Housing Attribute Preferences in Bandung City: A Comparison Between Generation X, Y, Z

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Abstract

Each generation encounters distinct social, economic, cultural, and technological contexts specific to their era. Moreover, their lifestyles vary, resulting in disparate housing preferences. This study analyzes five housing attribute preferences of Generation X, Generation Y, and Generation Z: *Economic attribute*, *location and accessibility attribute*, *physical attribute*, *environment attribute*, and *social attribute*. The research uses a stated preference approach. The study uses a mixed method and a stated preference approach while collecting data by online questionnaire. Three analytical techniques are employed in this research: correspondence analysis to identify differences in dwelling type preferences among generations, PCA and FA to identify the underlying housing attribute influencing housing preferences, and ANOVA to analyze housing attribute dimensions with significant differences among generations. The analysis result reveals that each generation tends to prefer Landed Housing. The housing attribute dimensions that are the main priority among generations are *Utilities, Infrastructure,* and *Environmental Quality*. Meanwhile, significant differences in housing preferences between Generation X, Generation Y, and Generation Z are found in the *space comfort* and *social interaction* dimensions.

INTRODUCTION

Housing and settlements are influenced by the society preferences. According to the Hierarchy of Needs theory proposed by Maslow (1954) that "housing is a physical structure that fulfills basic human needs such as protection from weather and disturbances. Additionally, it also fulfills further human needs, such as fulfilling someone's ideals and values or memories." Rapoport (1969) asserts that the structure and form of a house are considered a manifestation of the resident's values and cultural behaviors. Jansen et al. (2011) state that the values or behaviors of a society can also be referred to as common sense. So, the common sense of each generation also impacts their general preferences for housing choices.

Housing preferences are one of the factors that influence housing development in a city. In housing provision, there is often a mismatch between housing supply and housing demand, resulting in a significant number of unsold properties in the housing market (Ismail & Mohamed Shaari, 2020; Tan & Khong, 2012). Ekananda (2019) states that developers must understand the housing market's target needs to avoid the gaps. One of them is understanding the resident's preferences in choosing a house, thereby enabling effective housing supply. Besides that, Canter (1974) said that preferences in architecture are included in behavioral studies that explain and predict everyday human behavior. Understanding housing preferences will make it easier for developers to provide housing products that align with the target market. However, each resident has different preferences when choosing their housing (Pratama & Idajati, 2022).

Housing choice is related to various housing attributes that influence housing preferences. The most common factors influencing housing preferences are housing attributes, location, and the environment (Hurtubia et al., 2010; Ismail & Mohamed Shaari, 2020; Tan, 2012; Wang & Li, 2006). Louvierè & Timmermans (1990) categorized housing attributes into four groups, including physical aspects, environmental aspects, socio-economic aspects, and location aspects. Andoni & Kusuma (2016), Syafrina et al. (2018), and Tang et al. (2022a) added social relationship

aspects to housing preferences. Puspitasari et al. (2022) dan Nadiya (2017) included economic aspects such as housing prices. In addition, housing attributes that influence housing preferences also influenced by the generation they live in.

Each generation has different housing preferences. Generation is a population identified by birth year or based on age (Ismail & Mohamed Shaari, 2020). Most studies on housing preferences tend to focus on Generation Y and Generation Z. This is because both of these generations currently dominate the world's population and are entering their productive years, including in Indonesia (Tang et al., 2022a). In the next 5 to 10 years, Generation Z will become a potential future housing market as buyers for live-in or investment purposes. Generation Y, called millennial, are individuals born between 1981 and 1994. Meanwhile, Generation Z was born from 1995 to 2012 and called Pos-Millennials. In addition to these two generations, there is the generation before them, known as Generation X, born between 1961 and 1980 (Dwidienawati & Gandasari, 2018; Putra, 2016; Stillman & Stillman, 2017). This generation tends to rarely be researched regarding housing preferences because they assume they already own a house. Therefore, this research will compare three generations, namely Generation X, Generation Y, and Generation Z.

