

## The meaning of comfort and security from occupant's perspective Case study: Comparison of fenced and unfenced houses

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ARTICLE INFO	ABSTRACT
<p><i>Article history:</i> Received May 05, 2022 Received in revised form Jan. 15, 2023 Accepted March 12, 2023 Available online April 01, 2023</p> <p><i>Keywords:</i> Comfort Disturbance Housing Security</p> <p><b>*Corresponding author:</b> Hanson Endra Kusuma Department of Architecture, School of Architecture, Planning and Policy Development, Institut Teknologi Bandung, Indonesia Email: <a href="mailto:hekusuma@gmail.com">hekusuma@gmail.com</a> ORCID: <a href="https://orcid.org/0000-0002-4945-3225">https://orcid.org/0000-0002-4945-3225</a></p>	<p>Currently, the design of unfenced houses is an option that is equal to the number of people who prefer fenced houses. The preference of housing design has various qualities and environmental disturbances that have impacts on the comfort and security felt by occupants. This study aims to identify the meaning of comfort and security from occupant's perspective against the choosing of housing concept. The research was carried out in two steps, the first step was performed qualitatively with an open-ended questionnaire. The second step of research was continued quantitatively by collecting data using an online questionnaire with close-ended questions. The results of the data collected were analyzed using factor analysis and multivariate regression analysis. The final result of the research found that the presence of a fenced or unfenced did not affect the meaning of comfort and security in the dwellings. Factors from environmental disturbances also did not affect the comfort and safety of occupants in choosing the type of housing where occupants already understand the situation that is being completely limited. This is very closely related to the pandemic situation when the research was carried out. The meaning of comfort and security is more influenced by the ability of the occupants themselves to adapt doing activities in their homes or in their territorial environment.</p>

### Introduction

House is the smallest unit of dwelling; whose functions are increasingly complex and significant for the activities of its occupants (Pratami and Rahmi 2021). House is a place that functions as shelter, as a place to provide comfort and safety from weather conditions and wild animals, as well as a place to rest (Hamzah and Anderson 2020). House is also a place that functions as security and control, providing space for activity, relationship and continuity, as well as identity and value for the occupants (Gram-Hanssen and Darby 2018; Purbadi, Sumardiyanto,

and Vitasurya 2023). The house has a vital role in terms of privacy and connectedness between its occupants. Privacy gives occupants flexibility in expressing personal preferences and lifestyles, while connectedness between occupants can provide bonds with other residents (Willems, De Smet, and Heylighen 2020; Tarigan 2023; Rahmawati, Arifin, and Dwisusanto 2023).

Design of houses in Indonesia are divided into two types, namely fenced house and unfenced house (Awanis, Anward, and Zwagery 2018). In a house, the fence functions as a property boundary, safety, and aesthetic element (Saraswati and Azhar 2019). The fence also



functions as a barrier between public and private areas, namely between roads and residential areas (Kiswari 2021). In addition to being a barrier, a fence in a residential area provides security against outside disturbances, such as preventing strangers from entering and leaving the area of the house, in keeping the children inside so they don't leave easily unnoticed, and keeping pets from escaping (Dian Saraswati and Damiana Nestri Kiswari 2019). However, apart from functioning as a protection from the threat of danger, the fence also functions as a social boundary in avoiding direct social contact between neighbours (Siregar, Tanaka, and Marthin 2021). This kind of house contrasts to an unfenced house, which does not have walls, fences, gates, or security guards. Several studies conducted in Germany, Finland, Romania, Slovenia, Slovak Republic, and Sweden show that low crime rates were found in unfenced houses. Low crime rates provide unfenced homeowners with a sense of security (Cséfalvay and Webster 2012).

The quality of the residential environment influences residents to choose their house, one of which is the quality of the security system. Security is closely related to maintaining privacy when interacting with families (Pagani and Binder 2023). Residents feel secure if they are not afraid of other people and crimes outside their houses (Blandy 2018). Access to and from residential areas can determine the level of safety and comfortable perceived by the occupants to live in or when leaving their homes (Simbolon 2019). The security factor of the residence also affects the comfort of the occupants' activities inside the house (Frederick et al. 2014). The feeling of comfort can be observed from the occupants who feel at home living in their house (Widyarthara 2017). Environmental comfort in housing is closely related to occupants' satisfaction with the participation and occupants' comfort in their house (Syafriana et al. 2019).

The low sense of safety and comfort in housing is a measure of the level of occupant satisfaction which can affect indicators of environmental quality. The number of vacant dwellings is inseparable from the level of satisfaction with the housing environment (Abadi 2008). One of the factors of neglected empty housing is a narrow access road which makes it difficult for residents to go in and out of the house (Baba and Hino 2019). The phenomenon of an empty house is also very likely to occur in dwellings located in areas with poor

environmental conditions or poor accessibility (Joo and Lee 2021).

