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Resilience in standardized housing estates: Housing monotony and adjustments

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Abstract: This study examines users' housing adjustments in standardized housing estates. It observed that housing adjustments in the estates are an expression of users' resilience and a response to the monotony of standardized housing. To gain insight into the users' resilience, the study developed a conceptual framework that highlighted housing adjustment and resilience indicators. The research method is qualitative, and it employs a schedule for in-depth interviews while the content analysis of the interview transcripts was achieved through the DocTool software. The study showed that residents of the estates are grouped into teams of expertise linked to their life cycle stages for the reconstructions required in their house adjustments. Moreover, community housing norms in the estates are developed from new layers of knowledge derived from housing adjustments and the reconstructions they involve. The study also linked residents' perceptions and gestalt to their resilience and housing adjustments. A significant achievement of the study is developing a conceptual framework for housing adjustment studies.

Keywords: *Housing adjustment, Housing norms, Monotony, Resilience, Standardized housing estate.*

1. Introduction

The global urban landscape has witnessed a surge in standardized housing estates, leading to a growing concern about its impact on the well-being of residents. These housing developments, characterized by repetitive and standardized design, have been criticized for their monotony, oppressive, and anti-democratic qualities, often failing to consider the needs and preferences of the individuals who inhabit them.

Standardization, with its emphasis on uniformity in housing estates, has created a sense of placelessness, with the built environment lacking vitality and individuality [1]. Repetitive design is also akin to monotony, repression, and blandness. Along this line, monotony in housing has been shown to induce resilience in the face of housing standardization as dwellings must accommodate multiple functions, from living and working to socializing and relaxing Prompayuk and Sahachaisaeree [2]. Nasrollahi [3] pointed out that resilience to standardized designs can be perpetuated by manipulating the visual aspects of its composition to achieve a desired level of gestalt vitality through housing adjustments. Primarily, this is because housing adjustments enhance improved functionality, overall livability, and personalization of spaces [4]. This, in turn, contributes to a stronger sense of ownership and well-being among residents [5]. Against this backdrop, this study uses a conceptual model designed by the authors to analyze users' housing adjustments as the outcome of their resilience in standardized housing estates.

1.1. The Concept of Resilience

Resilience has been described as the ability of a system to revert to normal operations after sudden changes in events without compromising core functions. A system can rebuild and reorganize itself after

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shocks to resist unwanted changes. Thereafter, Pike, et al. [6] redefined resilience as the ability to withstand shocks, adapt, survive, and improve despite unforeseen changes and stress, and rebound where and when necessary. Noting that these concepts are rather ambiguous, researchers have theorized resilience as either ecological or engineering with the former referring to a system's ability to find its way to a new state of equilibrium after shock and the latter, in contrast, is a system's ability to find its way back to its original state of equilibrium [7]. Building on this, Brand and Jax [8] propose two definitions, one referring to a system's capacity to return to pre-disturbance equilibrium, and another referring to a system's capacity to arrive at a new post-disturbance equilibrium.

Going further, the concept has been examined in its scope or extent. In this regard, Sharifi and Yamagata [9] cite that resilience can unfold at micro, meso, and macro levels. Following these, the authors cite examples such as building typology (micro), city size (meso), and transportation networks (macro) as entities that can be analyzed for resilience.

Within these contexts, resilience for this study refers to the ability of a housing system to respond to crisis (monotony) accruing as a result of housing standardization. Response in this respect is by housing adjustment which is the physical alteration or modification to the building to make the housing more suitable [1, 10]. Accordingly, the scale is 'micro' following Sharifi and Yamagata [9] definition of the scope of resilience.

1.2. Monotony in Standardized Residential Housing Estates

The design of government residential estates has been a subject of intense debate [1] with scholars arguing that it is underpinned by minimalist monotony which can perpetuate an alienating and often impersonal character. This view is rooted in the notion that the focus of such design is to achieve a pre-determined building form, rather than caring for the needs and preferences of users. It was also noted that this leads to a situation where the value of a building in use is often at odds with its value as a form [11]. This design approach, it is argued, has generated conflicts between people and the built form and has led to the loss of place-identity [12]. Worried by these developments, Kiessel, et al. [13] observed that this disposition largely omitted the importance of personalized approaches thereby underestimating the subjective problems associated with human experiences and the built environment. Isah [14] further explained that the approach can lead to a sense of placelessness, loss of identity, and alienation which is a far cry from democratic goals that involve the creation of environments that cater to the diverse and multifaceted nature of human experience.

