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Housing Activities in Contemporary Indonesian Dwellings

인도네시아 현대주거의 거주행위에 관한 연구

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Abstract

Activities in the dwelling are inseparable from housing design. Spatial features often result from patterns of activities that take place within the dwelling. Activities are further elaborated to affect house plans, furniture, arrangement, and equipment. However, discrepancies still exist between housing design and behavior, where housing design often fails to accommodate activities and behavioral dimensions within the family and the dwelling. This paper addresses the relationship between dwelling activities and housing design by means of a qualitative study that aims to understand the needs of the Indonesian dwelling through activity analysis. To do so, the research adopts a methodology that involves collecting data from measurements of the house, house plan analysis, and photographs, in addition to in-depth semi-structured interviews with families. Taking Bandung as a case study, 9 houses and families were selected as respondents that share similar family life-cycles, number of family members, and building size. The findings from the study suggest that spacious and open plans are preferred by the family, while maintaining family privacy. Guest areas are used to host formal guests and to restrict visitor access in the house. Service areas such as kitchens and laundry areas are the core areas for household activities for cooking, laundry, and drying. To meet social activities such as community gathering, open plan design is necessary to allow flexibility of furniture reconfiguration to accommodate extra guests.

Keywords : Housing Activity, Housing Behavior, Housing Design, Bandung, Indonesia
주 요 어 : 거주활동, 거주행위, 주택디자인, 반둥, 인도네시아

I. Introduction

1. Background and aims of the study

Although housing is perceived as a physical entity, it is a social institution and can be understood as a basic cultural phenomenon (Altman & Chemers, 1980). Housing culture came into being as a result of how lifestyles characterize a society in relation to the forms and spaces of diverse places inhabited by humans, and therefore housing can be understood as a physical expression of housing culture (Kang & Han, 2000).

The components of housing culture can be classified into internal factors and external factors. Invisible values such as world views and value systems are internal factors. Behavior, which manifests itself as human actions, and physical spaces, or characteristics that are displayed, are external factors. Internal values prompt humans to select the forms of spaces, and forms in turn affect human values. Human behavior is restricted in spaces, and in turn human behavior regulates spaces. Human internal values determine activities, and the results of activities shape values. These three components, ‘space’, ‘behavior’, and ‘value’ are shaped by affecting one another in bilateral or trilateral relationships and change ceaselessly.

Therefore, for analysis of housing culture, emphasis must be placed on the interrelationships among cultural elements rather than on the analysis of fragmentary cultural elements.

Transcending the traditional view of housing culture as an object of vague totality, this study builds on the analytical approach that culture consists of the relations between “space-value-behavior”, where the interrelations among these elements can formulate the conceptual framework of “housing space-housing activities-housing consciousness”. This study attempts to understand and analyze housing culture systematically through this conceptual framework <Figure 1>.

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이 논문은 2016년도 정부(교육과학기술부)의 재원으로 한국연구재단의 지원을 받아 수행된 연구임(NRF-2016R1A2B2010247).

The present study is one of author's series of studies on housing culture in Southeast Asia. While earlier studies focused on understanding the general forms of Indonesian housing provided by housing suppliers, this study focuses on housing activities, which belong to the second stage in the conceptual framework of housing culture, and focuses on grasping the interrelation between space and behavior.

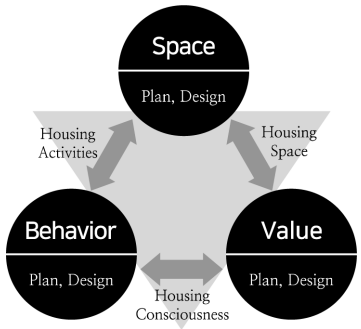


Figure 1. Conceptual Framework of Culture
Source. Ju & Kim (2014, p 112)

Under the ultimate goal to understand the uniqueness of Indonesian housing culture, this study aims to address the basic housing activities as well as the housing needs of in Indonesian residents.

It is anticipated that the study can offer insight to housing developers and designers to design houses that can be best fitted to residents' living patterns and needs. In addition, it is expected that the systematic framework for analyzing housing culture that is established based on the results of this study provides a useful comparative tool for grasping the commonalities and differences of housing cultures in Southeast Asia.

2. Research scope and methodology

This study is one of the first studies to investigate housing behavior in Indonesia, as the general formal patterns of houses have not been yet clearly analyzed.

The methodology of this study is ethnography field work, in which small number of cases were analyzed through in-depth qualitative analysis. We also conducted questionnaire survey to derive similar questions for each house. We measured the houses to obtain the current plans of the houses, observed the residents' daily lives, took photographs of the interior space, and conducted in-depth interviews with the residents based on semi-structured questionnaires.

This study analyzed 9 houses in Bandung[1)]. In order to select the 9 houses, we surveyed 22 houses[2)] during February 2016.

We aimed to understand the general housing behavior as a first step, so we focused on typical middle-class[3)] urban Indonesian families. From the 22 house surveyed, we finally selected 9 cases for this study, which were similar in house size[4)], number and stage of families and years of living.

