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To cite this article: W Zahrah *et al* 2020 *IOP Conf. Ser.: Earth Environ. Sci.* **452** 012020

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Community perception and adaptation about living in shop house in Medan, Indonesia

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Abstract. Shop house is one of the urban mix-use typologies that unites both commercial and housing function in one building. This type has been built since 900 BC, still and tends to be built more and more, particularly in Medan, Indonesia. This paper aims to describe how people perceived and adapted to the house of limited view, daylight, natural ventilation, and without a courtyard. The research took place in three shop houses corridors in Medan, namely Jamin Ginting, Setia Budi, and Sutomo Corridors. The study used a mix of qualitative and quantitative methods. The data of residents' perception was collected through an evaluation-statement in five points Likert scale. The way people adapted the house was identified by analyzing the questionnaire by using descriptive statistic. The overall analysis was carried out through qualitative approach, that explaining the phenomenon and all relevant variables. The investigation found that respectively the community was satisfied with their house, especially the commercial area, as the needs they prioritized above a house. As a consequence, they adapted to the other rooms of limited view, natural ventilation, and dimension. However, while the residents in Sutomo Corridor had no wish of another house, the Jamin Ginting and Setiabudi Corridors' occupants still dreamed of a more spacious landed house with courtyard.

1. Introduction

Interaction between humans and the built environment occurs through the process of perception [1]. Humans sense objects in their environment, process it, and make the meaning of the objects, called 'perception.' Next, humans react for the object based on the perception [2]. According to the scheme of perception proposed by Bell et al. [3], the first connection between humans and the environment is physical contact. The objects appear with their functions, and the individuals come with their own personalities, past experiences, abilities, interests, and other specific characteristics. The Bell's scheme also presents that how a built environment used depends on someone's perception about it. The perception generates some modifications through 'adaptation' (humans change their behavior to match the environment) and or 'adjustment' (humans change the environment to fit their needs).

In this study, the research focused on community perception and adaptation in shop house in Medan, Indonesia, for several reasons. First, the shop houses are the most building typology have been built in many urban areas in Indonesia, including Medan, Sumatra Utara [4]. The city is the third biggest city in Indonesia, with more than 2.6 million population. The fact indicates that the development of the buildings is significant in making urban image and live. Second, most shop houses have been built without architects. In other words, it is a kind of 'architecture without architects' [5], a tradition that architect should pay attention to, in order to understand exactly what people need.



Many studies about shop houses in Indonesia were carried out from various points of view, e.g. spatial arrangement and comfort [6][7][8], building topology [9], location [10], urban vitality [11], and thermal comfort [12][13][14]. It was very rarely the study that analyzing shop houses through environment-behavior approach, even though this aspect is very crucial to discover user needs.

2. Method

The study location was in three shop houses corridor in Medan, namely Sutomo, Jamin Ginting, and Setia Budi corridors. The research used the environment-behavior architecture approach and was based on qualitative and quantitative data. The variables that investigated were shop house characteristics, both social and physical aspects, design process, community perception, and community adaptation. The information about the physical condition of shop houses – as ‘design-result’ by the community – both at urban and building scale, was obtained through mapping and visual survey. This kind of data was the objective condition that people used and perceived. The quantitative facts were collected through the questionnaire. The study operated a set of open-ended questions about residents’ socio-cultural background, design process, and form and space arrangement. To get the community’s perception and adaptation, the survey implemented five-point Likert Scale, consisted of evaluation statement of residents about the quality of space, ranging from 1 (very disagree) to 5 (very agree).

The investigation of users’ socio-cultural background, design process, and form and space arrangement used qualitative approach, by description and explanation related to the phenomenon. The analysis was supported by visual survey and descriptive statistics of questionnaires. The perception and adaptation pattern analysis referred to the mean score of the evaluative statement of respondents in the association of the objective facts and relevant theories.

3. Results and discussions

3.1. Shop house characteristics

- Socio-cultural background

The respondents’ socio-cultural background varied in the three study objects. The Sutomo shop houses, the oldest area that had been built since the Dutch era, was occupied from generation to generation. The residents were 36 – 65 years old, had income up to IDR 30 million per month, and most of them were Chinese. The Jamin Ginting shop house was inhabited by the young entrepreneur of younger than 36 years, was rented not owned, and earned up to IDR 20 million per month. They varied in ethnicity: Batakese, Karonese, and Chinese. The Setiabudi shop house consisted of young businessmen, too. They also rented the building, gained up to IDR 20 million per month, and was people of Javanese, Bataknese, and Chinese. Most of all three shop houses were retailers of various stuff.