Buttressing their views, Al-Mohannadi, et al. [15] pointed out that housing estates are often characterized by monotony and a detachment from the nuanced socio-cultural needs of residents while prioritizing standardized and mass-production methods. Kardash [16] and Luciani and Curto [17] further elaborating, noted that the assumption of "uniformity" underlying standardized residential estates fails to acknowledge the varied needs and desires of different segments of the population while Carrà [18] explained that the understanding of what people truly want from their environments goes beyond the treatment of buildings as platitudes that fail to transcend the monotony of their socio-spatial settings.

1.3. Existing Model

In addressing users' resilience in standardized housing estates, this study seeks to develop a conceptual model. On this note, it adopted and built on the position of Vieira [19] that it is possible to demonstrate the resilience of a system by observing its reaction under a monotonous situation, in a socio-spatial setting where at least the following parameters - permanence, environment, and autonomy – interact freely. Accordingly, permanence is understood as the willingness of the users (family or household) to stay in the dwelling. "Environment" is thought of as the social fabric surrounding the housing unit and autonomy pertains to a user's capacity to transform or adjust the house. In addition, Vieira included the concept of "learning" in the model to indicate that as households or families in the community adjust their buildings by themselves, they learn through the reconstruction process and will

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be able to share their knowledge with other members of the community owing to social bonds that were established along the process. This opens possibilities to collectively adjust their houses, utilizing the approaches that were developed during the process. Osman, et al. [20] observed that such approaches may even consider the development and use of more efficient and cost-effective alternative technologies including bamboo-reinforced technologies, sandbags, or adobe constructions. Finally, in this socio-spatial setting, there is also a possibility of self-organization arising from the social bonds that have been established, as shown in Figure 1 (model 1).

Figure 1.
Social bond and self-development.

3. The Study Area, Gestalt and Model Development

The study was carried out at Igba, a standardized housing estate in Ondo Nigeria (Figure 2) having the parameters stated by Vieira. Indeed, the justification for adapting Vieira's model comes from its strength in addressing similar situations in the study area with the stated parameters of environment, permanence, and autonomy. The housing estates are owner-occupied and as a result, users have the autonomy to freely adjust their houses. Secondly, because, the houses are owner-occupied, the willingness to dwell there is self-evident highlighting permanence. Thirdly, the houses are mass-produced, standardized, and identical resulting in the monotonous environment described by Vieira.