3. Theoretical review

1) Housing lifestyle

The researches on housing culture has hitherto centered on housing lifestyles. Referring to regular patterns in everyday life, or daily life patterns, that are practiced with a focus on housing, housing lifestyles consist of the state of traditions and habituated everyday behavior in housing activities. They differ according to the family composition, social class, regional climate, and topographical conditions and constantly change according to changes with the passage of time as well.

Lifestyles have been considered as important causes

1) Bandung is one of the major cities in Indonesia, and the capital of the West Java province. Bandung Metropolitan Area is the second most populated metropolitan area in Indonesia with the population of 7,889,047 people (Hapsariniaty et al., 2013). Bandung was also renowned as "the ideal residential town" in its initial development during the 1920s. Today, more than 50% of land use in Bandung is for residential areas (Hilman, 2004) and housing developments in Bandung are still growing, where consumers prefer landed housing property instead of elevated/vertical housing property (Ilhamdaniah, 2011).

2) This research began by summarizing housing development in Bandung into several phases. Based on author's precedent study (Putra & Ju, 2016), housing developments in Bandung were classified according to political epochs as follows;
Colonial Period: Ethical Policy (1901-1942)
Early Post-Independence Era: Old Regime (1945-1966)
Late Post-Independence Era: New Regime (1966-1998)
Post Reformation Era (1998-present)
This study focus on late post-independence era and post reformation era, then select representative housing complex projects by the era, then select the cases per each housing complexes selected.

3) In Indonesia, middle class is defined by Asian Development Bank criteria which is population with daily per capita expenditure between $ 2-20 per day. Using this criteria, Indonesia's middle class has increased rapidly, in 1999 the number of Indonesia's middle class was around 25 millions (25% of population) while in 2010 was estimated around 146 million (57% of population). Consuming class is individuals with net income of $ 3,600 (Salim, 2012)
Unfortunately we could not investigate the residents' incomes because they hesitated to answer. Instead, we judged the middle class houses depending on local housing experts' advice.

4) The guideline to classify the house by size is not clear in Indonesia. Based on the table below, the ranges of basic and small types are not wide and detail, while the ranges of luxury types are too wide (over 70 m^2).
Based on author's precedent study (Megawati et al., 2014), the units in the new town in Bandung, Kota Baru Parahyangan, are categorized into three groups; (1) Small size unit types (50-70 m^2) (2) Medium size unit types (70-200 m^2) (3) Large size unit type (over 200 m^2)
According to this research, the houses we selected for this study are all luxury type that ranges 132-201 m^2 in size, which can be classified as middle size among luxury type.

bringing about differences in housing forms among disparate cultural spheres or regions (Lawrence, 1982, 1990; Rapoport, 1969).

Housing activity styles have been diversely defined according to the researcher, as “housing styles”, “lifestyles”, “housing activity styles”, and “housing lifestyles”. When precedent researches are synthesized, studies on housing activity styles are largely divided into three topics (Mo et al., 2013):

First, housing values, which center on users’ demands, opinions, and awareness;

Second, housing spaces, which concern the housing space organization and the types of furniture and equipments used inside housing;

Third, housing activities, which address how humans habitually use and behave in housing spaces.

2) Housing activities

Activities in the dwelling are seen as inseparable attributes in the meaning of a house (Meesters, 2009). Hematalikeikha and Alinaghizadeh (2012) demonstrate that spatial design in a house reflects its activities, which is produced by the society as an implication of social interaction. The house is defined as the system of settings that affords certain systems of functions, which is comprised of the activity system (Coolen & Meesters, 2012). In this regard, we understand that spatial features result from patterns of activities that take place within spatial boundaries.

Housing activity surveys consist of examining the ways in which humans use spaces or their space use methods, with a focus on their everyday activities performed inside the house. Through housing activities, it is possible to grasp the subjects who perform the activities (humans), spaces in which the activities are performed, times and durations at which the activities are performed, and material conditions that are necessary for the activities (furnishings, appliances, etc.), all of which are unique for each culture. The types and degree of activities that are performed in each space within the house can be understood, as well as the degree of the functional division of spaces, nature of spaces, and the meanings of activities.

Table 1. *Indonesian Housing Classification Guidelines*

Housing Type			Building Area
Non-Commercial Housing	Basic Types		18-21 m^2
			27-36 m^2
	Small Types		45 m^2-54 sqm
Commercial Housing	Luxury Types	Lower-end	70-150 m^2
		Higher-end	<400 m^2

Source. Belgawan, 2011

Housing behavior can be generally classified into 1) sleeping and rest, 2) dining, 3) family gathering, 4) housekeeping, 5) nursing and education, 6) bathing, 7) hosting guest, and 8) cooking & utility (Yim et al., 2000; Park, 2001). These classifications were further elaborated in this study by considering the Indonesian culture into 7 activities; family gathering, hosting guest, sleeping, personal activity, bathing, cooking & utility and holding events. We observed behavior within the dwelling according to this classification.

The 7 activities were discussed in broader 4 groups as family activities, social activities, personnel activities and service activities in this study.

3) Understanding of traditional Javanese houses

Indonesia is an archipelago country and it consists of diverse ethnic groups. Among its islands, Java is the largest and has the greatest population.