Learning from the facts above, the phenomenon of an empty house indicates the satisfaction level of residents feeling safe and comfortable in their dwelling. Low occupant satisfaction with their occupancy can increase house abandonment, impacting the quality of the surrounding housing environment. Understanding the meaning of the comfort and safety perceived by occupants is very important to build the resilience of occupants, to reduce the phenomenon of abandoned houses. Therefore, further studies are needed regarding the meaning of comfort and safety based on the occupants' perspective. The purpose of this research is to identify the factors that affect the safety and comfort of a house in comparison between fenced and unfenced houses in Indonesia.

## Method

This research was conducted in two stages: Firstly, the qualitative stage, and Secondly, the quantitative stage. The qualitative stage was conducted to explore perception factors contributing to the respondents' preference for fenced and unfenced houses. The quantitative stage was carried out to examine the relationship between factors of quality, activity, and level of disturbances in housing preferences. In both stages, the revealed preference approach was carried out by asking the respondent directly from the reference to the house being occupied through a questionnaire. Therefore, the research was conducted using a mixed-method approach with aspects of quantitative methods and qualitative procedures (Creswell 2014). Mix-method research consists of exploratory and explanatory research (Groat and Wang 2013).

### Data collection

Data was collected through an online questionnaire. The sample was selected using a non-random sampling method, in the form of a snowball sampling technique (Kumar 2005). The technique of snowball sampling is the process of selecting a sample starting from several respondents in one group independently. After the data was obtained, the respondent continues to select several other respondents in different groups to become the next sample and continues

until the data or information reaches the target number of at least 100 people. Accurate statistical calculation results require the collection of a larger sample (Kumar 2005).

In the first stage, the data was collected using an online questionnaire distributed over four days from September 9 to September 12 2021. The online questionnaire is open-ended so that in answering questions, respondents can freely argue according to what they think and feel according to the research topic, namely the respondents' preferences to the concept of occupancy. The online questionnaire consists of 14 questions, with 8 questions regarding the demographics of the respondent and 1 question each regarding the current residence, type of house, reasons for choosing the type of house, activities that are often carried out in the front yard of the house, problems/disorders, types of problems/disorders. The collected data were analyzed by content analysis using two stages, namely open coding and selective coding.

The results of the content analysis regarding the reasons for choosing the type of house were used to compile closed questions about the quality of the environment/place for the types of fenced and unfenced houses. There are seven sub-categories of environmental/place quality in fenced and non-fenced house types: occupant safety, access, design, facilities, occupant limitations, social interaction, and comfort.

The content analysis results regarding activities that are often carried out in the house's forecourt are used to compile closed questions about the types of activities that are often carried out in the front yard of the house with fenced and non-fenced types. There are 2 groups of variable types of activities divided into active and passive activities. Active activities consist of 17 types of activities, namely: gardening, chatting, interacting with neighbours, playing, sports, storing/parking vehicles, feeding animals, cleaning, washing vehicles, washing clothes, sweeping, drying things, doing chores, waiting, holding events, receiving guests, as well as eating and drinking. Passive activities consist of 6 activities: enjoying the surroundings, sunbathing, relaxing, listening to music, hanging out, and taking photos.

The result of the analysis regarding the types of problems/disturbances was used to compile closed questions about the types of disturbances experienced by occupants of fenced and non-fenced houses. There are 5 sub-categories of

disturbance types experienced in fenced and unfenced houses: strangers, theft, privacy, facilities, and security and safety.

Furthermore, research data was collected using an online questionnaire distributed for 10 days from October 31 to November 9 2021. The online questionnaire is closed-ended, with the question variables derived from the results of the previous qualitative stage. The data was collected from 140 respondents, consisting of 53 (38%) men and 87 (62%) women. Most respondents work as private employees, with details of 29 (21%) respondents. The highest monthly income of respondents ranged from Rp. 1.5 million – Rp. 3.5 million (42 or 30% of respondents). Regarding the pandemic conditions, respondents are spread across Kalimantan, Java, Sumatra and Sulawesi. The highest educational level is undergraduate (D3 and S1), with details of 112 (80%) respondents. Details of the length of stay of the highest number of respondents ranged from 1 to 10 years, with details of 66 (47%) respondents. Respondents' house type consists of private houses, family houses, boarding houses, contract houses, and official houses. The identity of the respondents is described in more detail in table 1.

**Table 1.** Identity of the respondents

Respondents' characteristics	Level	Frequency	
Domicile	Kalimantan	113	81%
	Java	24	17%
	Sumatera	1	1%
	Sulawesi	2	1%
Age	Late adolescence (17-25 years old)	46	33%
	Early adulthood (26-35 years old)	45	32%
	Late adulthood (36-45 years old)	28	20%
	Early middle age (46-55 years old)	16	11%
	Late middle age (56-65 years old)	3	2%
	Seniors (above 65 years old)	2	1%
Gender	Male	53	38%
	Female	87	62%
Marital status	Unmarried	54	39%
	Married, childless	14	10%
	Married, with children	72	51%
Occupation	Without employment	5	4%
	Freelancer	6	4%
	Housewife	13	9%
	Employee	23	16%