Due to the limited urban land availability, leading to high land prices, housing costs have also risen. In urban areas, the prices of landed houses have become increasingly unaffordable, leading to the development of alternative housing types such as apartments or condominiums. Generation Y and Z, belonging to the young adult demographic, face significant challenges in homeownership due to excessively high housing prices. Meanwhile, Generation X, who already own or rent houses, whether in the form of landed or vertical housing, have differing housing preferences. This discrepancy in housing preferences among generations highlights the need to consider housing type preferences and prices for efficient urban land use and targeted housing development.

Demographics and housing themes have been studied and debated widely, but previous research has tended to examine issues of specific generations or age groups. Comprehensive studies on housing preferences across generation are needed to narrow the gap between housing supply and housing demand. Therefore, a study is necessary to understand housing preferences that align with the characteristics of each generation. Based on this background, this research aims to provide a general overview of the differences housing preferences among Generation X, Generation Y, and Generation Z in Bandung City. Furthermore, housing preferences will be examined through housing attributes, with a focus on five attributes: *economic attribute*, *accessibility and location attribute, the environment attribute*, and *social attributes*. The main results of this research will demonstrate how preferences vary among generations. The main objectives of this study are: 1) Compare housing types between generations in Indonesia; 2) Classify the important housing attributes between generations; and 3) Explaining the differences in housing attribute preferences among generations.

METHODS

This study used a mixed-method approach, with qualitative and quantitative analysis methods (Creswell & Creswell, 2018). Qualitative results provided insight into reason and factors that influence people's preferences in choosing housing. The variables obtained from the first stage of qualitative research were then used to develop a framework for the second stage of the quantitative analysis method. Explanatory quantitative methods were used to identify the factors that most influence housing preference.

First Stage Study

The first stage of the study used an exploratory qualitative method with a grounded theory approach. Grounded theory, as defined by Creswell and Creswell (2018) is a qualitative research methodology aimed at deriving a comprehensive understanding or theory of a phenomenon, process, action, or interaction, based on insights provided by respondents. This stage aimed to research new perspectives on the housing preferences of Generation X, Generation Y, and Generation Z, along with the underlying influencing factors. The factors were obtained from 62 articles discussing housing preferences among various generations in urban communities in cities in Indonesia. These articles are sourced from various online journal repositories using keywords: *preference*, *housing attribute*, *generation X*, *generation Y*, *generation Z*. Creswell & Creswell (2018) included this type of data collection into private document analysis.

This stage consists of three phases content analysis: open coding, axial coding, and selective coding. Open coding is employed to identify housing preference attributes and factors. Axial coding is the stage aimed at generating and organizing relevant factors. Then, factors that mutually influence each other are categorized in the selective coding analysis. This process results in five housing attributes: *housing type, economic attribute*, *location and accessibility attribute*, *physical attribute*, *environment attribute*, and *social attribute*.

Second Stage Study

In the second stage, quantitative correlational methods were used to identify the cause-and-effect relationship between housing preferences and Generation X, Generation Y, and Generation Z in Bandung City. Data collection was carried out using an online survey with non-random sampling (purposive & snowball sampling). Respondents come from generations X, Y, Z who live in Bandung City. The questionnaire was designed using closed-ended questions and the Likert method with a scale from 1 to 5. The online questionnaires were distributed from April 26 to May 14 2023. The total number of respondents was 211 respondents. Example of questions from the online questionnaire can be seen in Table 1.

Table 1. Sample of Closed-ended Questions

Attribute	Scale						
Accessibility	I consider the location of the house first when buying a house.						
	Strongly Disagree	1	2	3	4	5	Strongly Agree
Environment	Prioritizing the safety of the neighborhood where the house is located						
	Strongly Disagree	1	2	3	4	5	Strongly Agree
Social Interaction	Prioritize housing that is easy to interact with neighbors.						
	Strongly Disagree	1	2	3	4	5	Strongly Agree