The basic form of a Javanese traditional house consists of single-story, primary buildings and several auxiliary buildings which have specific character and symbolic meanings as well as the inherent spatial functions, all located within a walled compound. The primary buildings are the *pendhapa*, *pringgitan*, and *dalem*, which are located along the north-south axis in the center, whereas auxiliary buildings such as the *mburi omah* and *gandok* are located to the left and right of the primary buildings.

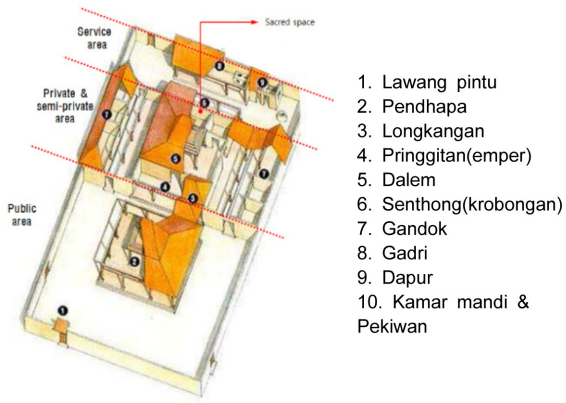


Figure 2. *A Typical Layout of Javanese House*
Source. Tjahjono (1998, p. 35)

The *pendhapa*, located at the front, is an open building without walls, serves to receive visitors. This space is also used for public meetings or for communal prayers and meals that take place at public ceremonies. The *pringgitan*, located between the *dalem* and the *pendhapa*, is a semi-open building where wayang kulit performances take place during weddings, circumcisions, and special events. It is an in-between space where a transition from public space to private space takes place.

The *dalem* represents the backside of the house, consisting of a building that is closed on all four sides with walls. It is the main building which functions as the family living space. Within the *dalem*, three *senthongs* are located. The *senthongs* situated to the left and right are typically used as bedrooms for family members. The central senthong is the most private of spaces, a sacred and holy place where Dewi Sriis worshiped.

The *gandok*, located to the left and right of the *dalem*, is a daily living space where family members eat and sleep together and meet close friends and neighbors. The left *gandhok* is used for male bedrooms while the right *gandhok* is used for female bedrooms.

Mburi omah refers to a service space such as the *dapur* (kitchen), *kamar mandi* (toilet) *pekiwan* (bathroom), which are considered to be unclean spaces. These are usually located behind the *dalem*, as far away as possible from the holy place of the house.

As such, the gradual transition from public space to private space align with the movement from outside to inside. Dualism between public/private, male/female, open/closed, light/dark, and front/back is key characteristic of Javanese houses.

II. Objects of the Study

As mentioned above, our target of study was typical middle-class urban Indonesian families. The composition of the family is husband, wife and 2 or 3 children. The ages of husbands ranged from 48 to 61, while the ages of children ranged from 14 to 33. They had occupied the house for at least 19 years, and at most 31 years <Table 2>. From the 9 families, most wives (6 families) work in the public sector and private sector, and one of them is a teacher.

All houses were double-story houses, and building size ranged from 132 to 201 m^2 <Table 3>. The ranges of house size are wide but they can be classified as medium size according to Indonesian practice. The oldest house was built in 1985, while the newest was built in 1997.

III. Analysis of Activities

1. Family activities

The living room is the center for family activities. Watching television while chatting with the family members are the main activities done in the living room. In all cases, family gatherings were done during night time only. It was due that he majority of cases in this study (6 cases) were dual-income family.

As shown in all cases, the living rooms were furnished with a sofa or comfort chair for seating. Carpets covered the ceramic tile floor to give a sense of warmth in the living room. The coffee table was rarely set up at the center of the room, but rather placed at the side not to obstructed to watch view. It was however needed to place food, snacks, and books <Figure 3>. The living rooms were located on the first floor. In KP01, there were two living rooms on both first floor and the second floor. They frequently enjoyed their living activities in the second floor as it was more spacious, thus it could accommodate more furniture.

As a result of analyzing the interrelationship between the dining room and living room, they were designed as an open space in 3 cases (PB03, KP01, KP03). In the other cases, they were separated by walls, but located next to each other <Table 4>.