Respondents' characteristics	Level	Frequency	
	Civil servant	26	19%
	Private employees	29	21%
	Student	19	14%
	Retiree	1	1%
	Entrepreneur	18	13%
Income per month	No income	22	16%
	Less than 1,5 million IDR	12	9%
	1,5 million - 3,5 million IDR	42	30%
	3,5 million - 5 million IDR	22	16%
	5 million - 10 million IDR	25	18%
	More than 10 million IDR	17	12%
Education level	Highschool	20	14%
	Undergraduate (Diploma - Bachelor)	112	80%
	Post-graduate (Master-Ph. D)	7	5%
	Profession (Apothecary)	1	1%
Type of house	Unfenced	54	61%
	Fenced	86	39%
Duration of residence	Less than 1 year	17	12%
	1 - 10 years	66	47%
	11 - 20 years	26	19%

Respondents' characteristics	Level	Frequency	
	21 - 30 years	28	20%
	More than 30 years	3	2%
Type of dwellings	Private house	72	51%
	Rent house	8	6%
	Family house	53	38%
	Official house	3	2%
	Boarding house	4	3%

### Analysis

The online questionnaire consists of 91 questions, with 7 questions regarding the demographics of the respondents and 3 questions each regarding where they live now, 36 questions regarding the quality of the environment/place, 25 questions regarding activities that are often carried out in the front yard of the house, 16 questions regarding types of disturbances experienced on occupants with their occupancy concept, and 4 questions regarding behavioural responses. The questionnaire is a closed-ended question prepared using the semantic differential method (SD-method) and Likert scale. Each question is answered with the lowest 1 to 5 highest scale. An example of questions from the online questionnaire is shown in [table 2](#).

**Table 2.** The sample of close-ended questions

Variable	Example					
Quality of environment/place	Resident's safety					
	I feel safe from crime if my house is fenced					
	Strongly disagree	1	2	3	4	5
Active and Passive Activities in Home Yard	Active activities					
	Gardening					
	Never	1	2	3	4	5
Type of disturbances	Larceny					
	There was a theft of personal belongings at home					
	Never	1	2	3	4	5
Behavioral response	I want to stay where I live now					
	Strongly disagree	1	2	3	4	5

Furthermore, the questionnaire results in numerical data from each variable were analyzed quantitatively with factor analysis (FA). Factor analysis (FA) was performed by principal component analysis (PCA) and varimax rotation to obtain latent variables representing measured variables. The variables measured include environmental/place quality aspects (7 categories), active and passive activities in the yard (2 categories), types of disturbance (5 categories), and behavioural responses (2 categories). The measured variables are reduced to a few latent variables, which represent the majority of the variance of the main principal

components. The measured variables are reduced to a few latent variables, which represent the majority of the variance of the main principal components. The number of latent variables representing each measured variable is based on the eigenvalues that appear during factor analysis. The number of factors taken is with an eigenvalue of more than 1. The latent variable is then given a name that represents the various measured variables in the latent variable. In determining latent variables, measurable variables with a loading score of less than 0.5 are considered to have no significant role, so they are ignored in grouping latent variables. In addition, a

Multivariate regression analysis was performed to reveal the relationship between latent causal factors and latent causal factors.

## Result and discussion

### Environmental/place quality

PCA was carried out on variables measured by the environment/dwelling quality in fenced and unfenced houses.

The results obtained from the PCA consist of 9 main components of environmental/place

quality. Furthermore, the principal components were analyzed by FA using the varimax rotated component method.

The analysis found nine main components with an eigenvalue greater than one (with a cumulative percentage of 70.16%). These results are considered sufficient to describe and represent the phenomenon of the measurable variable of the quality of the environment/dwelling in fenced and non-fenced houses. The latent variables resulting from the factor analysis are shown in table 3.

**Table 3.** Analysis of environmental/dwelling quality factors in fenced and unfenced houses

Measured Variables	Mean	Factor Loading	Standard Deviation	Cronbach's $\alpha$	Eigenvalue/Variance	Percentage of Variance	Cum Percentage
<b>1st factor: Safety in unfenced house</b>	<b>2,38</b>		<b>1,04</b>	<b>0,94</b>	<b>5,25</b>	<b>14,58</b>	<b>14,58</b>
Stranger	2,34	0,86					
Crime	2,46	0,83					
Children's activity	2,21	0,83					
Storing vehicle	2,24	0,82					
Wild Animal Disturbance	2,09	0,80					
Presence of security guard	2,96	0,68					
<b>2nd factor: Safety in fenced house</b>	<b>4,25</b>		<b>0,60</b>	<b>0,84</b>	<b>4,47</b>	<b>12,39</b>	<b>26,96</b>
Storing vehicle	4,59	0,75					
Children's activity	4,57	0,71					
Wild Animal Disturbance	4,29	0,70					
Crime	4,36	0,67					
Stranger	4,47	0,65					
Privacy	4,44	0,52					
Ease of Access	3,07	0,50					
<b>3rd factor: Comfort in unfenced house</b>	<b>2,58</b>		<b>0,86</b>	<b>0,86</b>	<b>3,66</b>	<b>10,16</b>	<b>37,13</b>
Neatness	2,73	0,75					
Aesthetic impression	2,82	0,72					
Cosiness	2,44	0,69					
Privacy	2,32	0,68					
<b>4th factor: Boundary of Territory</b>	<b>3,93</b>		<b>0,89</b>	<b>0,73</b>	<b>2,81</b>	<b>7,79</b>	<b>44,93</b>
Boundary of Private Area (fenced)	4,13	0,83					
Boundary Between Land and Road (fenced)	4,20	0,83					
Important as a Barrier (unfenced)	3,47	0,57					
<b>5th factor: Access and Parking</b>	<b>3,33</b>		<b>0,34</b>	<b>0,61</b>	<b>2,46</b>	<b>6,84</b>	<b>51,77</b>
Ease of Access (unfenced)	3,99	0,69					
Narrowing the Parking Lot (fenced)	2,81	0,65					
Expanding Parking Area (unfenced)	3,41	0,54					
<b>6th factor: Social Interaction</b>	<b>2,98</b>		<b>1,05</b>	<b>0,69</b>	<b>1,84</b>	<b>5,11</b>	<b>56,88</b>