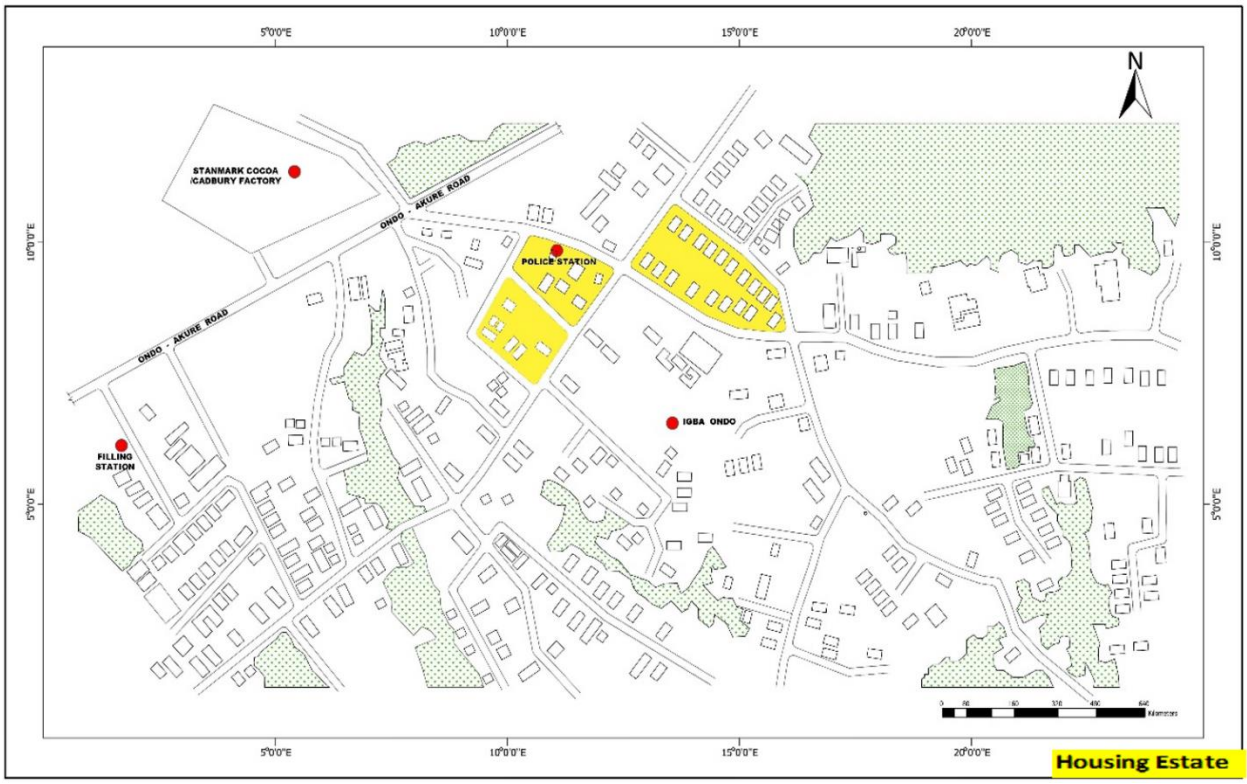

Figure 2.
Map showing the location of the housing estate.

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The estate was part of a nationwide housing intervention in Nigeria. However, it was too far from workplaces and did not conform to the workers' expectations making it unattractive. With declining economic situations, the estate soon became attractive bringing in families and households whose primary concern was to re-design the houses to fit their aspirations resulting in the adjustments of the houses. Each of the housing units in the estate was either semi-detached 1-, 2- or 3-bedroom bungalows arranged in closely spaced grids. The estate offers a distinctive opportunity for this study as the adjustment efforts were handled collectively within the community. Artisans and foremen who keyed into the government scheme and bought units of houses, volunteered along with other community groups to assist in the collective reconstruction as part of survival strategies in the declining economy. In this way, community members went through a learning process and the study area provided the environment for autonomy and permanence required for the research (Figure 3). Tipple [21] observed that this form of community assistive network has found a commonplace in developing countries.

Finally, because users aim at achieving a desired visual composition by manipulating the spatial components of buildings and re-arranging its elements, such as windows and doors to achieve a desired level of vitality and resilience, the gestalt of buildings becomes relevant to adjustments studies [3]. Given this, gestalts are included in the proposed model as a resilience indicator along with self-organization as indicated in Figure 3 below (model 2).

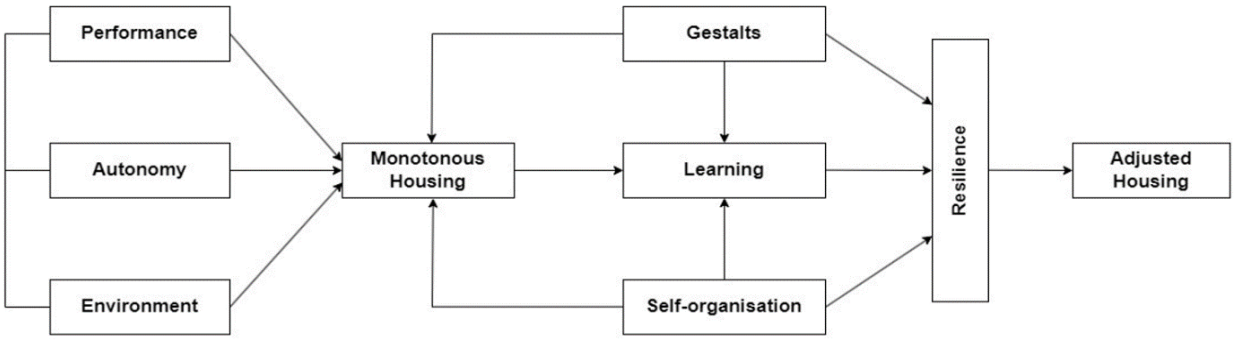

Figure 3.
Resilience indicators in the existing model.

3.1. Gestalts

Gestalt is a concept that emphasizes the holistic nature of perception and has provided a framework for understanding how individuals perceive and organize the visual information they encounter in the built environment. Stimulus gathered from the built environment are structured in the user's mind to gain meanings in a particular order [22]. In this way, Gestalt psychologists have arranged this order into gestalt patterns so much so, that the environment cannot be perceived without meaning.