The collected data was analyzed quantitatively using three methods: correspondence analysis, principal component analysis, and factor analysis, as well as analysis of variance (ANOVA). Data was processed using JMP Pro 13.0 software. with the steps outlined below.
a. Bivariate correspondence analysis is conducted to reveal the relationship between generation categories as the x-axis and housing preference categories as the y-axis.
b. Principal Component Analysis (PCA) is used to classify variables into dimensions based on eigenvalues. The determination of principal components follows the Kaiser Index rule (Kaiser, 1960).
c. Factor analysis (FA) identified dimensions and latent variables by representing interrelated variables through small factors. Orthogonal varimax rotation ensures uncorrelation, yielding loading scores that signify each variable's contribution to a dimension. High loading scores (>0.5) indicate significant contributions and lead to variable grouping (Kaiser, 1958, 1960). FA also reveals eigenvalues, variance percentages, and cumulative percentages for each dimension, with mean values and standard deviations analyzed post-rotation.
d. Validation and reliability in this research are evaluated using Pearson's correlation at a significance level of 5% and Cronbach's Alpha formula. A variable is considered reliable if Cronbach's Alpha exceeds 0.60.
e. ANOVA compares preferences across dimensions among different generations. Differences are illustrated through a "mean diamond" diagram, showing average differences between generations and dimensions, with the x-axis representing generation and the y-axis denoting dimension.

RESULTS AND DISCUSSION

Housing Type Preferences

In the open-ended questionnaire section, respondents were asked about the type of housing they would like to reside in, with three options provided: landed housing in suburban areas, landed housing in the rural area, and vertical housing (flats/apartments) in urban area. From 211 respondents, there were 75 respondents from Generation X, 49 from Generation Y, and 87 from Generation Z. Based on the correspondence analysis results in Table 2, it is evident that the housing type preference of Generation X mostly prefer landed housing in rural area, with 49 respondents (23.22%). For Generation Y, the choices between a landed house in suburban and a landed house in rural area have an equal number of respondents. Meanwhile, in Generation Z, the highest number of respondents prefer a landed house in the suburban areas, with 47 respondents (22.27%).

The analysis indicates that each generation still tends to prefer landed housing. However, this is in line with the study by Ekananda & Marcillia (2019) in Yogyakarta and Nadiya (2017) in West Jakarta, which found that Generation Y and Z still prefer landed housing. The difference in the results of this study is the location. Generation X prefers landed houses in rural areas, while Generation Z prefers landed housing in suburban areas. In the study by Tang et al. (2022b), it is explained that social interaction flexibility and land ownership are the most dominant factors for Generation Y and Z in choosing landed housing.

Currently, housing developer are starting to providing vertical housing rather than landed housing (Jacobus, 2010). The increasing land prices are making developers in urban area choose vertical development (Ramadhani et al., 2021). However, study results indicate that vertical housing in urban area has the smallest percentage (7,58%).

There is a tendency among Generation Z to choose vertical housing in urban areas compared to other generations. This contrasts with the findings of Lachman & Brett (2015) and Nadiya (2017), which suggested that Generation Y prefers vertical housing. Referring to previous research on factors influencing apartment purchases, location, accessibility, and amenities are the main reasons respondents choose vertical housing in urban areas (Tang et al., 2022b).

Table 2. Dwelling Type Preferences Diagram

Count Total % Col % Row %	Landed Housing In Suburban Area	Landed Housing In Rural Area	Vertical Housing (Flats/ Apartments) In Urban Area	Total
Generation X	22	49	4	75
	10,43	23,22	1,90	35,55
	23,66	48,04	25,00	
	29,33	65,33	5,33	
Generation Y	24	24	1	49
	11,37	11,37	0,47	23,22
	25,81	23,53	6,25	
	48,98	48,98	2,04	
Generation Z	47	29	11	87
	22,27	13,74	5,21	41,23
	50,54	28,43	68,75	
	54,02	33,33	12,64	
Total	93	102	16	211
	44,08	48,34	7,58	