Measured Variables	Mean	Factor Loading	Standard Deviation	Cronbach's $\alpha$	Eigenvalue/Variance	Percentage of Variance	Cum Percentage
Limit socializing (fenced)	2,86	0,83					
Easier to socialize (unfenced)	3,09	0,74					
<b>7th factor: Owner Limitations</b>	<b>3,48</b>		<b>1,03</b>	<b>0,64</b>	<b>1,82</b>	<b>5,07</b>	<b>61,95</b>
Narrow Site (unfenced)	3,39	0,82					
Cost Constraint (unfenced)	3,58	0,70					
<b>8th factor: Majority of House Types</b>	<b>3,66</b>		<b>0,89</b>	<b>0,40</b>	<b>1,54</b>	<b>4,28</b>	<b>66,23</b>
Majority of House Types (fenced and unfenced)	3,11	0,80					
Presence of security guard (fenced)	4,21	0,51					
<b>9th factor: Non-Home Owner</b>	<b>3,21</b>		<b>1,39</b>	<b>-</b>	<b>1,41</b>	<b>3,93</b>	<b>70,16</b>
Non-home owner (fenced and unfenced)	3,21	0,68					

The analysis results show that nine latent variables represent environmental/place quality factors in fenced and unfenced houses. The nine latent variables are unfenced security, fenced security, unfenced convenience, area boundaries, access and parking, social interaction, owner limitations, the majority of house types, and non-homeowners. From the results of factor analysis, it can be stated that the occupants of the house still feel the quality of security from a house that is non-fenced, such as security from strangers, crime, small children's activities, storing vehicles, disturbance of wild animals, and there is a guard from housing security. Likewise, the occupants of the house feel the security qualities of a fenced house, such as the security of storing vehicles, the activity of small children, disturbance from wild animals, crime, strangers, privacy security, and ease of access. Residents of the house still feel the quality of comfort from a house that is unfenced, such as giving a neat, aesthetic impression while still providing comfort and privacy. Fences are an important element as a barrier to areas in a house, such as dividing private areas and between house sites and roads. The presence or absence of a fence also affects the quality of social interaction desired by the house's occupants because the fence can provide boundaries for socializing. The absence of a fence makes socialising easier. The absence of a fence is also one of the reasons for occupants' limitations to building fences at home, such as narrow land and cost constraints. The majority of house types in the occupants'

neighbourhood also influence the selection of designs for fenced or non-fenced houses, such as neighbours where the majority of house types are fenced or not fenced, and the presence or absence of security also influences the choice of house type. The non-homeowner factor does not get Cronbach's alpha results, so its reliability cannot be tested.

The meaning of comfort and safety in the occupants' perspective regarding fenced and unfenced houses based on the quality factor of the residential environment can be seen from the influence of the level of security (fenced and non-fenced security), comfort (unfenced comfort), territoriality and ownership (territorial boundaries, owner limitations, non-homeowners), accessibility (access and parking), social interaction, and residential location (the majority of house types). These six factors can build the resilience of residents in the dwelling they are currently living in to reduce the phenomenon of abandoned houses.

Occupants' activities in the forecourt of the house

The results of the analysis of the main components of occupant activity in the forecourt of fenced and unfenced houses found five main components with an eigenvalue greater than one (with a cumulative percentage of 67.06%). These results are considered sufficient to describe and represent the phenomenon of the measurable variables from the activities of occupants in the front yard of the fenced and non-fenced houses.

The latent variables resulting from the factor analysis are shown in [table 4](#).