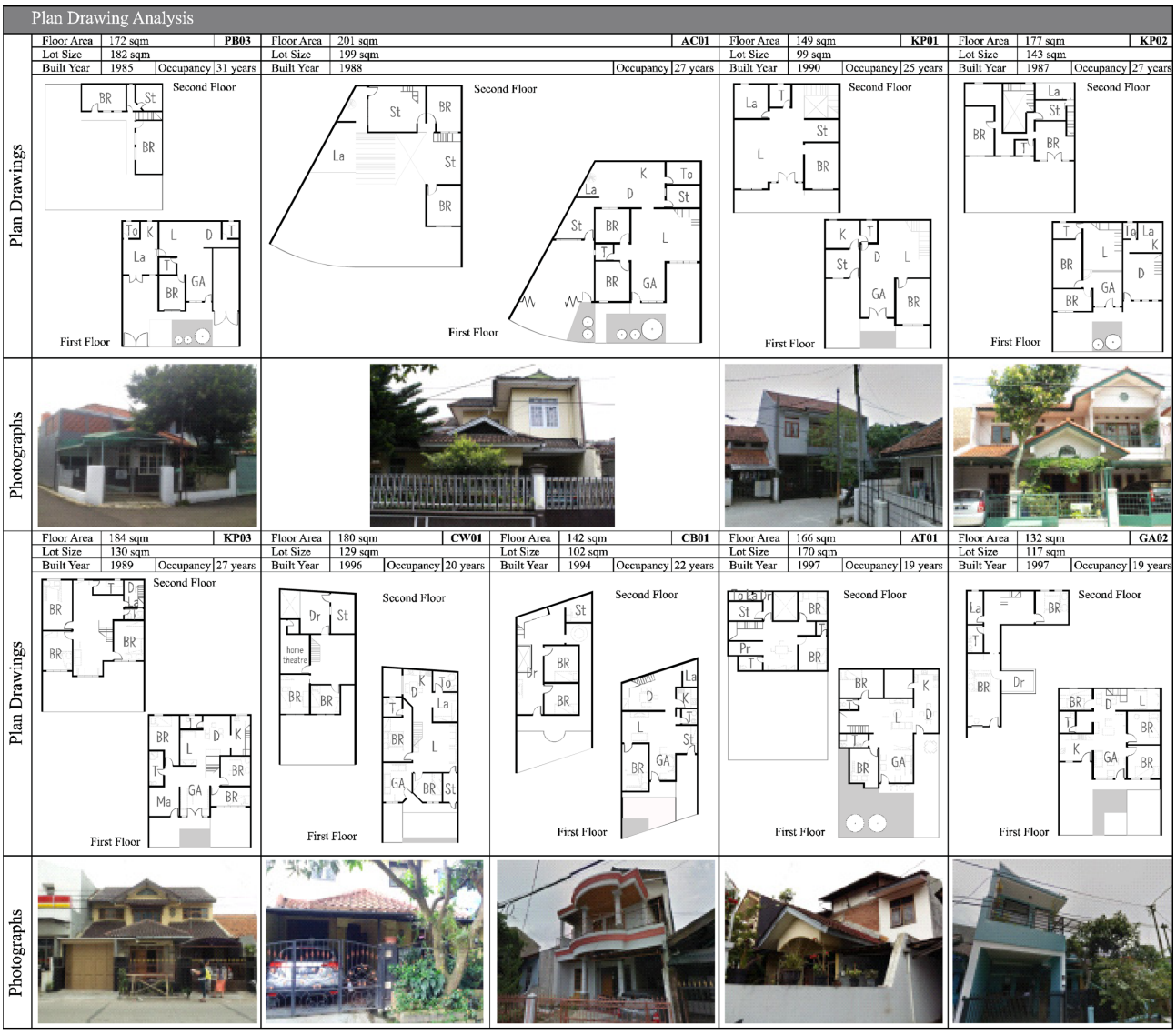
Although separate dining rooms existed, the dining activity did not necessarily take place in the dining rooms in five cases (CW01, PB03, KP02, AT01, and AC01). Instead the family had their dinner in the living room. They explained that they prefer watching television while having their meals (KP02 and

Table 2. *General Overview of Objects of Study*

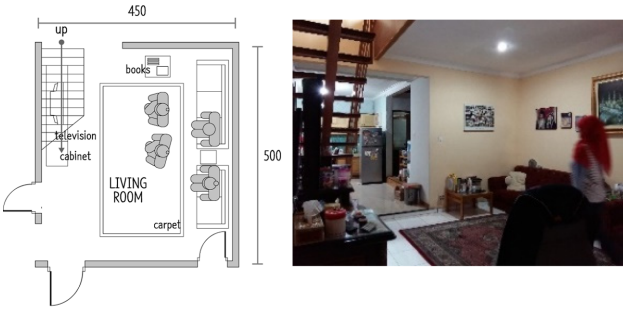
Case	Building Size (m^2)		Building Information		Husband		Wife		Children
	Floor Area	Lot Size	Built Year	Occupancy Years	Age	Occupation	Age	Occupation	Age
PB03	172	182	1985	31	50	PS	47	Housewife	(M) 23, (M) 19
AC01	201	199	1988	27	53	ENT	53	Housewife	(F) 26, (F) 24, (F) 18
KP01	149	99	1990	25	54	PS	53	Public	(F) 28*, (F) 25
KP02	177	143	1987	27	61	PS	57	Public	(M) 29, (F) 25
KP03	184	130	1989	27	58	PS	56	Public	(M) 33*, (M) 31*, (M) 18
CW01	180	129	1996	20	53	PS	49	Housewife	22, 20
CB01	142	102	1994	22	58	ENT	56	Teacher	(M) 28*, (M) 24, (F) 22
AT01	166	170	1997	19	50	PE	48	Private	(F) 22, (M) 18, (F) 15
GA02	132	117	1997	19	48	PS	47	Public	(M) 22, (F) 20, (M) 14

Abbreviations: PS=Public Service, PE=Private Employee, and ENT=Entrepreneur
District Abbreviations: PB=Pondok Bentang Asri, AC=Arcamanik, KP=Kopo, CW=Ciwastra, CB=Cibiru, AT=Antapani GA=Gempol Asri
*these children have departed from their parent't home.