- Physical quality

- a. Function

At urban space scale, most of the building function was goods and services commercial. The activities might take place inside and outside buildings, including building front yard, pedestrian path, even a part of vehicles trail. Some public space was occupied by the building’s owner to expand their commercial area, and or used as cars and motor bike parking. They looked freely modified the physical structure of the street and walkway.

At building scale, there was only 20 % function as home and shop all at once. The shop houses mostly operated for the only commercial, and also a temporary living space for shopkeeper worker. It can be said that the term ‘shop houses’ referred to the morphology of urban building that looked like a long narrow shape, rather than a mix-use function as shop and house.

- b. Border

At the urban scale, there is a blurring of boundaries between public and private zone by the intervention of private trading area to the communal space. In some segments, the edge of the pedestrian path was not so clear, even disappeared and 'melting' into private buildings section.

At the building scale, the border of the private area was determined by the difference of building level. However, there was direct access from the public zone of the commercial area. The arrangement of rooms in the house makes it possible for all rooms to be visually connected each other, because of the limited size and space. It was a compact lay out.

c. Organization

Most of the space arrangement inside the shop houses were a linear order, that connected by a multifunction corridor. Some private zones were clustered with low degree enclosure.

d. Quality

At the urban scale, the quality of building frontage and mass and facade aesthetic was quite low. There was no urban design guidelines, so that much urban space element was not well arranged.

3.2. Design process

a. Person in charge

The development of a shop house was initiated first by a developer, both construction firm or individuals. Less than 20 % of shop houses owners that built it by themselves. Then the earliest one to play a role in its development was the developers. At post-occupancy phase, most of the residents modified the buildings. There was about 40 – 80 % of buildings were changed, mostly the paint and the interior lay out. At this stage, it was the head of the family (mostly father) that took the principal role. There was less than 4 % of shop houses occupier that hired an architect.

b. Space arrangement

The key person in the space arrangement of the shop house prioritized the business area comfort, as well as cost and space efficiency aspects. The physical appearance of the buildings was based on economic goals and efficiency. It could be seen both at urban and building scale. One of the lowest priority was aesthetic features.

3.3. Community perception

The perceived space quality in this research focused on the aspects of accessibility, safety, and security (crime, fire, and flood threat), size, daylighting, natural cooling, view, and aesthetic. The survey found that the buildings had limited public access, even though there was a direct connection from business to private zone. More than 70 % of respondents stated that the house could be accessed only by family members. There was less than 20 % of residents said that the shop workers could get into the house without permission.

In Jamin Ginting, the accessibility was not so strict. The survey indicated that the rooms that could be entered without permit had a higher percentage than Sutomo. This could be understood as a consequence of the permanent occupancy function that was not dominant in this corridor. The existing housing is more a place to live for employees or boarding / student lodgings whose access is more public than permanent residences. This kind of character was also found in residential units in shophouses in Setia Budi.

The next room quality variables evaluated based on occupant perceptions were safety (from thief, fire and flood hazard), room area, daylight, natural air flow, scenery, and aesthetics / beauty. The results of the study showed that there were no significant differences in the quality of space in the three corridors. Residents considered the security aspects of thieves and floods, and the area of the space was the best among other aspects, with an average rating between 3.8 - 4.2. This showed that the width of the shop house, measuring between 4-6 meters and a length of more than 10 meters, was

considered to be sufficient to accommodate the activities. Some other factors got a bad rating to very bad, namely aspects of lighting, natural air flow, scenery, and aesthetics / beauty. From these aspects, the lowest value was the aesthetic / beauty aspect, and the scenery, with an average value of less than 3 (bad).

The landscape aspect was very difficult to design with the morphology of the shophouse that extended narrow. The most likely view could only be applied to the front room facing the road. However, this often also could not be done if the entire facade simultaneously functioned as a giant billboard, as a consequence of the main function of the shophouse as a building for business. Moreover, spatial planning carried out by residents almost did not involve architects, so that this aspect and the aesthetic aspect were considered unfavorable. Natural air flow was actually still possible through openings in front of, behind shop houses, and stair areas, but this also often did not take place effectively. Space between the two inlets and air circuits was not always an open plan. There were partitions and or walls that preventing air flow.