**Table 4.** Analysis of occupant activity factors on the forecourt in fenced and unfenced house

Measured variables	Mean	Factor Loading	Standard Deviation	Cronbach's $\alpha$	Eigenvalue /Variance	Percentage of Variance	Cum Percentage
<b>1st factor: Refreshing</b>	<b>3,05</b>		<b>0,94</b>	<b>0,89</b>	<b>4,16</b>	<b>18,09</b>	<b>18,09</b>
Relaxing	3,31	0,86					
Enjoying the surroundings	3,39	0,83					
Sunbathing	3,11	0,81					
Hanging out	2,95	0,70					
Listening to the music	2,49	0,58					
<b>2nd factor: productive activities</b>	<b>3,53</b>		<b>1,02</b>	<b>0,82</b>	<b>3,57</b>	<b>15,50</b>	<b>33,59</b>
Sweeping	3,56	0,75					
Storing/parking the Vehicle	3,96	0,75					
Cleaning up	3,61	0,74					
Waiting	2,98	0,52					
<b>3rd factor: Entertainment Activities</b>	<b>2,79</b>		<b>0,85</b>	<b>0,85</b>	<b>3,09</b>	<b>13,45</b>	<b>47,04</b>
Gardening	2,56	0,67					
Taking pictures	2,59	0,66					
Physical exercise	2,71	0,60					
Playing	3,01	0,59					
Interacting with neighbors	2,92	0,58					
Chatting	2,94	0,52					
<b>4th factor: Daily activities</b>	<b>2,29</b>		<b>0,98</b>	<b>0,79</b>	<b>2,89</b>	<b>12,57</b>	<b>59,61</b>
Washing clothes	1,77	0,79					
Working	2,11	0,74					
Eating & drinking	2,91	0,61					
Receiving guests	2,38	0,55					
<b>5th factor: Routine Activities</b>	<b>2,70</b>		<b>1,11</b>	<b>0,54</b>	<b>1,71</b>	<b>7,45</b>	<b>67,06</b>
Feeding Animals	2,52	0,78					
Drying Goods	2,89	0,57					

The analysis results show that five latent variables represent occupant activity factors in the forecourt of the fenced and unfenced houses. The five latent variables are refreshing, productive activities, entertainment activities, daily activities, and routine activities. From the results of factor analysis, refreshing helps residents in revitalizing the soul such as relaxing, enjoying the surrounding atmosphere, sunbathing, hanging out, and listening to music. Productive activities are also carried out by residents, such as sweeping, storing/parking vehicles, cleaning, and waiting in the forecourt of the house. Entertainment activities are also carried out by residents, regardless of the fenced or non-fenced design of the house, such as gardening, taking photos, sports, playing, interacting with neighbours, and chatting. Daily activities carried

out in the forecourt of the house with or without a fence, such as washing clothes, doing chores/work, eating and drinking, and receiving guests. Routine activities such as feeding animals and drying goods are also carried out in fenced or unfenced houses.

The meaning of comfort and safety in the occupants' perspective regarding fenced and unfenced housing based on occupant activity factors on the forecourt of their house can be seen from the influence of the level of refreshing activities (refreshing and entertainment) and daily activities (productive, daily, and routine) that can be done every day freely without any disturbance. These two factors also build the resilience of residents in the occupants they are currently living in to reduce the phenomenon of abandoned houses.

Types of disturbances experienced in fenced and unfenced houses

The results of the analysis of the main components of the type of disturbance experienced by fenced and unfenced houses, found four main components with an eigenvalue

greater than one (with a cumulative percentage of 60.85%). These results are considered sufficient to describe and represent the measurable variable phenomenon of the types of disturbance experienced by fenced and unfenced houses. The latent variables resulting from the factor analysis are shown in [table 5](#).

**Table 5.** Factor analysis of types of disturbance experienced in fenced and unfenced houses

Measured Variable	Mean	Factor Loading	Standard Deviation	Cronbach's $\alpha$	Eigenvalue /Variance	Percentage of Variance	Cum Percentage
<b>1st factor: Disturbance of comfort</b>	<b>2,21</b>		<b>0,89</b>	<b>0,84</b>	<b>3,26</b>	<b>20,35</b>	<b>20,35</b>
Strangers come and go	2,04	0,76					
Plants are damaged	1,80	0,75					
Littering	2,01	0,74					
Private parking area is used by strangers	2,27	0,70					
Forecourt is used by stranger	2,76	0,62					
Less privacy	2,37	0,57					
<b>2nd factor: disturbance of security/safety</b>	<b>1,86</b>		<b>0,75</b>	<b>0,76</b>	<b>2,49</b>	<b>15,54</b>	<b>35,89</b>
Fruit theft	1,76	0,77					
Strangers (beggars)	2,81	0,75					
Theft of personal items	1,61	0,64					
Theft of personal vehicle	1,26	0,57					
<b>3rd factor: Disturbance of facility</b>	<b>1,34</b>		<b>0,60</b>	<b>0,73</b>	<b>2,21</b>	<b>13,78</b>	<b>49,68</b>
Attack from the strangers	1,29	0,84					
Stranger turns off switch	1,27	0,83					
Stranger climbing house fence	1,45	0,51					
<b>4th factor: Disturbance of animal</b>	<b>2,79</b>		<b>1,06</b>	<b>0,57</b>	<b>1,79</b>	<b>11,18</b>	<b>60,85</b>
Animals disturb trash cans	2,51	0,74					
Entry of pets/wild animals	3,08	0,68					