Housing Attribute Preferences

This section will explain housing attributes that can influence respondents' preferences in choosing a house type. From previous qualitative study, five housing attributes were obtained: *economic attributes*, *location and accessibility attributes*, *physical attributes*, *environment attributes*, and *social attributes* (see Table 3). Then, each attribute described into dimension variables from the results of principal component analysis (PCA) and factor analysis (FA). There are 16 (sixteen) dimensions were considered capable of explaining the phenomenon with 65 measured variables. After conducting reliability testing with Cronbach's alpha, four dimension had values below 0.60: *housing finance*, *development systems*, *housing tenure*, and *social characteristics*. So, the four dimensions will not be used in the ANOVA analysis. A descriptive analysis was used to indicate the most dimensions considered among generations based on mean values. The analysis results can be seen in Table 3.

Based on the PCA and FA results (Table 2), *Utilities* (mean 4,67), *infrastructure* (mean 4,61), and *environmental quality* (mean 4,58), dimension with the highest average value, are most significantly influence housing preferences of all generations. Meanwhile, *Housing Finance* (mean 2,95), *Artificial Space Comfort* (mean 2,45), and *Housing Tenure* (mean 2,17) are dimension that have a low mean value. This also indicates that these three dimensions are generally not considered very significant to respondents on preferences in choosing housing type.

In the *utilities* dimension, variables with high value found in *Availability of Water Supply* (mean 4,78) and *Quality of Electric Network* (mean 4,72). Generation X, Generation Y, and Generation Z agree that utilities are the first housing attribute they consider when choose housing. In the *infrastructure* dimension, *The Availability of Sewage Drainage* (mean 4,67) and *Availability of Communal Waste Disposal* (mean 4,67) are the most variables that influence the respondent's preferences. According to Syafrina et al. (2018), utilities and infrastructure dimension are one of the significant factors in choosing a housing environment. Doxiadis (1970) also explained that infrastructure in a housing environment aims to provide convenience for residents because it is a fundamental element of a settlement that must be fulfilled and functions as an operational factor in the area. In the dimensions of *environment quality*, *Safety Place* (mean 4,72) and *Quiet Place* (mean 4,58) variables have the highest mean values. This is consistent with the findings of Tang et al. (2022a) and Puspitasari et al. (2022), which revealed that security is the most significant factor in the preferences of Generations Y and Z when choosing the type of housing. Meanwhile, in the study by Syafrina et al. (2018), a quiet environment was the dominant factor in the preferences for the housing environment people want to live in. On other hand, Ramadhani et al.(2021) stated that people prefer to shop around looking for a house rather than searching online on a website, and also choose to buy owner-occupied housing rather than rental housing. In line with the research results that in the *housing tenure* dimension, which has the smallest mean value, many respondents choose *Owner-Occupied Houses* (mean 2,76) over *rental house* (mean 1,56).