Table 1. Perception of the quality of business space and bed room in shop houses

Variable	Business space			Bedroom		
	Sutomo	Jamin Ginting	Setiabudi	Sutomo	Jamin Ginting	Setiabudi
Security from thieves	3.6	3.50	3.8	3.8	3.93	4.2
Fire safety	3.4	3.48	3.8	3.5	3.57	3.8
Safety against flood hazards	3.5	3.75	3.7	3.8	4.04	4.0
Size of the room	3.6	3.94	4.0	3.5	4.09	4.0
Daylighting	3.2	3.53	3.4	3.3	3.51	3.4
Natural air flow	3.1	3.43	3.2	3.2	3.62	3.4
View	3.0	3.35	2.9	3.52	3.30	3.0
Aesthetics / beauty	3.0	3.19	3.0	3.16	3.26	2.99
Average	3.30	3.52	3.48	3.47	3.67	3.6

Nevertheless, the average shop house occupants were satisfied with the shop building. The highest value of satisfaction level was seen in the business area aspect, and the lowest satisfaction level in parking / garage and guest/consumer parking aspects. The problem of parking was a major problem for the convenience of activities in the area, especially the shop houses with zero border as in the Sutomo Corridor. Parking that used the part of vehicle path was very limited. If the parking was arranged in a parallel form, each lot of shophouses was only able to accommodate parking at least for one car. In fact, residents owned a private car. In the area of Jamin Ginting and Setia Budi, the border area of the shop houses actually had the potential to become a sufficient parking space. But this zone had even been made into an expansion of trading areas or leased to other traders (street vendors or temporary traders who did not have permanent buildings).

The level of satisfaction of the average occupants of the rooms in the shophouse showed a number of less than 4, which meant it had not yet reached the ideal satisfaction. The lowest level of satisfaction was found in the Sutomo corridor area with an average value of 3.4, and the highest level of satisfaction in the Setia Budi with an average value of 3.6. However, when viewed from the percentage of this level of satisfaction, which gave a value of 'satisfied' to 'very satisfied' generally more than those who said 'less satisfied' to 'very dissatisfied.' Thus, the quality of the shop houses rooms was quite acceptable by the occupants even though they did not meet the ideal preferences.

The average level of satisfaction with the whole building also showed the highest value in the business zone and a more extensive value in the residential section. It can be said, residents faced the consequences by prioritizing the space for a business function, and the residential area was 'sacrificed.'

Table 2. Level of satisfaction of shophouses' rooms

Variable	Sutomo	Jamin Ginting	Setiabudi
Business space	3.9	3.95	4.0
Living room	3.4	3.53	3.7
Sleeping room for family members	3.6	3.67	3.8
Employee bedroom	3.3	3.74	3.7
Dining room	3.6	3.59	3.7
Family room	3.6	3.42	3.8
Kitchen	3.6	3.70	3.7
Public bathroom	3.6	3.84	3.8
Private bathroom	3.6	3.85	3.7
Store	3.6	3.52	3.6
Services area (wash and dry)	3.6	3.67	3.5
Private vehicle parking / garage / carport	2.6	3.32	2.7
Guest parking	2.9	3.42	3.4
The level of security of buildings from crime	3.3	3.42	3.5
Safety level of the building from fire hazards	3.3	3.55	3.6
The level of safety of buildings from flood hazards	3.4	3.78	3.6
Average	3.43	3.62	3.61

Table 3. Level of satisfaction of shophouses' building

Variable	Sutomo	Jamin Ginting	Setia budi
Bussiness space	3.9	4.11	4.1
Home	3.3	3.7	3.7
Whole building	3.5	3.69	3.9
Average	3.57	3.79	3.90

3.4. Community adaptation

Exploration of occupant behavior patterns was based on concepts that were well known in the study of environmental-behavior architecture, namely adaptation and adjustment. The majority of shop houses-dwellers (around 65%) stated that they had previously lived in other buildings, most of whom had previously lived in single houses (more than 25%). Thus, almost all residents of the shop experienced a change in residential settings when they decided to live in the shop houses. One of the big differences between shop houses and other residential buildings was that the patterns are lined up so as to form a dense area, as well as limited views and courtyards. In addition, more than 60% of

respondents, both of whom inhabited the Sutomo Corridor, Jamin Ginting and Setia Budi stated that when they first inhabited the shop houses, the available space was incomplete and not in accordance with their wishes. When the environment did not meet human needs, the response process could be seen in two forms, first, adaptation, which was humans who adjusted to their environment, second adjustment, humans changed the environment to suit their needs. Both of these things seem to be done by shop houses in the study area.