The results of the analysis show that there are four latent variables that represent the type of disturbance experienced by fenced and unfenced houses. The four latent variables are disturbance of comfort, security, facility, and animal. From the results of the factor analysis, it can be stated that disturbance of comfort is a factor that affects the comfort of residents to do activities in the forecourt of the house such as strangers going in and out, destroying plants, littering, strangers parking carelessly, neighbours using the forecourt to play, and lack of privacy. Security disturbances also affect the choice of fenced or unfenced houses, such as personal fruit theft, strangers who begs for donations (beggars), theft of personal belongings, and theft of private vehicles. Facilities disturbance is also unavoidable even if

the house has a fence or does not have a fence such as attacks from strangers, strangers turning off switches, and strangers climbing fences. Animal disturbances also often interfere with activities in the forecourt of the house with a fence or unfenced, such as garbage cans being disturbed by animals and pets/wild animals entering the yard.

The meaning of comfort and security can be disrupted in the occupants' perspective regarding fenced and unfenced housing based on the type of disturbance experienced in the dwelling. This can be seen from the influence of the level of disturbance of comfort (comfort and animal disturbance) and theft and attack security disturbance (security and facility disturbance), all of which comes from external factors. Both of

these factors can interfere with the resilience of residents in the house they are currently living in so that it can increase the phenomenon of abandoned houses due to the influence of surrounding environmental factors that interfere with the safety and comfort of the house.

The will to stay

The results of the main component analysis of the willingness to stay in fenced and unfenced

houses found two main components with an eigenvalue greater than one (with a cumulative percentage of 66.32%). These results are considered sufficient to describe and represent the phenomenon of the measurable variable of the desire to stay in fenced and non-fenced houses. The latent variables resulting from the factor analysis are shown in [table 6](#).

**Table 6.** Factor analysis of willingness to stay in fenced and unfenced houses

Measured variables	Mean	Factor Loading	Standard Deviation	Cronbach's $\alpha$	Eigenvalue /Variance	Percentage of Variance	Cum Percentage
<b>1st factor: willingness to stay</b>	<b>4,09</b>		<b>0,91</b>	<b>0,82</b>	<b>2,38</b>	<b>39,75</b>	<b>39,75</b>
Already feel comfortable	4,36	0,89					
Willing to stay	4,11	0,88					
Did not plan to change house types	3,81	0,83					
<b>2nd factor: Frequency of activity</b>	<b>3,21</b>		<b>1,01</b>	<b>0,74</b>	<b>1,59</b>	<b>26,57</b>	<b>66,32</b>
Intensity	3,17	0,84					
Duration	3,26	0,82					

The analysis results show that two latent variables represent the willingness to stay in a fenced and non-fenced house. The two latent variables are the willingness to stay and the intensity of activity. From the factor analysis results, it can be stated that the occupants' willingness to stay in fenced and unfenced housing is influenced by the factors that they already feel comfortable with their house, willingness to stay, and do not plan to change the house type. The residents' desire to stay also influences the frequency of activities in the house's forecourt in terms of intensity and duration.

#### Multivariate regression analysis

From the results of the factor analysis above, the willingness to stay is a latent factor affecting the causal factors of quality, activity, and environmental disturbances seen from the number of respondents who feel comfortable, willing to stay, and do not want to change the type of house they are currently living in. From the results of the factor analysis above, the desire to stay is a latent factor affecting the causal factors of quality, activity, and environmental disturbances seen from the number of respondents who feel comfortable, willing to stay, and do not plan to change the type of house they are currently living

in. The latent factor resulting from the intensity of the activity also influences the causal factor of quality, activity, and environmental disturbance seen from the frequent intensity and duration of what respondents do when they are free to do activities in the forecourt of the house.

All latent factors, from the quality of the environment/place, occupants' activities in the forecourt of the house, the type of disturbance experienced, and the willingness to stay, were analyzed using multivariate regression analysis to determine the causal relationship between the four latent factors. According to the principle of causation, the independent variable must be the predecessor of the dependent variable. Residents can feel the desire to stay in a fenced or unfenced house after knowing and understanding the quality of the environment in a specific place, having carried out activities in that place, and experiencing types of disturbances in the house. Therefore, in this study, the latent factors of the quality of the environment/place, the activities of the occupants in the front yard of the house, and the type of disturbance experienced are treated as independent variables. In contrast, the latent factors of the willingness to stay and the intensity of activities are treated as the dependent variable. The results of the multivariate regression analysis are shown in [table 7](#).