Table 3. The Result of Housing Attribute Dimension

Housing Attribute	Mean	Factor Loading	Eigen Value	% of variance	Cum %	Std	α
Economic Attributes							
Dimension 1: Housing Price System	**4,07**		1,84	18,40	18,40	0,67	0,62
Term of payment	4,00	0,82					
Down Payment	4,08	0,82					
Self-help Housing	4,14	0,54					
Dimension 2: Housing Finance	**2,95**		1,74	17,40	35,80	0,96	0,59
Mortgage Loan	2,82	0,77					
Subsidized Housing	3,09	0,75					
Dimension 3: Development System	**3,66**		1,28	12,78	48,58	0,64	0,30
Move-In-Ready House	3,99	0,76					
Use Reputable Developer	2,90	0,62					
Hire an Architect	4,08	0,50					
Dimension 4: Housing Tenure	**2,17**		1,10	10,99	59,57	0,73	0,13
Rental House	1,58	0,85					
Owner-Occupied House	2,76	0,53					
Location and Accessibility Attributes							
Dimension 1: Accessibility	**4,32**		3,74	33,99	33,99	0,54	0,63
Access to schools	4,44	0,80					
Access to shopping and leisure services	4,26	0,79					
Access to hospital/clinic	4,48	0,77					
Access to city center	3,75	0,72					
Access to religious Facilities	4,54	0,68					
Access to workplace	4,39	0,63					
Access to public transport	4,40	0,59					
Dimension 2: Location	**4,31**		2,09	19,04	53,03	0,54	0,85
Availability of Pedestrian Path	4,20	0,77					
Strategic location	4,40	0,68					
heavy traffic free	4,55	0,61					
Location on a main street	4,09	0,58					
Physical Attributes							
Dimension 1: Space Comfort	**4,20**		2,60	17,34	17,34	0,51	0,74
Wi-Fi Availability	4,11	0,70					
Interior Design	4,26	0,68					
Smart Home	3,68	0,59					
Natural Ventilation Systems	4,62	0,56					
Energy Saving System	4,24	0,51					
Natural Lighting System	4,56	0,51					
Exterior Design	3,95	0,50					
Dimension 2: Space Requirement	**4,05**		2,01	13,41	30,75	0,73	0,66
Number of rooms	4,11	0,80					
Size of house	3,98	0,78					
Dimension 3: Additional Spaces	**3,75**		1,96	13,07	43,81	0,64	0,63
Garden/Balcony	3,21	0,78					
Availability of Furniture	3,49	0,61					
Green space	4,28	0,57					
Size of Living room	4,03	0,48					
Dimension 4: Artificial Space Comfort	**2,45**		1,84	12,28	56,09	0,86	0,64
Additional Lighting System	2,10	0,82					
Additional AC System	2,79	0,76					
Environment Attributes							
Dimension 1: Utilities	**4,67**		5,06	24,08	24,08	0,44	0,93
Quality of Electric Network	4,72	0,82					
Condition of Road Surface	4,70	0,81					
Availability of Water Supply	4,78	0,77					
Availability of Fire Extinguishers	4,55	0,74					
Availability of Open Space	4,63	0,61					
Availability of Religious Area	4,69	0,59					
Quality of Drink Water	4,66	0,57					
Environmental Security	4,66	0,54					
Quality of Drainage	4,67	0,50					

Housing Attribute	Mean	Factor Loading	Eigen Value	% of variance	Cum %	Std	α
Dimension 2: Facilities	**4,44**		3,84	18,28	42,36	0,59	0,89
Availability of public services	4,41	0,85					
Availability of market	4,31	0,81					
Availability of health facilities	4,57	0,78					
Availability of school facilities	4,53	0,75					
Availability of sports facilities	4,38	0,63					
Dimension 3: Environment Quality	**4,58**		2,93	13,93	56,29	0,50	0,81
Quiet Place	4,58	0,84					
Environment Ambience	4,47	0,64					
Safety Place	4,72	0,60					
Comfort Place	4,56	0,53					
Dimension 4: Infrastructure	**4,61**		2,89	13,78	70,07	0,50	0,73
Road width	4,53	0,74					
Availability of Sewage Drainage	4,67	0,71					
Availability of Communal Waste Disposal	4,67	0,60					
Social Attributes							
Dimension 1: Social Interactions	**4,21**		3,22	40,31	40,31	0,62	0,84
Gotong-Royong	4,32	0,87					
Socializing with Neighbors	4,20	0,86					
Religious Environment	4,11	0,75					
Child-Friendly Environment	4,48	0,67					
Community Participation	3,94	0,66					
Dimension 2: Social characteristics	**3,21**		1,50	18,78	59,09	0,72	0,44
Housing as Prestige	2,35	0,84					
Diversity of Ethnic/Cultural/Religious Communities	3,54	0,59					
Neighborhood Near to Friends and Family	3,75	0,53					