Table 3. *House Plan Analysis*



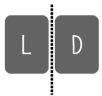
Abbreviations: GA=Guest Area, L=Living Room, D= Dining, K=Kitchen, BR=Bedroom, T=Bathroom/Toilet, To=Service Toilet, La=Laundry, Dr=Drying, St=Storage, and Ma=Multipurpose Room.



a) *Interior layout* b) *Photograph of the living room facing the sofa (CW01)*

Figure 3. *Living Room Layout*

Table 4. *The Space Relations between L/D*

L/D Relations	
	
PB03, KP01, KP03	KP02, AT01, GA02, AC01, CW01, CB01
a) *closely related without any physical barrier*	b) *separated by wall*

AT01)[5]. The Other (CW01) mentioned that having their dinner in the living room could increase intimacy among the family members[6].

5) It is explained by family in AC01:
"*We dine at dining room only during the fasting month of Ramadhan. Usually we just dine here (in the living room)... Yes, while watching the television*".

2. Social activities

As mentioned above, in Indonesian houses, separation between public space and private space is one of key characteristics. The guest ares is a transitional space from the public to private zone. It mainly serves to host guests, particularly for formal guests who are not close to the family. The guest area is the place to show hospitality to the guest, and therefore guest areas in all cases are well-decorated, formally arranged, and less messy than other parts of the house.

All interviewees pointed out that guest areas were dedicated for formal guests only. Relatives and close friends were hosted in the living room or dining room. They also differentiate the entrances; formal guests enter the house from the front entrance, while close friends and relatives enter the house from the side entrances which are located at the car park spaces.

As a result of analyzing the interrelationship between the living room and guest area, they were planned as one open space in most of houses (6 cases). In <Table 5>, (a) shows cases where no physical barrier was present. In (b), furnitures separates the room, It indicates that despite they were designed an open plan configuration, they still desire separation between two spaces. privacy by other means. Separation by rigid structure such as wall is avoided as it can cause the cramped space.

Table 5. *The Space Relations between GA/L*

GA/L Relations		
Open Connectivity		Wall Separation
L / GA	L / GA	L / GA
PB03, AC01, KP01, CB01	KP02, AT01	KP03, CW01, GA02
a) *linearly aligned*	b) *separated by high cabinet*	c) *separated by walls*
Less Private		**More Private**

In (c), KP03, CW01 and GA02, the families put privacy as their concern to separate the guest area and living room. The family of CW01 switched the location of the guest area and bedroom during renovation to achieve more privacy <Figure 4>.

a) *original plan* b) *renovated plan*

Figure 4. *Transformation of GA/L Space (CW01)*

Praying is essentially a routine activity for Muslim families, because it is obligatory for them to pray five times a day. The living room is transformed to a praying space during prayer times, as it is spacious enough to pray together with all family members. When they pray, chairs and tables are moved aside, while putting a praying mat for the prayer activity. But usually men in the family pray at the mosque instead of the house. When only the wife and their children pray in the house, they usually pray in their own bedrooms.

Traditionally, Indonesian hold various events in the house, such as religious celebrations (Eid Al-fitr and Eid Al-Adha[7]), weddings, births, baby showers, birthdays, mourning for family loss, and social/community gathering (arisan[8]). In these days however, particularly in urban areas, events such as weddings and birthdays are normally held outside. Religious celebrations were celebrated at the parents' house located in their hometown. Community gatherings still take place inside the house. In the event called arisan, community people gather in one of their members' house to bond social ties. Around 15-30 people attend at this event. The house was chosen by taking turns, regularly held at one house every month.

When the arisan took place in their houses, they needed to move the furniture out from the living room and make space for seating and lay a carpet on the floor. People prefer to sit cross-legged instead of sitting on the chairs.

There are several ways to make space for holding this kind of event. In most cases, they moved the furniture, including chairs and tables, to the edge of the room. They lay carpets or bamboo mats in the center of the space to provide seating for the visitors. Food and drinks are usually set up in the center of the carpet to complement the event <Figure 5>. In some

6) This is also proven by family in CW01 where they prefer to dine in living room instead of dining room itself, as they argue it could help them to be more intimate with each other:
"We usually gather here (in living room). We sit on the sofa. But during dining time, we sit on the floor instead. Dining together on the carpet. Just like Indonesia style, to dine together. If we get time to gather then we won't dine on the table to be more intimate".

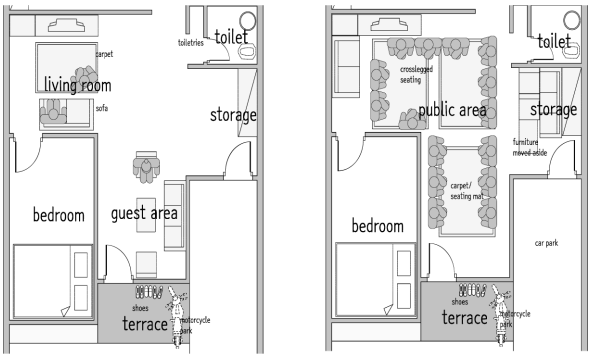
7) Both of these events are muslim's important religious days.

