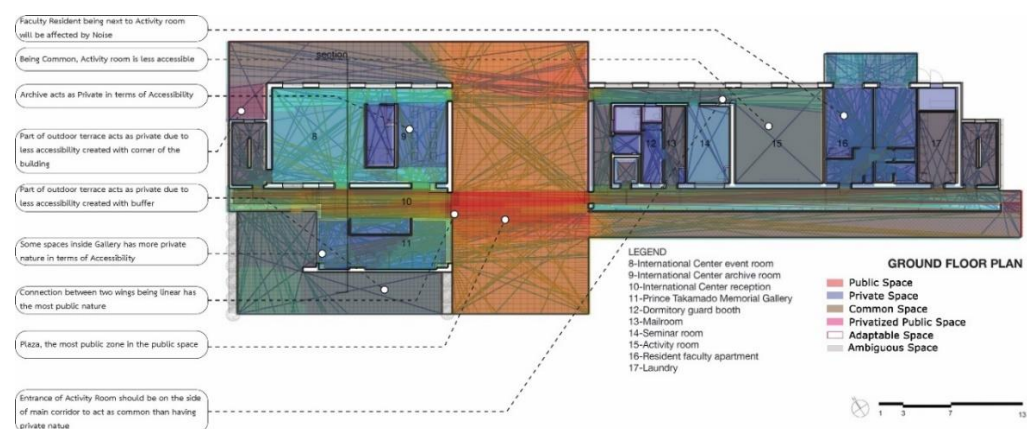
Fig 1: Qualitative and quantitative analysis of the public spaces in the iHouse Dormitory

Summary Analysis of All Case Studies

Following the above-mentioned analytical methods, the remaining cases are compared to conclude the final research findings. In table 1, following the color code the qualitative and quantitative analysis are shown while table 2 discusses the brief findings of each analysis shown in the table 1.

Table 1: Results of Case studies conducted.

Table 2: Comparison of cases according to the qualitative and quantitative analysis findings

Case	Space Type	Location/Use	Qualitative Analysis	Qualitative & Quantitative Analysis
iHouse Dormitory (International)	1-3. Public Space 4-5. Common Space	1. Plaza, 2. Activity Room, 3. Exhibition. 4. Kitchen Terrace, 5. Circulation (Corridor)	1. Acts as public space. 2. Located adjacent to residence with lack of buffer. 3. Private by nature. 4. (1) Common by nature. (2) Extension of seating makes the space adaptable. 5. Common by nature; pocket space along the corridor is privatized public.	1. Space connecting two wings is more public. 2. Despite being common, space is in a less accessible zone. 3. The space closer to the plaza is more public. 4. (1) The space closer to the entry is more public. (2) Adaptable space is in a less accessible zone. 5. Corridors connecting units and transitional area from the common room to terrace is more public.
Edmund Hunt Hall (International)	1-3. Public Space 4-5. Common Space	1. Seating, 2. Multi-purpose Hall, 3. Service. 4. Dining 5. Study	1. Privatized public space by nature. 2. Privatized public space, also adaptable space. 3&5. Private space by nature. 4. Common space by nature.	1. Located in the least accessible zone. 2. Alignment and size of doors gives it a more privatized public nature. 3&5. Located in a less accessible space. 4. Small, clustered study space has more privacy.
Campus Hall (International)	1-3. Public Space 4. Common Space	1. Parking, 2. Lobby, 3. Lounge. 4. Buffer (In front of Units)	1. Privatized public space by nature. 2&3. Common space by nature. 4. Alcove at unit entrance and space behind core acts as a privatized public space; buffer space.	1. Located in the least accessible space in the plaza. 2. Space near entrance is more public. 3. Central circulation is more public. 4. Alcove at unit entrance & space behind core is less accessible space; has more privacy.
CU iHouse (Local)	1-3. Public Space 4-5. Common Space	1. Lobby, 2. Seating, 3. Drop off. 4. Lift Lobby 5. Study Space and Seating	1. Common space by nature 2. Often buffered by ambiguous space (landscaping) 3. Public space by nature 4. Common space by nature. 5. Privatized public space inside common space by nature.	1& 2. Located in the least accessible zone with more privacy. 3 More accessible public than the plaza 4 Located in a less accessible space with privacy. 5 Less accessible space with privacy is preferred by inhabitants.

Research Findings and Discussion

The findings of this research reveal that the initial definitions for public, private, and in-between spaces were incomplete and needed modification, as evidenced by the analysis. Due to the complex nature of student housing and their ability to reside together in the various space types, it is often difficult to identify whether a space is public or private. However, with the use of four derived factors, namely accessibility, inclusiveness,

visibility, and the use of space, the publicness or privacy of the space inside the student housing project can be defined. The findings can be categorized into six major points as discussed below:

<u>Public and Private Space Coincide Together</u>: As per the initial definition, it can be seen from the cases that in student housing, public to private spaces reside together depending on their accessibility, inclusiveness, visibility, and use. Privatized public space, adaptable space, and common space are the in-between spaces of public to private spaces.