Gestalt principles emphasize the importance of objects being placed in a way that they create a sense of balance and order. This gestalt approach is often employed in housing that is intended (can be through adjustments) to convey a sense of grandeur, monumentality, and visual harmony [23, 24].

3.2. Gestalts and Housing Adjustments

The adjustment of buildings is the endeavour to achieve a composition in which the relationship between the individual components of the house and the overall composition plays a crucial role in re-shaping the user's experience. Gestalt theory offers a unique lens to examine this.

By selectively enhancing, weakening, or altering the visual relationships between the various components of housing through adjustments, gestalt patterns, as well as the user's perception and experience of the built environment are re-shaped. Needless to say, gestalts can be employed as a means of moving beyond the stereotypical attributes often associated with housing estates [24, 25].

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Accordingly, gestalt's relationship with housing adjustments raises an intriguing question: how does users' resilience to the monotony impact gestalt in the estates? [26]. This study addresses this gap alongside a framework that enables it to address other interplays impacting adjustments in standardized housing estates.

3.3. The Concept of Housing Adjustment: The Conceptual Framework

Studies on housing adjustments have utilized different theoretical perspectives to examine the phenomenon, including the Actual-Aspirational Gap Theory, Morris and Winter's concept, and Maran and Rodger's concept [27, 28]. The Actual-Aspirational Gap theory posits that housing adjustments are measured by the gap between individuals' actual and desired housing based on their housing needs. The Morris and Winters's concept, on the one hand, posits that such housing need is evaluated by family housing norms, which are influenced by the household's life cycle stages [14, 29, 30]. Maran and Rodger on the other, posit that housing need is dependent on the users' perception of their housing, and that perception is shaped by users' characteristics [29]. Consequently, these theoretical approaches highlight the importance of considering the following factors as housing adjustment indicators: user characteristics, perception, life cycle stages, and housing norms. Housing norms are the communal housing style adopted by families after adjustments, hence it is interchangeably used as community norms. In this way, this study builds on model 2 (Figure 3) above by including the housing adjustment indicators to arrive at model 3 (Figure 4). This is the model adopted for this study.

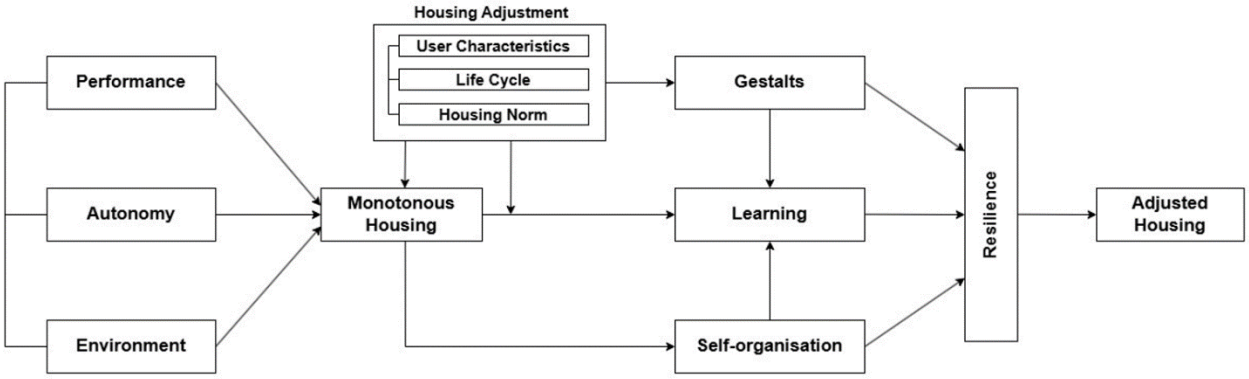

Figure 4.
Conceptual framework.

4. Materials and Methods

The study employed a qualitative research method and conducted in-depth interviews through interview guides on residents of the Igba estate. The estate met the conditions for autonomy and permanence required for the research. The interview was administered to heads of households, who were the primary decision-makers regarding the adjustments to their housing and have lived long enough in the estate to have experienced life cycle stages. 13 respondents were selected purposively because they are information-rich and have extensive experience in the housing estates. According to Guest, et al. [31] a minimum of 12 participants is the required sample size for the qualitative phase. The interviews were recorded, and transcribed, and the contents were analyzed. Themes were extracted using the DocTool software, a Microsoft Word Add-in for content analysis in qualitative research [1, 32]. The themes were then quantified by ranking them ordinally and in percentages according to their frequency of occurrence in the content analysis.