The study provided the fact that the majority of shop-dwellers felt that their habits had not changed since they lived in the shop houses (Sutomo 63.8%, Jamin Ginting 56.1%, SetiaBudi 65.0%). While the rest felt that there are habits that have changed since living in the shop. With the density, dimensions, and spatial arrangement very different from a single house, several adaptation processes were carried out. There was 22.7% of shop-dwellers in the Sutomo Corridor stated that they "before living in the shop liked a room with a large window, not anymore." This meant that they changed their preferences for window sizes and accepted this limitation in shop houses. Furthermore, related to the habit of doing activities in the home yard, 36.5% of respondents stated that they "before living in a shop like to do activities outside the building (terrace or yard), not anymore." It can be said that the condition of the shop house without the yard and terrace forced the residents to move more in the building. In the absence of a yard, the majority of respondents (66.4%) disagreed to strongly disagree with the statement "I can still maintain plants in the shop now." This gave an indication that the activity of maintaining plants was no longer carried out in the buildings. On the other hand, with the compact structure of the building, most of the occupants of the shop stated "agree" to "strongly agree" with the statement "Since living in the shop house I find it easier to supervise every room." It can be said that the sense of security increases when living in a shop.

In terms of relations with neighbors, the majority of respondents stated 'disagree' to 'strongly disagree' with the statement 'Since living in a shop, I have become less sociable with neighbors.' That was, in terms of relations with the neighbors, most respondents said there was no change. The majority of respondents said they knew less than 10 neighbors who lived in a row with the building they lived in. They mostly interacted with neighbors, even though there was no organization that united fellow neighbors/between shop-dwellers.

Another form of adaptation was the attitude toward lighting and artificial ventilation in buildings. One of the main characters of the spaces in the shop building was the limited source of natural lighting and natural ventilation. The inlet of daylight came only from the front and rear facades, where the distance between the two facades could be as far as 25 meters. The front facade, because it was often used as an information board and / or advertisement for business functions in a shop, also often did not allow for windows that could be opened and closed. Meanwhile, the rear facade almost always faced a narrow alley of no more than 2 meters, which prevented the entry of light more freely. This situation forced the use of artificial lighting and ventilation, both of which could be avoided, or at least always used in the typology of a single building whose four sides gained access to light and air.

The majority of respondents stated 'agree' or 'strongly agree' with the statement 'Since living in the shop I have not had any problem with the use of lights during the day.' This attitude impacted on the readiness of the costs that might be deserved for electrical energy. However, in the use of AC, the majority of respondents stated 'less disagree', 'disagree' or 'strongly disagree' with the statement 'I previously had no problem without air conditioning, since living in a shop house, air conditioners have become a major requirement in my home.' About more than 40% of respondents agreed with this statement. This meant that there has been an adaptation of the attitude of acceptance of the use of AC as artificial air cooling.

In terms of perceptions of crowding, the majority of respondents in the three corridors said they felt a sense of distress living inside the shop. But they thought it was not a problem, so it could be said they have adapted to it.

With various adaptation processes carried out by shop-dwellers, both in terms of daily activities/habits, neighborhood relations, attitudes towards energy use, and distress, this study showed that the majority of shop-dwellers (more than 70%) said they still wanted to live in other dwellings, and less

than 30% felt that the shop was now enough. The residents in Sutomo's shop were the most said that the existing shop house was sufficient (23.3%). Among those who still wanted ideal housing, expected to live in a single house that was not integrated with the business space (40-50%), in a better shop house(24-38%), and in an apartment(2-7%).

Table 4. Views on changing habits since living in shop houses

Variable	Sutomo	Jamin Ginting	Setia Budi
Nothing in my habits has changed since I lived in a shop	3,6	3,56	3,7
Some of my habits have changed since I lived in a shop	3,2	3,41	3,2
I became more sensitive to security	3,8	4,02	4,0
Before living in the shop, I liked the room with the big window, not anymore	2,9	3,44	3,2
Before living in a shop, I liked to do activities outside the building (terrace or yard), not anymore	3,2	3,54	3,3
I can still maintain plants in the shop now	3,1	3,41	3,1
I previously lived in a building that has a courtyard	3,6	3,55	3,7
Since living in a shop, I find it easier to monitor every room	3,8	3,60	3,7
Since living in the shop, I have become less sociable with neighbors	3,2	3,08	3,3
Since living in the shop, I still have the opportunity to get along with neighbors, like before	3,6	3,73	3,5
Since living in the shop, I have not had any problem using daylight	3,4	3,53	3,7
I previously had no problem without air conditioning, since living in a shop AC is a major need in my home	3,2	3,53	3,1
I feel the distress of living in the shop	3,5	3,14	3,7
I consider crowding is not a problem in the shop area	3,3	3,43	3,3
Average	3,39	3,50	3,46

As described above, the majority of shop-occupants were those who previously did not live in the shop, with most of them living in a single house that had a yard. Changes in residential settings from non-dense residential areas to denser areas caused adjustments, both from occupant behavior, as well as from physical changes of buildings. This fact confirmed the adaptation pattern called 'adjustment' [2].