**Table 7.** Result of multivariate regression analysis

Latent Variable (Cause)	Willingness to stay		Frequency of Activity	
	Rsq= 0,31	Pvalue 0,0001	Rsq=0,45	Pvalue <,0001
	$\beta$	P	$\beta$	P
Safety in unfenced house	0,21*	0,01	-0,04	0,61
Safety in fenced house	0,15	0,05	0,21**	0,003
Comfort in unfenced house	0,14	0,12	-0,01	0,86
Boundary of Territory	0,04	0,66	0,001	0,99
Access and parking	-0,09	0,26	-0,09	0,24
Social interaction	-0,08	0,31	0,12	0,09
Owner's Limitations	0,14	0,08	0,11	0,11
Majority of house types	0,03	0,68	0,07	0,35
Non-home owner	-0,19*	0,02	-0,07	0,30
Refreshing	0,08	0,32	0,44***	<,0001
Productive activities	-0,03	0,73	0,02	0,80
Entertainment activities	0,23**	0,003	0,25***	0,0005
Daily activities	-0,02	0,84	0,21*	0,01
Routine activities	0,06	0,46	0,04	0,58
Disturbance of comfort	-0,35***	<,0001	0,12	0,12
Disturbance of safety	0,08	0,36	0,02	0,78
Disturbance of facility	-0,07	0,36	0,05	0,51
Disturbance of animals	-0,07	0,42	0,03	0,65

Note: \* $p < 0,05$ ; \*\* $p < 0,01$ ; \*\*\* $p < 0,001$

The results of the multivariate regression analysis above show a significant causal relationship between entertainment activities ( $\beta = 0.23$ ,  $p = 0.003$ ) and unfenced security ( $\beta = 0.21$ ,  $p = 0.01$ ) as the dominant factor causing residents' willingness to remain in a fenced or unfenced house. On the inconvenience factor ( $\beta = -0.35$ ,  $p = <.0001$ ) and non-homeowners ( $\beta = -0.19$ ,  $p = 0.02$ ) have a negative R square value, so the results are considered zero and considered not suitable for analyzed. There is also a significant causal relationship between refreshing ( $\beta = 0.44$ ,  $p = <.0001$ ), entertainment activities ( $\beta = 0.25$ ,  $p = 0.0005$ ), fenced security ( $\beta = 0.21$ ,  $p = 0.003$ ), and daily activities ( $\beta = 0.21$ ,  $p = 0.01$ ) as the dominant factor causing the intensity of activities carried out in the forecourt of the fenced and non-fenced houses.

#### Stepwise regression analysis

Based on the results of the multivariate regression analysis above, there are insignificant latent factors, so a regression analysis is performed stepwise. Multivariate regression analysis was performed again by separating the two latent consequential factors. In the first multivariate regression analysis, latent factors were selected from the stepwise results, namely unfenced security, fenced security, entertainment activities, and disturbance of comfort were treated as independent variables. In contrast, latent

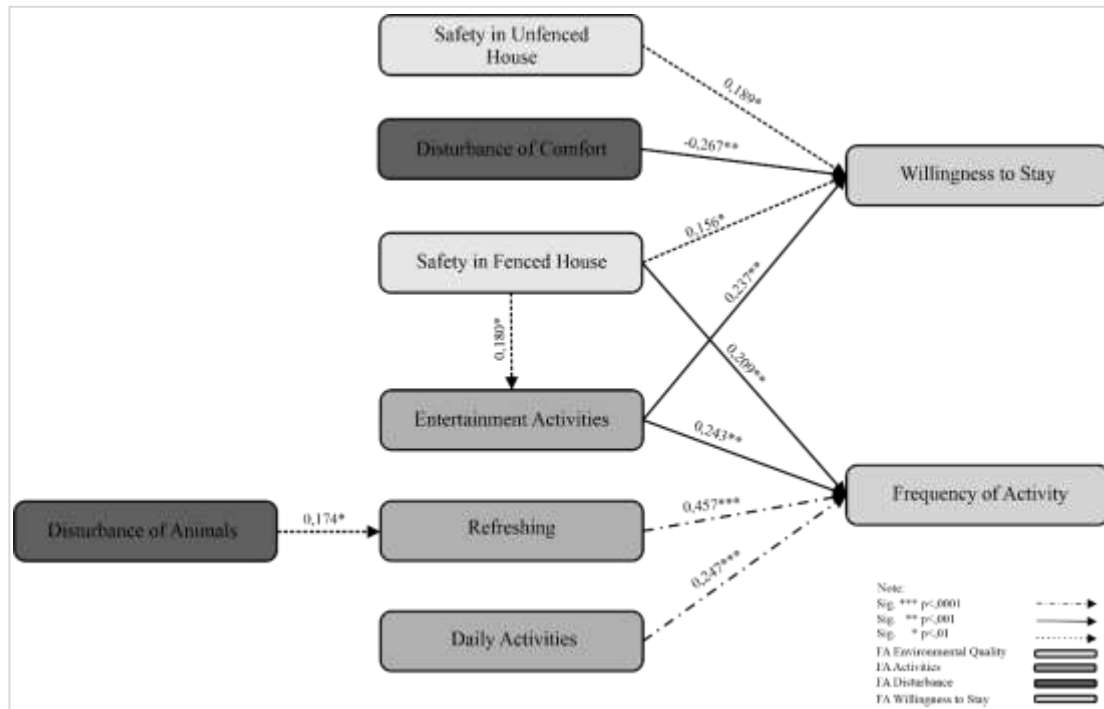
factors from the desire to stay were treated as dependent variables. The multivariate regression analysis showed a significant causal relationship between impaired comfort ( $\beta = -0.27$ ,  $p = 0.0007$ ), entertainment activities ( $\beta = 0.24$ ,  $p = 0.0003$ ), unfenced security ( $\beta = 0.19$ ,  $p = 0.02$ ), and fenced security ( $\beta = 0.16$ ,  $p = 0.05$ ) as the dominant factors causing the residents' willingness to stay in a fenced or unfenced house. The highest latent factor influencing the effect of willingness to stay is the latent factor of entertainment activities. Therefore, a stepwise analysis is carried out again to find the latent factors that most influence the latent factors of entertainment activities. The results show that the safety latent factor of the fence has a significant relationship between entertainment activities, namely  $\beta = 0.18$   $p = 0.03$ , through the results of bivariate regression analysis.