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5. Analysis

Exploratory Factor Analysis (EFA) of model 3 was conducted using the Statistical Package for Social Sciences (SPSS) version 30 following the quantifying of the themes that emerged from the content analysis of the interview into ordinal data (Table 1).

EFA was by Principal Component Analysis with Direct Oblimin rotation method. The result showed Kaiser- Meyer-Olkin measure of sampling adequacy of 0.6 (Table 1) which is recommended [33].

Table 1.
Kaiser-Meyer measure of sampling adequacy and Bartlett Test.

Kaiser-Meyer Measure (KMO) of sampling adequacy	0.602
Bartlett test of sphericity (significance)	0.002

Cronbach alpha test of reliability and the internal validity of the variables for the resilience and housing adjustments indicators are 0.6 and 0.8 respectively (Table 2). According to Pallant [34] Cronbach's alpha between 0.6 and 0.8 is acceptable showing that the indicators have good internal consistency.

Table 2.
Cronbach alpha test of reliability and the internal validity.

Resilience indicators			**Housing adjustments indicators**		
Cronbach alpha	Number of items	value	Cronbach alpha	Number of items	value
	3	0.799		4	0.634

According to the EFA, a total of seven components were extracted. This is shown in the scree plot highlighting the eigenvalues and the component numbers (Figure 5).

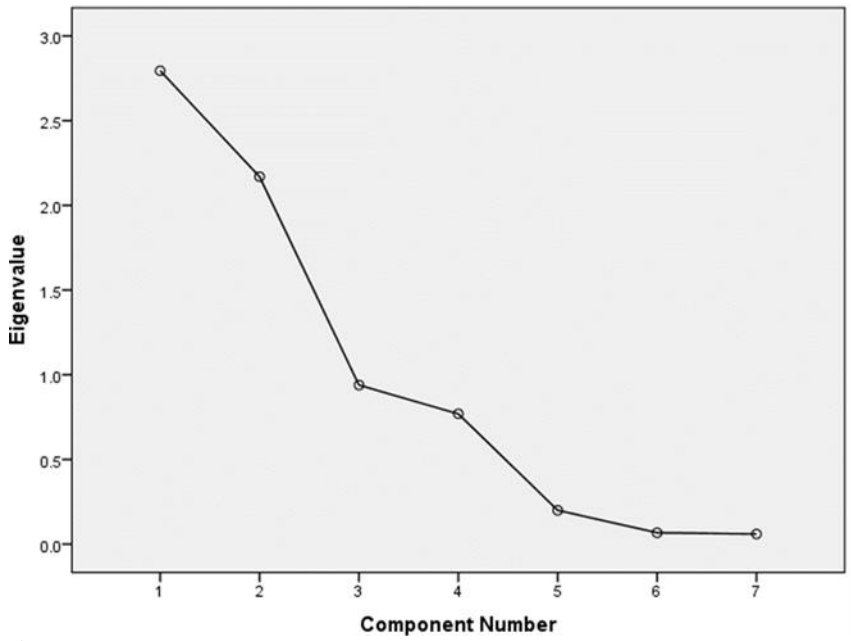

Figure 5.
Eigenvalues and components extracted.

Components 1 and 2 explained 70.92% of the total variance within the data sets. Accordingly, EFA extracted the components into two groups (Table 3) each comprising the resilience (self-organization,

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Gestalts, and Learning) and housing adjustments indicators (User characteristics, Perception, Housing norms, and Life cycle). The two groups explained 70.92% of the total variance within the data sets.

Table 3.
Pattern matrix – Resilience and housing adjustments indicators.

Indicators	Components	
	1	2
Self-organization	0.955	
Gestalts	0.829	
Learning	0.807	
User characteristics		0.866
Perception	0.575	0.733
Housing norms		0.64
Life cycle		0.525

6. Discussion

This study discusses users' resilience to the monotony of standardized housing estates by housing adjustments.

The data analysis presented in Figures 6 – 10 offers insights into the housing adjustments and resilience dynamics in the estates.