For simplicity, the order of differences in housing attribute dimensions among Generation X, Generation Y, and Generation Z can be seen in Fig. 1. Two housing attribute dimensions have significantly different values among these three generations, *Social Interaction* and *Space Comfort*. Further discussion will be provided in the following subsection.
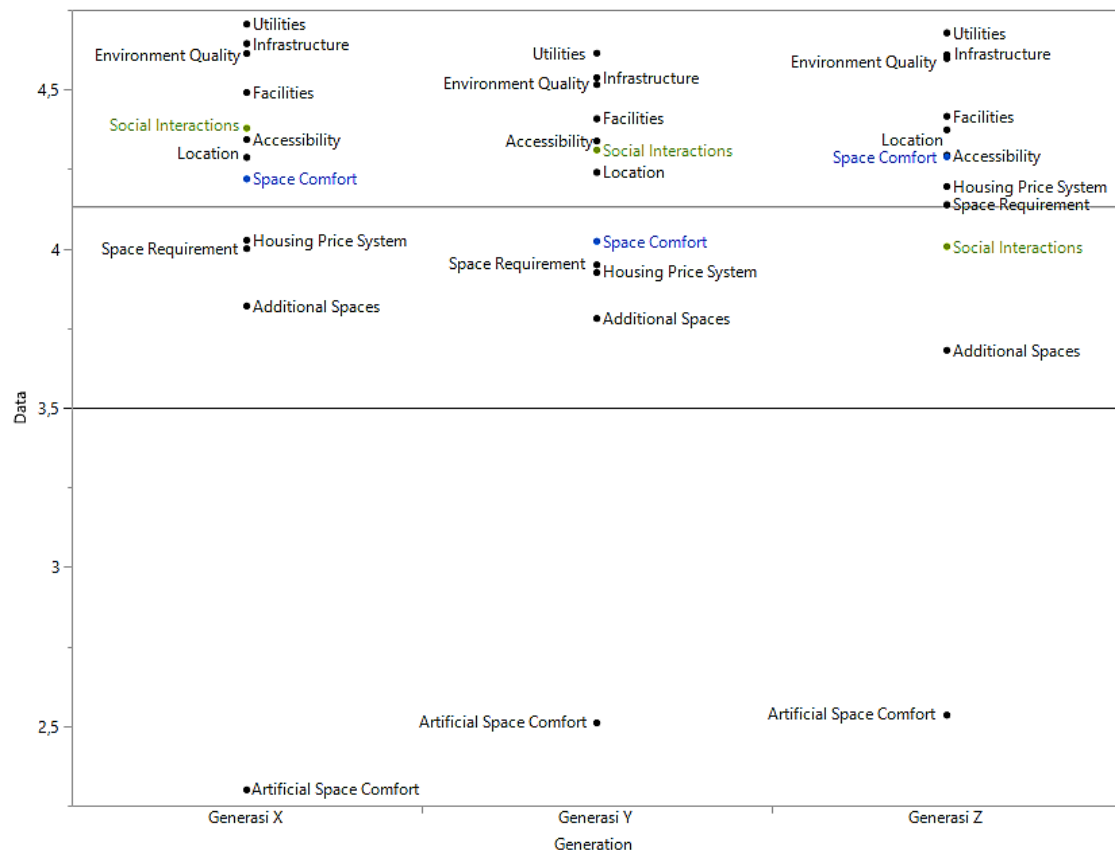

Fig. 1. Mean Value

Differences in Housing Attribute Preferences Between Generations

This section analyzes the comparison of dimensions for housing attribute preferences between generation X, generation Y, and generation Z using ANOVA analysis. Out of the 12 dimensions analyzed, only two dimensions show significant differences: *Space Comfort Dimension* with a significant value of 0,0131 and *Social Interactions Dimension* with a significant value of 0,0002. Dimension which not significant value indicates that each generation tends to have similar preferences, while significant value shows that Generation X, Generation Y, and Generation Z have different housing attribute preferences on that dimension.

