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Designing Youth Housing Through Configurational Theories: Space Efficiency and Community Integration for Young People

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ABSTRACT
Youth housing is an increasingly relevant socio-spatial issue, which was triggered by economic insecurities, change of life stages, and changing household structures. The rise of housing prices and the intensified residential mobility has led to the spread of co-housing and co-living conditions hence creating sensitive questions relating to spatial efficiency and incorporation of community life. This paper explores the role of configurational design in relieving such problems in the area of youth housing.

The approach is theoretical and qualitative, combining the configurational analysis based on configurational theories with comparative research, and a sequence of international cases. This triangulation enables a subtle interpretation of the hyper-variable factors controlling housing efficacy among the younger cohorts.

The study dampens on two opposite typologies, Wohnprojekt Wien in Vienna and Share house LT in Osai Tokyo, and studies them at building and unit level. Spatial organisation, circulatory patterns, and gradient of privacy as well as spatial distribution of common amenities are analytically stressed.

The existing body of empirical evidence shows that space efficacy is dominated by the relational spatial logic concepts as opposed to the sheer scale of individual items, but community level of integration depends on the configurational location of communal space within the existing movement networks. The mixed results of the cases are indicative of the importance of contextual specificity when implementing configurational strategies.

The paper therefore shows the analytical quality of the configurational theories in explaining and designing responsive youth housing environment that are efficient and supportive to the community integration.

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I. INTRODUCTION

In architectural and housing literature, housing with the young people has become a complicated and multidimensional issue, which is influenced by economic, social, and spatial factors (Fieldhouse and Worpole, 2000; Bredenoord, van Lindert and Smets, 2014). In contrast to traditional housing paradigms, youth housing is supposed to adapt to the shifting life conditions, reduced living times, and varying household set-ups, thus making specific demands on spatial organisation and flexibility (Schneider and Till, 2007).

One of the key issues that can influence the housing situation of the youth population is that they are likely to be faced with economic pressures such as unstable career advancement, late entry into the secure income streams, increased housing prices, and lack of affordability in the urban housing markets (Clapham, 2005; Heath, 2008; Forrest and Yip, 2012). This situation has led to an increase in the use of rental housing and co-living arrangements, which are often defined by temporary occupancy and lack of control over the living conditions (Ronald & Elsinga, 2012). It has been shown that such economic limitations do not only affect housing access but also residential stability and the capacity to form long-term connexions with place (Kleinhans and Kearns, 2013).

Youth housing has also been closely associated with transitional time in life, which is characterised by changing between education, employment and living independently (Heath, 2008). At this stage, families tend to be mobile, characterised by the frequent movement, change in the patterns of cohabitation, and change in

household needs (Van der Horst and Ouwehand, 2012). Conventional housing models, which are usually created to house long term and stable household structures have been criticised because of their low adaptability to such variability (Schneider and Till, 2007).

Meanwhile, more general shifts in social trends have changed the way domestic space is utilised and distributed. Extended family living has faded, household types have become more varied and single-person households and shared households have emerged redefining expectations of privacy, collectivity and domestic routines (Lawrence, 1987; Forrest and Yip, 2012). Reactions to other forms of housing have also developed, including co-housing and co-living, where shared space and common amenities are prioritised but also where the spatial organisation, conflict management, and social sustainability are also questioned (Vestbro, 2000; Ronald and Elsinga, 2012).

II. THEORETICAL FRAMEWORK

This research is based on an interdisciplinary theoretical framework that integrates architectural theory, housing studies, and spatial analysis in order to examine youth housing as a spatial, social, and configurational phenomenon. The framework is majorly based on theories of dwelling and place, flexible housing, and configurational theories of place, and sustainability thus placing spatial configuration as an intervening variable between economic limitation, social patterns, and architectural form.