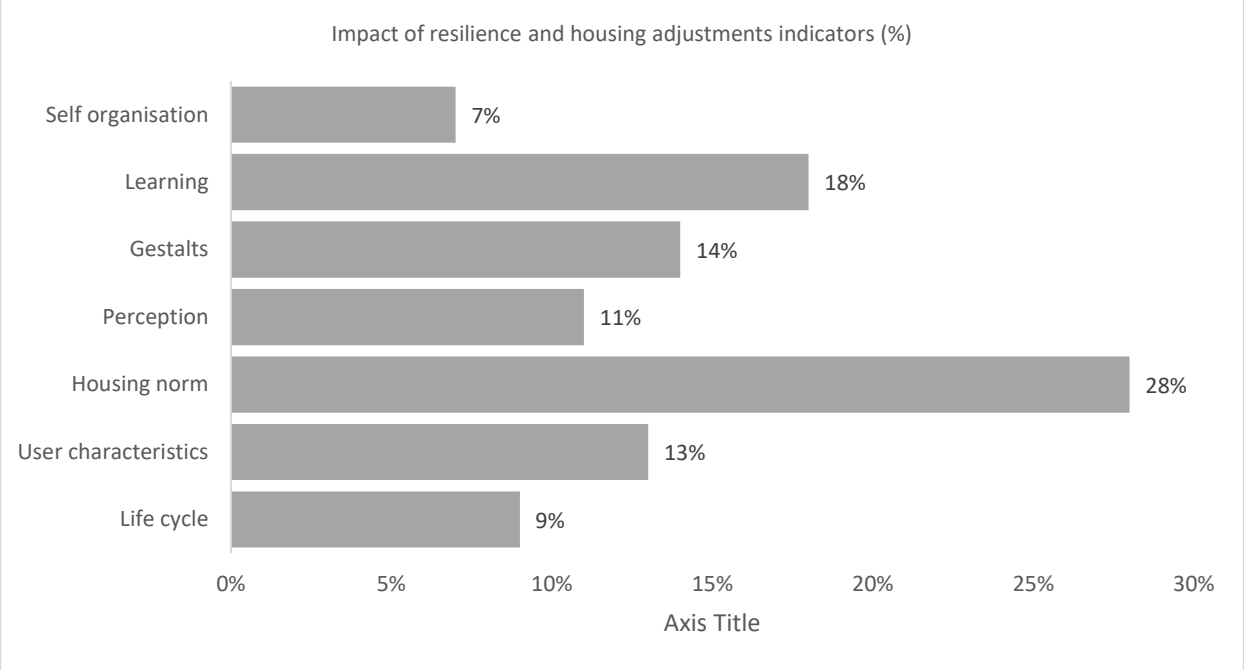

Figure 6.
Impacts of housing adjustments and resilience indicators.

Figure 6 shows that the impact of the housing norms, a housing adjustment indicator, is the highest in estate. Accordingly, gestalt, learning, and self-organization which are resilience indicators are in ratios: 14%, 18%, and 7% respectively. These places housing norms as the highest indicator in the estates and suggest that shared norms in the community play a crucial role in shaping the residents' ability to adapt and thrive in the face of monotony.

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Perception, a housing adjustment indicator, also emerges as a key influence on resilience. Noteworthy is its impact on gestalt. Perception, of all the housing adjustment indicators, has the highest impact on gestalt. Taking into consideration the ordinal rankings of the data, a Spearman rank correlation of perception and gestalt is significant ($rs = 0.61$; $p = 0.035$) whereas the Spearman correlation of life cycle stages, user characteristics, and housing norms are not. This highlights the importance of residents' perceptions to their resilience.

Going further, the study showed that the correlation between learning, a resilience indicator, and housing norms is significant ($rs = 0.654$; $p = 0.021$) but not significant with user characteristics, life cycle stages, and perception which are other housing adjustment indicators. Correspondingly, what is learned in the estate during the housing adjustments and reconstructions is based on their housing norms. This is further supported in the ogive (Figure 7) between learning and housing norms which highlights a positive correlational relationship.