8) Arisan-literally translated as "cooperative endeavor", is a form of rotating credit association in a community, in which 'a lump sum fund composed of fixed contributions from each member of the association is distributed, at fixed intervals and as a whole, to each member of the association in turn'. (Geertz, 1962).

houses (AT01, KP01, GA02, CB01), they moved furniture into the garage or the terrace.

The reason why most people preferred to put movable partitions instead of permanent walls between the guest area and living room is to have extra space during special events.

However, depending on the number of visitors, they do not rearrange the room if unnecessary. In PB03, when few visitors came, they sat on the chairs. In KP03 where they have a considerably bigger guest area than other houses, they did not need to place a carpet for seating during certain events. Instead, they used extra space on the second floor where the place is always vacant.



a) *daily configuration* b) *event configuration*

Figure 5. *Spatial Layout During Events*

3. Personal activities

Traditionally, it was a custom that families sleep together or sleep separate according male or female except young children. Sometimes there was no clear designated sleeping space for men[9]. But this custom has disappeared in contemporary urban houses in Indonesia.

In this study, it was found that parents sleep in master bedrooms, while each child slept in her or his own bedroom as like western lifestyle. Children have their own individual bedrooms. Except GA02, all master bedrooms were located on the first floor, and children's bedrooms were either located on the first floor or the second floor.

All families used modern bed furniture such as beds, desk and chairs in their bedrooms. In PB03, the children preferred to sleep together in the living room instead of their bedroom. They put sleeping mattresses on the floor while the television was turned on as background noise.

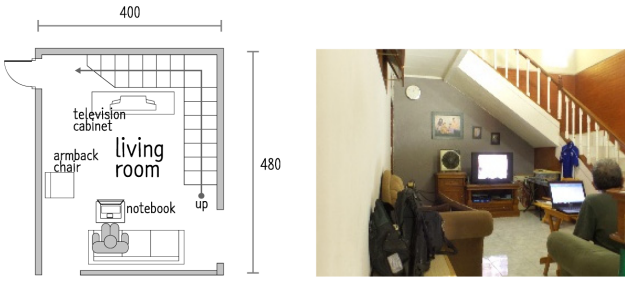
a) *interior configuration* b) *view to bed, facing window* c) *study desk and television to fulfill personal needs*

Figure 6. *Children's Bedroom (AC01)*

As a hobby, they enjoy gardening, working, and studying. Gardening activities are usually done in the front yard. By building regulations, the front of the house should be built as set back from the street, therefore this front yard space were usually used as garden. In GA02, the husband uses hydroponic media for gardening to save space in his narrow front yard. In AT01, the resident was gardening in the inner court located at the back of the house. This inner court was previously a backyard and it was paved with tiles to avoid dirt and allow for easy maintenance. Potted plants were hung in this area, while allowing for shoes and bicycles to be stored in the same area.

Internet browsing is the most common personal activity in the living room. In CW01, the desktop computer is put in the living room to monitor children's use of computers, but most of the families prefer movable laptops instead of desktop computers.

Children in AT01 and PB03 stated that they prefer to study in living rooms[10]. But in AT01, KP01 and KP02, children preferred their bedrooms for studying to avoid distraction and enjoy more privacy.



a) *the preferable interior configuration* b) *photograph where the activity was performed (KP02)*

Figure 7. *Living Room as Personal Activities Area*

9) Traditionally Southeast Asian sleeping custom varied by culture. In Malay houses in West Borneo, sleeping spaces were separated by gender (Zain, 2012). In Minangkabau ethnicity, separation by gender was much stronger, thus the sons could not sleep inside of the house when they became adults (Widya, 2001). Instead, they could sleep inside surau, which is a communal building.

10) Elder daughter in AT01 said that she preferred to study in living room.
"I prefer to study here (in the living room). But my younger brother prefers to study in his bedroom. I rarely occupy my bedroom.... (I love to work in the living room) because of the television".

In all our cases, there is no dedicated study space as place to work and study. PC room was found in KP02 and AT01, but it was rarely used as nowadays they prefer to use portable notebooks. Instead of dedicated study room, they have various preferences of place for study. While we could not find any specific relationship with their age in using study space, we can state that study space are more related to personal preferences.

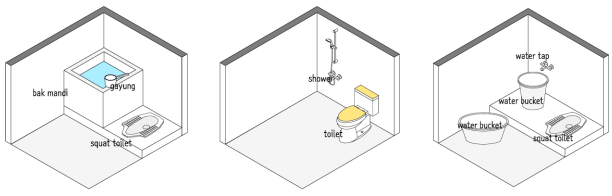
As a hobby, the husband in CB01 enjoys carpentry, therefore he set up his workshop in the balcony of the second floor. The family in CW01 built a fish pond in the back corner of the house.

Two bathrooms per house is a common case in our study (PB03, AC01, KP01, CW01, and GA02). CB01 was with one bathroom, KP02 was with three bathrooms, and KP03 and AT01 was with four bathrooms. Three cases (CW01, AC01 and KP02) had service toilets.