2.1. Home, Dwelling, and Habiting

The term home is believed to be a multidimensional construct and it is defined to include physical, social, emotional, as well as symbolic aspects. According to phenomenological interpretations, it is important in the formulation of identity, belonging, and meaning, therefore, describing dwelling as experiential connexion between individuals and space (Norberg-, Schulz, 1979). More recent analyses of housing, though, have argued that the definition of home is not pre-determined but constructed based on social context, tenure circumstances, and experience, in certain situations of housing precarity and mobility (Mallett, 2004; Blunt and Dowling, 2006). In this context, dwelling, a culturally expressed, emotionally located relationship with space is opposed to habiting, a more practical, short-term form of occupation characterised by minimal attachment, and power as well (Hillier and Hanson, 1984; Heath, 2008). This difference is particularly relevant to the youth housing where transitional living period, temporary tenancies, and financial insecurity habitually define the residential life.

2.2. A Modular House and Adaptability

A second pillar of the framework is the theoretical approach of flexible housing. Flexibility is perceived as the ability of housing to adapt to change with an over time change in the number of people in the house, their patterns of use and the socio-economic factors (Schneider and Till, 2007). Flexible housing is viewed instead of housing as a product, but one that can be spatially adjusted, involve user involvement and have long-term flexibility (Tipple, 2000). Theories behind flexibility are based on historical and current examples, such as vernacular architecture, open building movement (Habraken, 1972) and experiments in modular and prefabricated housing after modernism and in the post-war period. The strategies focus on the distinction of structural systems and flexible infill, which enables people to personalise and customise the environments where they live. As a result, flexibility is seen not only as a technical approach but as a spatial state that cuts across the social organisation and ordinary practises (Hanson, 1998).

2.3. Theories of Space, Configurational

The main analytical element of a framework is comprised of configurational theories. Using the theory of Space Syntax, space is theorised as a relational system whereby space and relational arrangement of the spatial elements determine movement, visibility, accessibility and social interaction (Hillier and Hanson, 1984; Hillier, 1996). The main concepts of integration, connectivity, depth and spatial hierarchy offer analytic means to the evaluation of ways architectural layouts organise patterns of co-presence and separation. Spatial configuration in this paradigm is not an item of thought, but of action that mediates between personal and community living. Previous studies indicate that the balance of privacy and interaction depends on configurational properties especially in high density and shared housing (Hanson, 1998). The phenomenological approaches to space fill this viewpoint by paying attention to the emotional and experiential aspects of space, that is, atmosphere, thresholds, spatial sequencing (Norberg-Schulz, 1980; Pallasmaa, 2005). A combination of the above-mentioned methods allows building an idea of how spatial form influences the behaviour and perception. Typological theory also contributes to configurational analysis by identifying repetitive housing forms and social logics embedded within those housing forms. Historically tried space arrangements like the courtyard housing, cluster units, and shared circulation models are perceived as being redesigned to suit current housing requirements (Hanson, 1998; Alexander et al., 1977).

2.4. Youth Housing as a Socio-Spatial Situation

The problem of youth housing is handled as a specific social-spatial state of economical precarity, phase of transitions in life, and changing social trends (Clapham, 2005; Heath, 2008). The framework acknowledges that the living conditions of the young people are undergoing instability of incomes, restricted access to ownership, and enhanced mobility, which often lead to short-lived and accompanied displays (Forrest and Yip, 2012; Ronald and Elsinga, 2012). In this regard, spatial planning is considered as one of the processes according to which housing may support individual freedom and shared life. Shared spaces, semi-public space, and privacy gradient are seen not as an isolated programmatic element but in terms of their configurational location and their accessed-ability (Van der Horst and Ouwehand, 2012).

2.5. Configurational Resilience and Sustainability

Sustainability is also made as a part of environment and the social aspect of the housing performance. Sustainable housing is also conceived in regards to adaptability, durability, and social cohesion, as well as in terms of energy efficiency and resource optimisation (Vale & Campanella, 2005; Guy and Farmer, 2001). Configurational dimension defines sustainability to be associated with spatial configurations that facilitate shared resources, diminish redundancy, and attain long term flexibility. They discuss communal facilities, compact designs, and flexible organisation as ways of bridging environmental performance and social sustainability, especially in the youth housing context which is defined with scarcity of resources and changing needs (Schneider and Till, 2007; Vestbro, 2010).