In the case of the shop houses studied, the majority of respondents (57-64%) stated that when they first inhabited the shop, the existing spaces were incomplete according to their wishes. For this reason, most respondents stated that they made room changes with a portion of between 40-80%. The only common space available was the business room on the ground floor and the bathroom. Meanwhile, other rooms were still not available. Even if there were, then these spaces had not met the wishes of the occupants. Among the most common adjustment measured taken by shop-occupants was changing the wall paint and installing partition between the rooms.

4. Conclusions

This study found that although in all locations the residents adapted, there were differences in perceptions of shop houses between the three study areas. Sutomo respondents tended to be in a homeostatic condition. Although the average level of satisfaction with the buildings they lived in was

lower than those in the Jamin Ginting and Setiabudi corridors, they felt they did not need another place to stay. The opposite was found in the Jamin Ginting and Setiabudi Corridors, where the average value of satisfaction with shop houses was higher, but still had dreams of an ideal place to live. Different cultural backgrounds seemed to be an explanation for this difference. Those who lived in Sutomo's shop were generally ethnic Chinese, who indeed have long lived culture living in the shop. Not the people in Setiabudi and Jamin Ginting, those of Batak, Javanese, Karo or Minang ethnicity, who were previously accustomed to living in a single housing. Further research is needed to explore how this cultural background influences people's ideal wishes for the environment they built.

References

- [1] Rapoport, Amos, 1987, *Human Aspect of Urban Form*, Oxford: Pergamon Press
- [2] Sarwono, Sarlito Wirawan, 1992. *Psikologi Lingkungan*, Jakarta : Gramedia dan Program Pascasarjana Program Studi Psikologi, Universitas Indonesia
- [3] Bell, Fisher, Loomis. 1978. *Environmental Psychology*. Philadelphia: W.B.
- [4] Zahrah, Wahyuni, 2015. Urban design guidelines for shop houses: a temperature modification approach. *Procedia Social and Behavioral Science*, 179 (2015) 308 - 317
- [5] Rudofsky, Adolf. 1964. *Architecture without Architects. A Short Introduction to Non-Pedigreed Architecture*. New York: The Museum of Modern Art
- [6] Dewi, Aryanti; Antariksa, San Soesanto, 2005. Pengaruh kegiatan berdagang terhadap pola ruang dalam bangunan rumah-toko di kawasan pecinan Kota Malang. *Jurnal Dimensi Teknik Arsitektur*, Lembaga Penelitian dan Pengabdian Kepada Masyarakat, Universitas Kristen Petra, Vol. 33, No. 1, Juli, hlm, 17-26.
- [7] Anggraini, 2012. Spatial Arrangement in Chinese and Javanese Shop House in Yogyakarta City. *Procedia - Social and Behavioral Sciences* Volume 36, 2012, Pages 557-564
- [8] Y U U Ginting, N Ginting and W Zahrah, 2019. The spatial comfort study of shophouse at Kampung Madras. *IOP Conf. Series: Earth and Environmental Science* 126 (2018) 012008
- [9] Firzal Yohannes, 2011. Tipologi bangunan tua, *Local Wisdom*, Volume: III, Nomor: 2, Halaman: 33 - 42, Juli 2011.
- [10] Octaryna, Vina; Widyanto, Dodi, 2012. Faktor-faktor yang mempengaruhi pemilihan lokasi rumah toko di kota Mataram, *Jurnal Bumi Indonesia*. Volume 1, Nomor 3. Hal 202 -212
- [11] AF Pohan, N Ginting, W Zahrah, 2019. Environmental vitality study on shop house area. Case study: Asia Mega Mas shop house area, Medan. *IOP Conference Series: Materials Science and Engineering* 505 (1)
- [12] Omar, N.A.M.; Syed-Fadzil, S.F., 2011. Assessment of Passive Thermal Performance for a Penang Heritage Shop house, *Procedia Engineering* 20 (2011) 203 – 212
- [13] Dang, Hung Thanh; Pitts, Adrian 2017. Influences of Building and Urban Typologies on the Study of Thermal Comfort in 'Shophouse' Dwellings in Ho Chi Minh City, Vietnam. *Conference Paper. PLEA 2017 Edinburg*.
- [14] Sari, Laina Hilma; Yuzni, Siti Zulfa; Haiqal, Muhammad; Z ,Evalina, 2017. A review of spatial comfort in shophouse in humid tropics. *IOP Conf. Series: Materials Science and Engineering* 352 (2018) 012066