In Indonesian houses, there is a service toilet. It has multi-functions of second toilet and utility space for housekeeping and laundry[11].

Traditionally, bak mandi[12] to store water was installed in the bathroom. The families needed gayung[13] as a tool to use water. However, in modern houses, a shower was used instead, which is compact and practical. Showers and toilets were usually installed in the bathroom. In most of the cases, sit toilets were installed. Only in KP01, they preferred squat toilet for health reasons. Water sprinklers were installed nearby the toilet to wash after excreting activities. The bathtub is not common in typical Indonesian houses. In KP03, a bathtub was installed in the bathroom, but it was unused.

Bandung climate is noticeably colder than average Indonesian cities due to its location at the 675 meter above sea level. In our surveyed cases, gas heaters were installed in one bathroom in a house to save expenses, which became more frequently used than other bathrooms by family members.



a) *traditional bathroom* b) *modern bathroom* c) *service toilet*

Figure 8. *Types of Bathrooms*

4. Service activities

Household chores include laundry, cooking, and cleaning. These activities are related to the kitchen, dining, and service area. The service area includes the laundry area and drying area.

Having maids in middle class families is pretty common in Indonesia. But in none of our cases did the maids live together with the families in their houses. Only in KP03, AT01, and CW01, the families hired the maid twice or three times per week to assist in daily household chores. Most of the interviewed families preferred not to hire a maid due to trust issues (GA02 and PB03). They also did not need a maid's help anymore because their children were grown up so they could help with the daily chores (KP02 and AC01), or there was less work to do (KP01 and CB01). Thus, most of the household activities were done together with the help of all family members.

Families in KP01, KP02, and AC01 used to have maid's bedroom. In KP02 and AC01, maid's bedroom was changed into walk-in closet to store excess clothes. In KP01, maid's bedroom has been omitted when they renovated the house.

Based on the author's precedent study on housing design in the new town developed by major developers (Megawati et al., 2014), the design of the kitchen is unique in Indonesian housings. Typical kitchens are divided into two areas; the wet kitchen and the dry kitchen. The dry kitchen is used to prepare simple food. The wet kitchen is for more arduous jobs including laundry. Occasionally, the wet kitchen is directly connected to the garden and car parks, and functions as a workroom. There is also a private room and a separate bathroom for the housemaids in the wet kitchen However, we found that having both the wet kitchen and dry kitchen was not common in our cases. We guess that new towns developed by major developers target more high income people than our cases developed by local developers. The typical family in Indonesia don't prefer to hire maids in residence and nowadays they do household chores themselves.

A significant finding was that cooking was not active as expected in all cases. As most of the families were dual earner households, they preferred easy and light cooking food. The families in KP01 and KP02 stated that they preferred to buy ready-made food rather than spending time for cooking. Whereas modern kitchen cabinets are not common in Indonesian middle class houses, in KP03, the wife built a kitchenette to set electrical kitchen appliances such as the rice cooker. The

11) Service toilet is needed for the following reasons, which is mentioned by families in AC01:
"My mom is too clean. She likes to do laundry twice (hand washed in the toilet then using the laundry machine). She doesn't believe the laundry machine".

12) Bak mandi is water storage inside the bathroom, usually a square with the height of 80cm. It is made of brick and covered with porcelain.

13) Gayung is the tool used to scoop water, with a handle on one side.

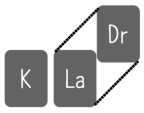
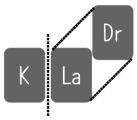
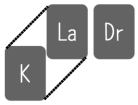
kitchen, in three cases (AC01, CW01, and AT01) was attached to the dining room. In the other six cases, the kitchen was designed as separate from the dining room <Table 6>.

Table 6. *The Space Relations between K/D*

L/D Relations	
	
AC01, CW01, AT01	PB03, KP01, KP02, KP03, KP03, CB01, GA02
a) *kitchen attached to dining room*	b) *kitchen separated from dining room*

All of the cases use washing machines for laundry. They set their washing machines in the second floor next to the balcony (4 cases) or in the first floor at the back of the house next to the kitchen (5 cases). In KP03, they moved the laundry area from the first floor to the second floor during the first renovation, because it was convenient to have the laundry area on the second floor to be closer to the drying area. The drying area in this case was located on the second floor to receive more sunlight and to keep the laundry from being exposed to visitors <Table 7>.

Table 7. *The Space Relations between K/La/Dr*

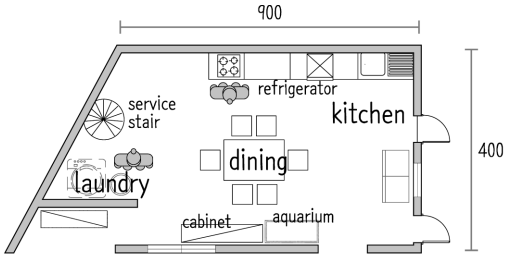
K/La/Dr Relations			
			
PB03	AC01, KP02	CW01, CB01	KP01, KP03, AT01, GA02
a) *kitchen, laundry, and drying area are in the same room*	b) *kitchen and laundry in the same room, drying on the second floor*	c) *laundry area separated from kitchen, drying area on the second floor*	d) *laundry and drying area on the second floor*

The laundry areas in KP02, AC01, CW01, CB01 and PB03, were located nearby the kitchen. In these cases, the drying area was located either next to the laundry area on the first floor (PB03) or in the balcony on the second floor (KP02, AC01, CW01, and CB01). People preferred to dry clothes under direct sunlight outside.