III. SPACE EFFICIENCY

Space efficiency is a central defining factor in youth residential units, due to the current economic limitations, unit size, as well as the growing mode of co-residing. In the prism of the configurational theory, the notion of efficiency is not theoretically reduced to the concepts of spatial diminution, but to the rationality of making spatial relations to support a variety of uses, flexibility, and socialisation (Hillier, 1996; Schneider and Till, 2007).

Other important measures of space efficiency are the net-to-gross ratio (space, the ratio of the usable living space to constructed area). This is a common ratio that is boosted in youth housing scenarios by the application of small services core, common infrastructure and elimination of redundant circulation areas (Habraken, 1972). However, not all circulation is inefficient as it can be used together with communal or multifunctional space in enhancing spatial and social performance (Hillier and Hanson, 1984).

Efficient housing planning incorporates multifunctional spaces where single spaces are allowed to change in usage as time goes by. The has weakened spatial redundancy by providing shared kitchens, lounges, and workspaces to accommodate the active lifestyles of younger populations. Expediency and flexibility, brought about by the ability to create flexible designs and portable features, expounds on efficacy by allowing spaces to transform with the changing needs of users overtime (Schneider and Till, 2007).

The spatial configuration has a strong impact on the effective use of space. Setups with greater levels of spatial blending are more likely to accommodate a more intense use, and defined patterns of movement and thus enhance the functionality of shared space without increasing the floor space (Hillier, 1996). Planning tools like plan studies, adjacency analyses, and the visibility analyses must, however, be counted to be essential in considering spatial performance and optimising layouts in initial stages of design.

IV. COMMUNITY INTEGRATION

The issue of community integration can be understood as the topical issue of youth housing, especially considering the current transitional nature of the lives of its residents, and the corresponding risk of social isolation that arises due to the lack of a stable residence (Van der Horst and Ouwehand, 2012).

Distributed spaces - such as common kitchens, lounges, terraces and courtyards - serve as means through which informal social exchange occurs. They depend upon their spatial arrangement in the entire composition to be effective or not. Being placed in key movement directions or in space nodes, these spaces inherently provide co-presence and informal interactions (Hillier, 1996; Whyte, 1980).

Progression of privacy is very relevant in the optimization of collective and personal requirements. Staged public-to-private spaces, at entrances, semi-public common areas, and private rooms, provide residents with different levels of social exposure and control, and are thus consistent with the notion of intimacy gradients introduced by Alexander (Alexander et al., 1977).

Graphical relationships are able to boost social consciousness without any interaction requirement. Openness of circulation and communal space and framed views over common spaces, help ease informal social interaction and develop a sense of belonging (Hanson, 1998). Also using phenomenological visions, the role of atmosphere, light, and materiality is emphasised to create a sense of emotion comfort and spatial attachment, reducing the institutional quality that may be largely related to collective housing (Norberg-Schulz, 1980; Pallasmaa, 2005).

On the city level, the interaction between housing and the city defines the community integration. Nearby accessibility, active floor street accessibility, and combined civilian services helps bridge the youth housing centres to daily life urbanity and facilitate integration of the youth into the wider urban community other than the building (Gehl, 2010). The design approach that incorporates residential, social, and productive spaces is indicative of the modern living trends and also builds up on spatial, as well as social, sustainability (Schneider and Till, 2007).

V. METODOLOGY

This study employs a qualitative, theory-based methodology to examine the relationship between spatial configuration, space efficiency, and community integration in youth housing. The research combines configurational analysis, case study analysis, and comparative analysis.