Based on the ANOVA result (Fig. 2) regarding the difference in *Space Comfort Dimension* (significance value of 0.0131), Generation Z prioritizes *space comfort* more than the other generations. The space comfort dimension includes *Wi-Fi availability, interior design, smart home, natural ventilation system, energy saving systems, natural lighting system,* and *exterior design*. This aligns with the statement by Stillman & Stillman (2017) that Generation Z likes practicality but is still cost-effective. It also indicates that Generation Z is more comfortable with technology and grew up with social media. It can be seen from the analysis results that the Wi-Fi availability variable and the smart home variable are in the same dimension as the energy saving variable. Regarding natural lighting and ventilation, this is in line with the study by Ekananda & Marcillia (2019), which explains that Generation Z prefers natural lighting and ventilation for their house. This is supported by Moghimi & Jusan (2015), where natural ventilation in the Asian context is still the main factor in housing preferences. In terms of exterior and interior design variables, Generation Z tends to pay attention to the architectural style of the residence. Findings from a study by Ekananda & Marcillia (2019) indicate that both Generation Y and Generation Z prefer a contemporary architectural style when choosing a house.
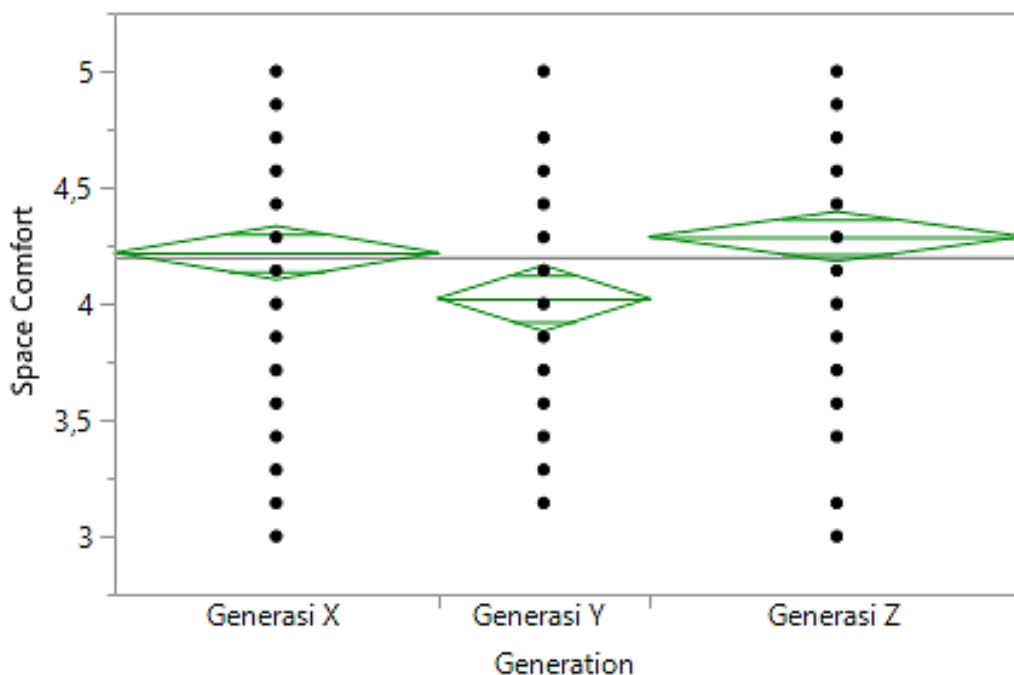

Fig. 2. ANOVA Result for Space Comfort Dimension (P= 0,0131)