<u>Public and Private Space Needs a Buffer to Increase the Privacy or Publicness of the Space</u>: To define public to private space in student housing, buffers are often used as observed in the literature review and can also involve other spaces and building types. These buffers can consist of landscaping or ambiguous spaces, privatized public space or common space in terms of student housing. The types of buffer found in previous research consist of landscaping, circulation, and single spaces connecting private to public spaces.

<u>Levels of Publicness or Privacy are Prevalent in the Spaces</u>: According to the quantitative analysis, several levels of accessibility can be found in student housing. Due to this variation in levels, some spaces are more accessible making them public and vice-versa.

<u>Multiple Definitions Can Be Applied to a Single Space Depending on Its Use</u>: Several spaces inside the student housing demonstrate that multiple definitions can be applied to a single space. For example, seating in a common space inside student housing is initially "common" depending on its inclusiveness, then "privatized public," depending on accessibility and use.

<u>Adaptability Depending on the Use Also Defines the Public or Private Nature of the Space</u>: In student housing, adaptable spaces are often found to be initially "common," then "privatized public" and finally becoming "adaptable" because of its new use.

<u>Contradictions Between Qualitative and Quantitative Methods</u>: Some contradictions exist when qualitative and quantitative methods are used together in the analysis of student housing. For example, vertical circulation is "common" based on inclusiveness, but quantitative analysis shows it to be "private" because of the location and size of the space. Since quantitative analysis mainly involves one factor, namely accessibility, other factors can be used to address this contradiction.
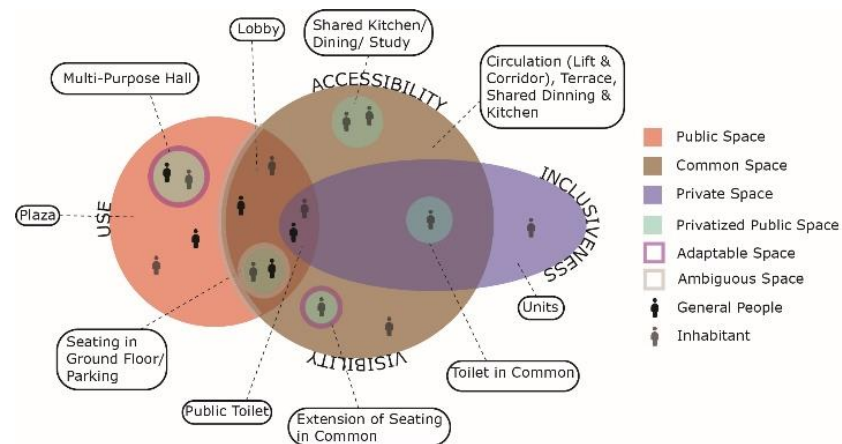
Fig 2: Modified definitions for public, private, and in-between spaces in student housing

Conclusion and Scope for Further Study: From this research, it is evident that the public, private, and in-between spaces in student housing can be identified using four factors: accessibility, inclusiveness, visibility, and use. These factors are mentioned separately by scholars as evidenced by the literature review. To identify the publicness of space in student housing, it is important to combine all the four factors. With the help of these factors, student housing spaces can be designed with sufficient privacy and publicness required which will ultimately create social interaction among the users. Furthermore, previous studies lack the presence of ambiguous or landscaping spaces, especially in the public or common spaces which are often used as buffers between public to private spaces in student housing as evidenced by this research. However, each of these private, public, and in-between spaces are different when justified using all the derived factors. However, due to the limitations of depthmapX software, the issue of visibility or transparency could not be analyzed in this research. In future, the upcoming DepthSpace3D software could be used to analyze these characteristics since it provides 3D images of the space rather than only 2D. Besides, in terms of visibility, another dimension of public and private space created by social media, or the virtual realm, is left undiscovered in this research.

References

Alitajer S. & Nojoumi G. M. (2016). Privacy at home: Analysis of behavioral patterns in the spatial configuration of traditional and modern houses in the city of Hamedan based on the notion of space syntax. *Frontiers of Architectural Research, 5*(3), 341-352. doi: http://dx.doi.org/10.1016/j.foar.2016.02.003

Amole, D. (2005). Coping strategies for living in student residential facilities in Nigeria. *Environment and Behavior, 37*, 201–219.

Amole, D. (2009). Residential satisfaction in students' housing. *Journal of Environmental Psychology, 29*, 76–85.

Amole, D. (2012). Gender differences in user response to students housing. *Procedia-Social and Behavioral Sciences, 38*, 89–99.

Aravena, A. (2009). *St Edward's University new residence and dining hall.* Retrieved from https://www.archdaily.com/31771/st-edwards-university-new-residence-and-dining-hall-alejandro-aravena

Aureli, P. V. (2017). *The room of one's own.* Milan: Princeton.

Bilbao, T. (2018). *A house is not just a house: Projects on housing.* New York: Columbia Books on Architecture and The City.

Birch, E. L. (2010). *Public and private space in urban areas: House, neighborhood, and city.* Retrieved from www.ResearchGate.net/publication/226509332

Brighenti, A. (2010). *The publicness of public space: On the public domain.* Trento: Quaderni del Dipartimento di Sociologia e Ricerca Sociale, Università di Trento.