In the second multivariate regression analysis, latent factors were selected from the stepwise results, namely fenced security, refreshing, entertainment activities, and daily activities were treated as independent variables. In contrast, latent factors from the intensity of activities carried out in the forecourt of the fenced and unfenced houses were treated as the dependent variable. The results of the multivariate regression analysis above show a significant causal relationship between refreshing ( $\beta = 0.46$ ,  $p = <.0001$ ), daily activities ( $\beta = 0.25$ ,  $p = 0.0004$ ),

entertainment activities ( $\beta = 0.24, p = 0.0005$ ), and fenced security ( $\beta = 0.21, p = 0.003$ ) as the dominant factors causing the intensity of activities carried out in the front yard of the fenced and unfenced houses. The highest latent factor influencing the activity intensity factor is the refreshing latent factor. Therefore, another stepwise analysis was performed to find the latent factor that most influences the latent refreshing factor. It was found that the latent factor of animal disturbance had a significant relationship between

refreshing, namely  $\beta = 0.17, p = 0.04$  through the results of the regression analysis.

From the result of the analysis, it can be seen that entertainment activities strongly influence both latent factors, namely the latent factor of the willingness to stay and the intensity of activities in fenced and unfenced houses. To simplify the explanation, a model is created that represents the results of the multivariate regression analysis in figure 1.



**Figure 1.** The causal relationship between the quality of the environment/place, the activities of the occupants in the forecourt of the house, the type of disturbance experienced, and the willingness to stay

The results of the analysis above shows that entertainment activities have a strong influence on the factor of wanting to stay ( $\beta = 0.24, p = 0.0003$ ) and refreshing activities have a strong influence on the factor of activity intensity ( $\beta = 0.46, p = <, 0001$ ). Entertainment activities also strongly influence the activity intensity factor ( $\beta = 0.24, p = 0.0005$ ). The comfort disturbance factor has a negative R square value ( $\beta = -0.27, p = 0.0007$ ), so the result is considered zero and has no effect on the willingness to stay in their house.

## Conclusion

This study obtained nine latent variables representing the quality of the environment/place, five latent variables representing the activities of the occupants in the forecourt, four latent variables representing the type of disturbance experienced, and two latent variables representing the desire to stay. After conducting a multivariate regression analysis, it was found that the presence of a fence or not having a fence did not affect the meaning of comfort and safety in the occupancy occupied. The environmental disturbance factor also does not affect the comfort and safety of the occupants in choosing the fenced or unfenced

housing where the occupants already understand the situation that is being completely confined. This is very closely related to the pandemic situation when the research was conducted. The meaning of security and comfort from the occupants' perspective on their dwellings is strongly influenced by the activity factors of the occupants on the forecourt of their dwelling, which is seen from the strong influence on refreshing activities (refreshing and entertainment) and daily activities (productive, daily and routine). These two factors can build the resilience of residents in the dwelling they are currently living in to reduce the phenomenon of abandoned houses. Even though this data makes a comparison between fenced and non-fenced houses, the two things do not make a difference, instead, it shows the similarity that in both types of houses, the meaning of security and comfort is more influenced by the ability of the occupants themselves to adapt to carrying out activities in the house or inside its territory.

Presently, the design of unfenced houses is a choice in proportion to the number of people who choose fenced housing designs. The choice of housing design is closely related to research results which show that the meaning of safety and comfort does not affect the presence or absence of fences. Unfenced housing plans can be an option for establishing the quality of social integrity in a residential area. The role of housing planners and designers is needed to continue to grow knowledge in the community by presenting designs that rely on something other than fences with the intention of increasing social integration in residential areas. Increased social integration can make the function of the fence only as passive protection in the hope that residents will prioritize adding green space to their homes and improve the visual connection between housing, roads and the social environment of the residence for the better.

## Recommendation

The research findings are less representative because the data were taken using the non-random sampling method, and the number of respondents is somehow limited. By using the non-random sampling method and the range of areas, situations and conditions in different areas, one must have different thoughts. We recommend that

data collection be done through a random sampling method to increase the reliability and level of generalization of data.

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**Danti Arinta Hapsari** contributed to the research concepts preparation, methodologies, investigations, data analysis, visualization, articles drafting and revisions.

**Hanson Endra Kusuma** contribute to the research concepts preparation and literature reviews, data analysis, of article drafts preparation and validation.

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