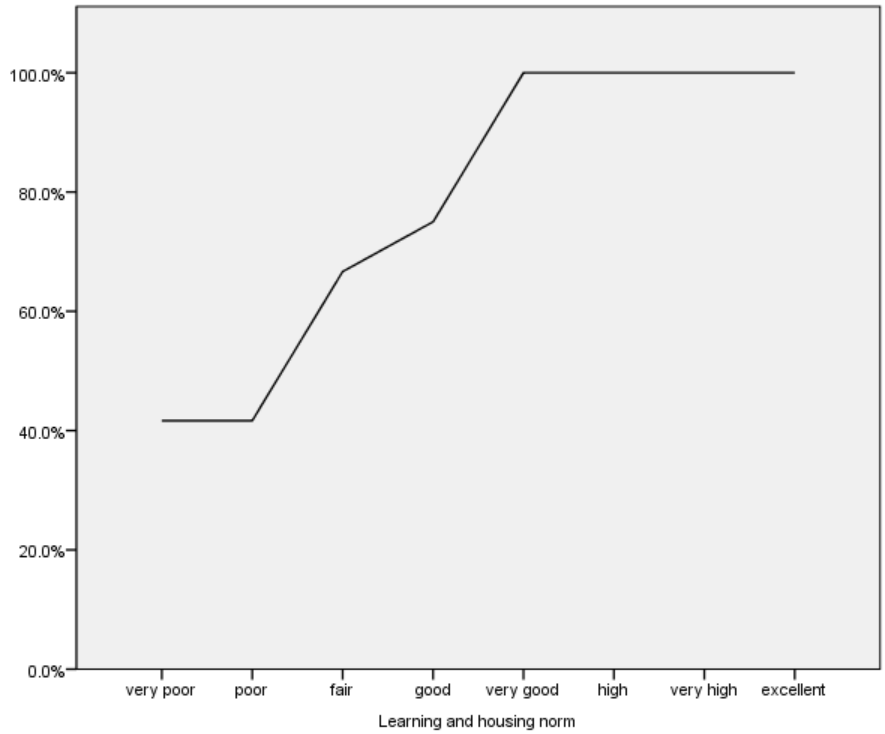

Figure 7.
Ogive diagram of the relationship between learning and housing norms.

However, because the learning experience is collective, it also helps to improve community-based knowledge leading to the development of new layers of housing norms. The new layers offer fresh solutions to reconstruction techniques during housing adjustments. This process reverts repeatedly as shown in Figure 8, to build layers of community housing norms.

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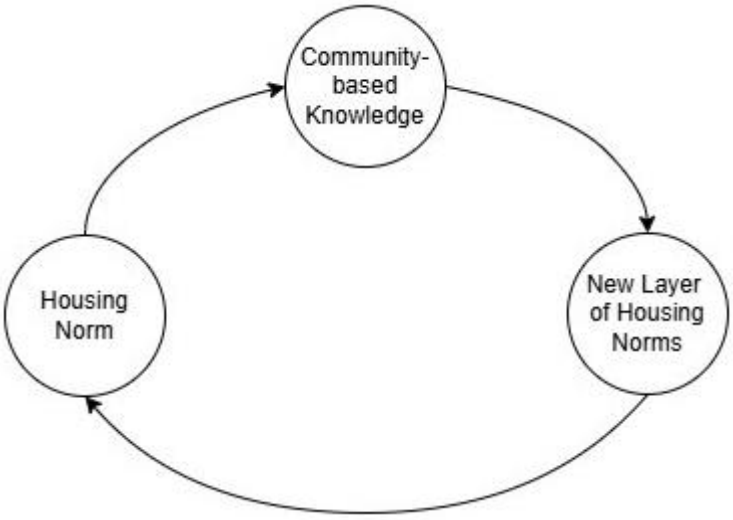

Figure 8.
Iterative development of housing norms.

In addition, Vieira also noted that there is a possibility of self-organization in the estate due to the social bonds (Figure 1). Hence, it can be inferred that as fresh solutions develop through learning, the reconstruction process becomes self-organized resulting in specialization and expertise (Figure 9). From this process, self-organization emerges as community members disaggregate into groups of specialization where they have acquired masteries through learning.

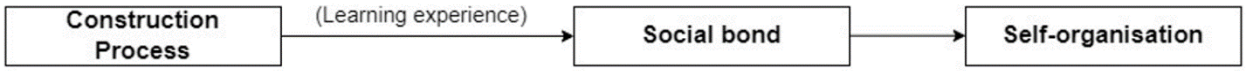

Figure 9.
Learning experience and self-organization.

To further explore these dynamics, the analysis investigated the relationship between housing adjustment indicators and self-organization. This shows a significant correlation between self-organization and life cycle stages ($rs = 0.6$; $p < 0.05$). Association with other adjustment indicators is not significant. This can be explained when viewed against a backdrop of the estate's population. According to the participants' testimonies in the interview, the population in the estates is separated by age disaggregation and life cycle stages. Since family sizes and associated housing need burgeon as the family units advance and grow, the necessity for housing adjustments also heightens. Correspondingly, this development enhances the possibility of learning and results in expertise and self-organization.