Analysis of the *social interaction dimension* with a significant value of 0,0002 shows that Generation X prioritizes social interaction more than other generations (Fig. 3). *Social Interaction Dimension* included *gotong-royong*, *socializing with neighbors*, *religious environment*, *child-friendly environment*, and *community involvement*. This is similar to Ismail & Mohamed Shaari's (2020) statement relating housing preference to Generation X, which revealed that Generation X in Malaysia prefers environmental factors, including social relationships, in their housing preferences compared to housing type and location factors. Meanwhile, Generation Z and Generation Y prefer housing type rather than environment and location. In addition, Stillman & Stillman (2017) stated that Generation Z is more competitive and closed/individualist than previous generations. Generation Z is also trying to create their own identity. Ismail & Mohamed Shaari (2020) supported that statement, revealing that Generation X has a high sense of belonging and respect for the community in each residential environment, while Generation Y and Generation Z have physical factors more than their sense of attachment to the community. The analysis also indicates that Generation Z showed a tendency to be less interested in *social interaction* than previous generations.
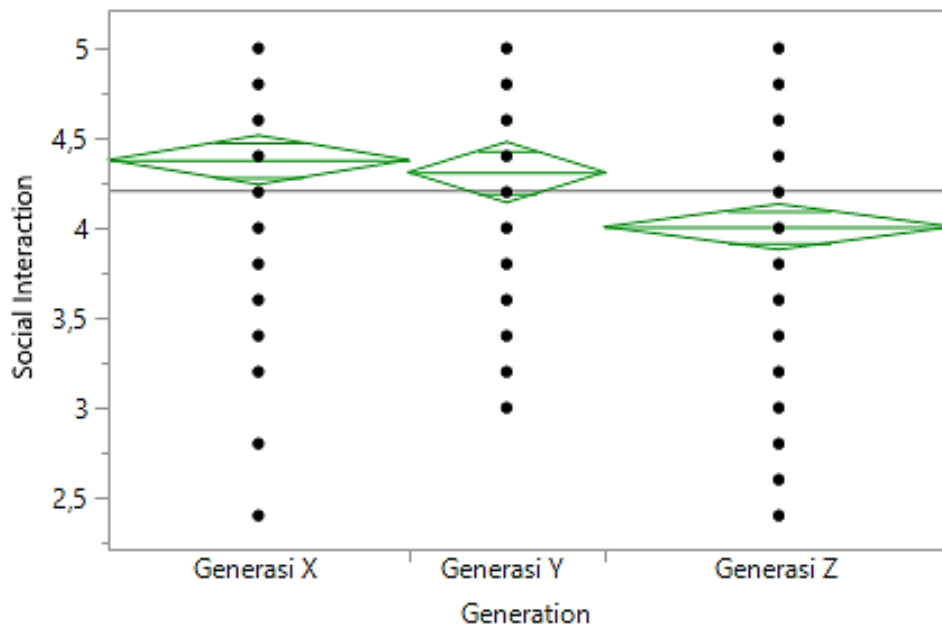
Fig. 3. ANOVA Result for Social Inteaction Dimension (P=0,0002)

CONCLUSIONS

The findings of this study reveal differences in housing attribute preferences between Generation X, Generation Y, and Generation Z. Based on housing type preferences, each generation has the same tendency to choose landed housing but with a different location. Generation X mostly chooses landed housing in the countryside, while Generation Z mostly landed housing in the suburbs. The analysis result of dwelling type preference can be used as a consideration for future planning and design for the types of housing and the selected target market. This study found 16 dimensions of housing attributes that influence housing preferences in Generation X, Generation Y, and Generation Z. Regarding the discussion on the dimensions of housing attribute that are most prioritized when choosing housing, all generation has somewhat similar views. Based on the results of PCA and factor analysis, three dimensions are most prioritized: *utilities* (mean 4,67), *infrastructure* (mean 4,61), and *environmental quality* (mean 4,58). Meanwhile, the three lowest scores are *housing finance* (mean 2,95), *artificial space comfort* (mean 2,45), and *housing tenure* (mean 2,17).

When looking at the differences in dimension between Generation X, Generation Y, and Generation Z using ANOVA, two significant housing attribute dimensions stand out: *space comfort* and *social interaction*. Between the three generations, the space comfort dimension is prioritized by Generation Z. This can be related to the background of Generation Z, which is still unemployed, grew up in the technological era, and prefers practicality but is still cost-effective. On the other hand, the social interaction dimension is mostly chosen by Generation X compared to the other two generations. This may be influenced by the attitudes of the older generation who are more respectful of interactions with the community and the younger generation who are more individualistic. From these two variables, it can be concluded that younger generations (Generation Y and Generation Z) consider the physical attributes of the house itself to be more important than a sense of community or environment. Meanwhile, the older generation (Generation X) considers the social Attributes more influential than the other attributes.

The findings of this study are significant in providing a better understanding and indicating to local authorities and housing developers the main dimensions of attraction in housing preferences favored by generations, which could be valuable for improving housing provisions in the future.

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