If the drying area was located on the second floor, the families built service stairs to connect the laundry area to the drying area (KP02 and AC01). However, as the wife in CB01 informed us, she would actually prefer to dry her clothes on the first floor instead, as she became older.

Dried clothes are ironed and then stored in wardrobes in every bedroom. It is uncommon to have walk-in closets in typical houses, but some families such as in AC01 and KP02 had walk-in closets. In AC01, the former maid bedroom was transformed into a walk-in closet for ironing and storing clothes. In KP02, they converted the bedroom that was no longer used into a walk-in closet room.

Generally, service activities take place at the back of the house. Hence, the kitchen, laundry, and drying area are located at the back part of the house. Except for GA02, the kitchen was located nearby the side entrance at the front for easier access to put groceries after shopping.



a) *interior plan*

b) *view to dining room* c) *service stair and laundry area* d) *drying area*

Figure 9. *Service Area in AC01*

IV. Summary and Conclusion

As a result of this study, activities in major rooms can be summarized as follows <Figure 10>:

A living room can be defined as a multi-functional space that is able to accommodate diverse activities and as the center of the house. Watching television is the most active behavior in a living room. Also praying is an important behavior held in living rooms. This behavior encourages interaction and forms strong bonds between family members. In most of houses surveyed, social gathering events still took place in houses, the living room and guest area are combined to hold the event, therefore the most important issue for designing a living room and guest area is flexibility.

Guest space is the most unique in Indonesian houses which are not strongly found in other Southeast Asian houses. As in Javanese houses, *pringgitan* located between the *pendhapa* (public space) and the *dalem* (private space) serves as a space

to host formal guest, guest space is designated in all surveyed houses. We can state that the traditional custom is still well kept even though this guest space was not considered in the original house design.

Traditional houses have no space dedicated for each family member for sleeping, but all of our cases have bedrooms for each family member. So, Indonesian adopted the Western way to secure the sleeping space. The bedroom is the space for sleeping, as well as personal activities. It is also a place to perform prayers for the family. The bedroom is considered to be the most private space in the house.

Two bathrooms per house is the most common among our cases. In the bathroom, showers, toilets (sit toilets) and bak mandi were normally furnished. Service toilets are located at the back of the house to assist the household chores, such as laundry activity. In bathing and excreting habit, people still prefer the traditional way. Since it is common to locate the bathrooms at the back side of a house, we think that the tradition that the most private spaces were located at the back of a house still remains.

It is interesting that dining rooms were found not actively used, as dining activity usually took place in the living room instead, and most families enjoy food outside. Most of the interviewees stated they do not need a large space for the kitchen because they prefer to buy ready-made food outside. Food vendors are easily found in the nearby community. This is viewed as a new trend of an urban lifestyle, which has also become common globally.

Service areas such as kitchens and laundry areas were rarely provided by developers when they built the small size houses. Residents expanded this area to accommodate their daily chores such as laundry, drying and ironing. They prefer to put drying clothes on the second floor to get more sunlight and for privacy issues. They feel however that the distance between the laundry space and drying space is inconvenient. So sometimes they built direct staircases to connect the laundry space on the first floor with the drying space on the second floor. Service area was one of the main reasons for house transformation.

As this study investigates the basic behavior of Indonesian living through case studies rather than through quantitative data, it has some limitations in generalizing the findings. However, this study can help us understand the key characteristics and unique identity of Indonesian housing culture. As a next step, we plan to track the transformation process of their living behavior to find the changes in their housing needs and lifestyle.

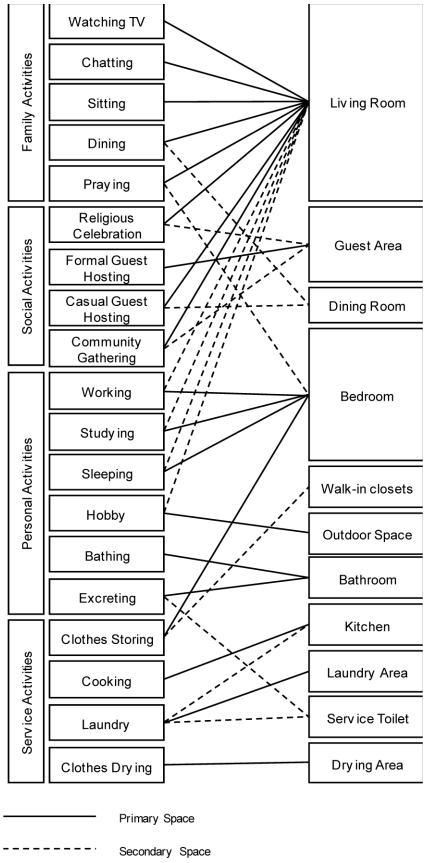


Figure 10. *Activities and Their Corresponding Spaces*

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