Hence, those who have lived in the estates for a longer time and have experienced life cycle stages are more likely to be self-organized into groups according to their mastery of community-based construction knowledge. Moreover, from Figure 8, they are also likely to have stronger social bonds than those who have not experienced life cycle stages.

From these insights, the study shows that resilience in standardized housing estates enhances the development of housing norms. The study also shows that housing norms are the basis for the learning experience and that this experience further results in the development of new layers of community norms in the estates. This process becomes iterative creating a loop (Figure 8). The study further shows community norms are central to housing adjustments and resilience. This is because community norms underpinning residents' learning experiences as earlier stated, enhance the learning process to improve social bonds and culminate to self -organization. Despite this, the study notes that individuals' housing perception impacts gestalt to re-create visual vitality in the adjusted houses. Therefore, regardless of the

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community norms, residents' perception impacts gestalt and visual composition creating uniqueness in individual houses. Aside from these, the study highlighted that residents of the estate acquire expertise in community-based construction knowledge and improved social bonds as they experience life cycle stages. These inferences are shown graphically in Figure 10.

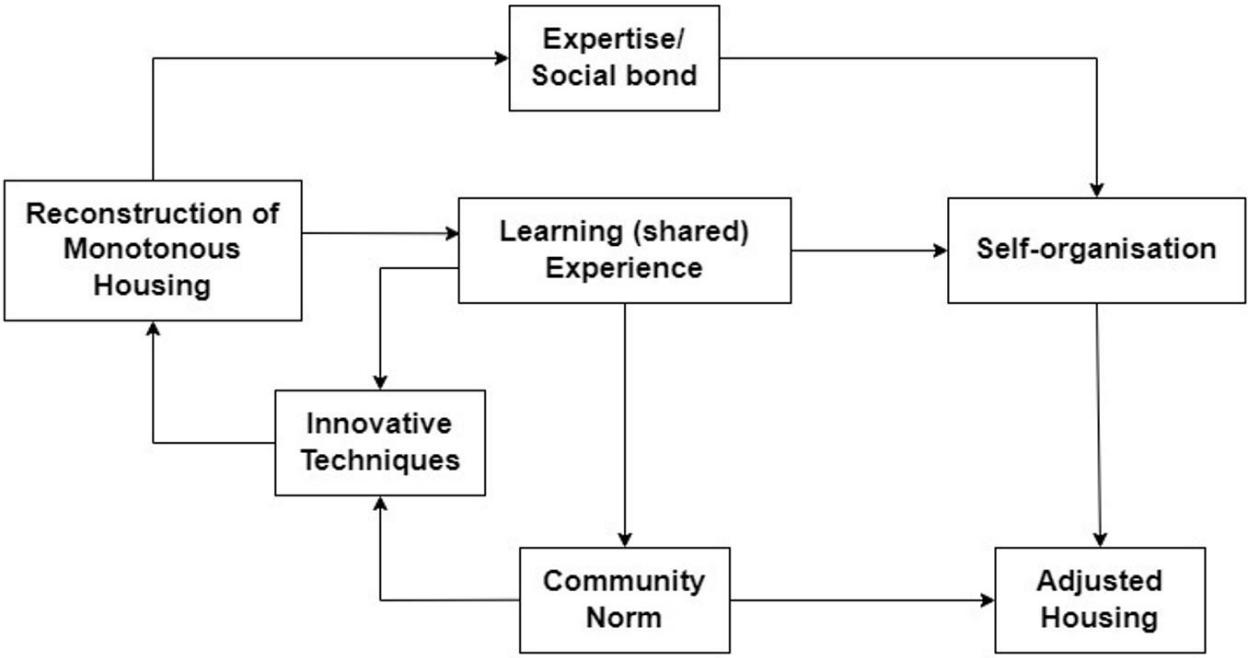

Figure 10.
Graphical analyses of study inferences.

7. Conclusion

Previous studies have shown that in a monotonous housing environment where users have autonomy and permanence, resilience to the monotony will occur. This study built on this to highlight that resilience is expressed by housing adjustments and spotlighted its indicators as gestalts, learning, and self-organization. Following the development of the model that examined resilience and housing adjustments, the study further shows that the housing adjustment processes lead to community norms within the estates and that community residents learn from the norms and organize themselves into groups depending on their expertise. The learning process enhances self-organization which is strengthened by families' life cycle stages in the estates. Despite these, the individual perceptions and their gestalt led to the uniqueness of their houses within the estate. A conceptual model is advanced for the analyses.

Note: This is a case study that was conducted as part of the first author's Doctorate Research

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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