Carmona, M. (2010, February). Contemporary public spacwe: Critique and classification, part one: Critique. *Journal of Urban Design, 15*(1), 123-148. doi 10.1080/13574800903435651

Carr, S., Francis, M., Rivlin, L. G. & Stone, A. M. (1992). *Public space.* New York: Cambridge University Press.

Ercan, M. A. (2010). Less public than before? In A. Madanipour (Ed.), *Whose public space?* London; New York: Routledge.

Evans, R. (2003). Figures, doors and passages. In *Translations from drawing to building and other essays.* London: Architectural Association.

Francis, M. (1989). Control as a dimension of public-space quality. In I. Altman and E. Zube (eds.), *Public places*

and spaces. New York: Plenum Press.

Gove, P. B. (Ed.). (1976). *Webster's third new international dictionary.* Chicago: Encyclopedia Britannica.

Gram-Hansen, R. (2012). *Circular dormitories between city and private life: A comparative study of two iconic student halls in Copenhagen and Vienna.* (Master's thesis, University of Copenhagen, Copenhagen).

Groak, S. (1992). *The idea of building: Thought and action in the design and production of buildings.* London: E & FN Spon.

Heilweil, M. (1973). The influence of dormitory architecture on resident behavior. *Environment and Behavior, 5,* 377–412.

Holland, C., Clark, A., Katz, J., & Peace, S. (2007). *Social interactions in urban public places.* Bristol: Policy Press.

Hsia, V. W. (1968). *Residence hall environment: A comparative study in architectural psychology.* (Master's thesis, University of Utah (Salt Lake City)).

Jackson, J. (1974). American public space. The Public Interest, 74(Winter): 52–65.

Karacor, E. K. (2016). Public vs. private: The evaluation of different space types in terms of publicness dimension. *European Journal of Sustainable Development, 5,* 51-58. doi:10.14207/ejsd. 2016.v5n3p51

Kaya, N. & Erkip, NF. (2001). Satisfaction in a dormitory building: The effects of floor height on the perception of room size and crowding. *Environment and Behavior,* 35–53.

Kenyon, E. L. (Ed.). (1999). *A home from home: Student's transitional experience of home.* London: Routledge.

Khajehzadeh, I. & Vale, B. (2014). *Shared spaces in a student dorm.* Paper presented at the 48th International Conference of the Architectural Science Association & Geneva University Press.

Khaled, M. (2012). 35 IPT diiktiraf cemerlang/*Interviewer*: R. M. Ruzki.

Madanipour, A. (2010). *Whose public space? International case studies in urban design and development.* Philadelphia: Routledge.

Madden, D. J. (2010). Revisiting the end of public space: Assembling the public in an urban park. *City & Community, 9*(2), 187–207.

Makins, M. (Ed.). (1998). *Collins concise dictionary.* Glasgow: HarperCollins.

Mansur, K. (2011) Mapum utamakan kualiti kolej kediaman universiti/*Interviewer*: I. A. JS. Kota Kinabalu: New Sabah Times.

Martin, J & Allen, M. (2009). Students in my backyard: Housing at the campus edge and other emerging trends in residential development. *Planning for Higher Education*, 34–43.

Mehta, V. (2014). Evaluating public space. *Journal of Urban Design, 19*, 53-88. doi: http://dx.doi.org/10.1080/13574809.2013.854698

Møller, C. F. (2016). *Student housing*. Retrieved from https://www.archdaily.com/785806/student-housing-cf-moller

Murray, J. (2020). Top 10 Student Housing Problems Revealed. savethestudent.org/accommodation

Neufert, E. (1980). *Architect's data* (Second (International) English Edition). London: Blackwell Science.

Roche C. R., Flanigan M. A., & Copeland Jnr. P. K. (2010, June 7–10). *Student housing: Trends, preferences and needs.* Paper presented at the 2010 EABR & ETLC Conference, Dublin, Ireland.

Saalman, H. (1968). *Medieval cities.* London: Studio Vista.

Turner, A. (2001). *A program to perform visibility graph analysis.* Paper presented at the Third International Space Syntax Symposium, Atlanta, USA.

Van Der Ryn, S. & Silverstein, M. (1967). *Dorms at Berkley: And environmental analysis.* New York: Educational Facilities Laboratories.

Wiens, J. (2010). Future evolution. *College Planning and Management, 13*, 32–38.

Whyte, William H. (1985). *The social life of small urban spaces.* Washington, DC: The Conservation.

Wu, Wenyuan & Ge, X. J. (2020). Communal space design of high-rise apartments: A literature review. *Journal of Design and Built Environment, 20*, 35–49.

Zahrah, W. & Nasution, A. D. (2011). *Public open space privatization and quality of life, case study Merdeka Square Medan.* Paper presented at the ASEAN Conference on Environment-Behavior Studies, Savoy Homann Bidakara Bandung Hotel, Bandung, Indonesia.

Zerouati, W. & Bellal, T. (2020). Evaluating the impact of mass housings' in-between spaces' spatial configuration on users' social interaction. *Frontiers of Architectural Research, 9*, 34–53.