5.1. Research Methods

The configurational analysis is based on such central concepts as integration, connectivity, depth, and co-presence, which are used to assess the influence of spatial configurations on movement patterns, accessibility, and the degree of possible social interaction. The proposed analytical framework is based on the reading of the plan and the hierarchies of circulation and the positioning of shared and private functions spatially.

The case-study analysis explores constructed youth and co-living housings projects concerning both building and the unit aspects focusing on spatial organisation, circulation, privacy gradient and communal space allocation. This type of approach allows testing theoretical principles in real architectural situations.

The exercise relies on comparative analysis to detect convergence and divergence between the chosen cases which in turn can support cross-case analysis of the configurational strategies without favouring one spatial model.

5.2. Case Study Selection Criteria

The following criteria were used to select case studies, namely: relevant to youth or co-living housing, shared spaces, proven spatial efficiency, international, and presence of architectural documentation. The two projects chosen (Wohnprojekt Wien (Vienna) and Share House LT Josai (Tokyo) are opposing but similar to the differing ways of configurational design in youth housing.

VI. CASE STUDIES

Two international cases, Wohnprojekt Wien, Vienna, Austria, and Share House LT Josai, Tokyo, Japan, will be used to apply the configurational theories to youth and co-living housing. Even though these two projects are set against very different cultural and urban backgrounds, they both face issues of lack of space, cohabiting, and integration through different spatial solutions.

6.1. Wohnprojekt Wien, Vienna

Wohnprojekt Wien is a participative housing project that has been prepared using a participatory design process. The five-storey building aids forty residential units and in excess of 1,000 m^2 and above of common area spread out in all the storeys. The design will include shared kitchens, workshop spaces, and social spaces on its regular streets rather than isolating communal services. The transitional areas are made up of wide stairwells, access galleries and courtyards, which increase the spatial permeability, and ease the common co-presence (Hillier and Hanson, 1984) (Figure 1).

A distinct gradation of privacy, i.e. between urban public space and semi-privacy in galleries to private units, achieves community integration (Figure 2). The site occupancy of the location of building area in Nordbahnhof regeneration area in Vienna, which lies in close proximity with the public transport and mixed-use facilities, strengthens its urban connectivity. These flexible unit layouts, minimised internal circulation and shared infrastructure are sources of spatial efficiency. The unit, which was studied (74 m2), shows flexibility due to the application of the non-loading partitions and open-plan living core (Figure 3).

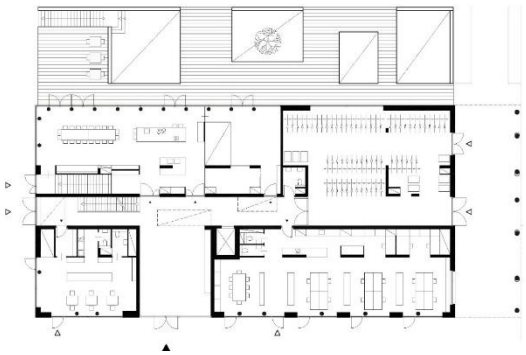

Figure 1

Figure 2

Figure 3

6.2. Share House LT Josai, Tokyo

The Share House LT Josai, which is an example of a community-style live-together house, is located in the heart of Tokyo. The structure is structured around a small internal courtyard that injects daylight and ventilation into an internal loop of a corridor, making the structure efficient in its circulation despite a high density of footprint (Figure 4). Vertical distribution of all communal facilities such as a large common kitchen, co-working lounge and rooftop terrace help distinguish between active and quiet functions (Figure 5).

The concept of community integration here is all based on proximity and not intensity. The isolation of private rooms encourages co-presence with non-disruptive high-traffic places and allows the co-presence between patient and caregiver in a non-coercive setting (Hillier, 1996). Spatial efficiency in the 13-m2 size of the unit considered in the research article can be demonstrated by multifunctional furniture, vertical storage cycles and minimum circulation patterns. Communal facilities offset the smaller internal space thus allowing effective use at the building level.

Figure 4

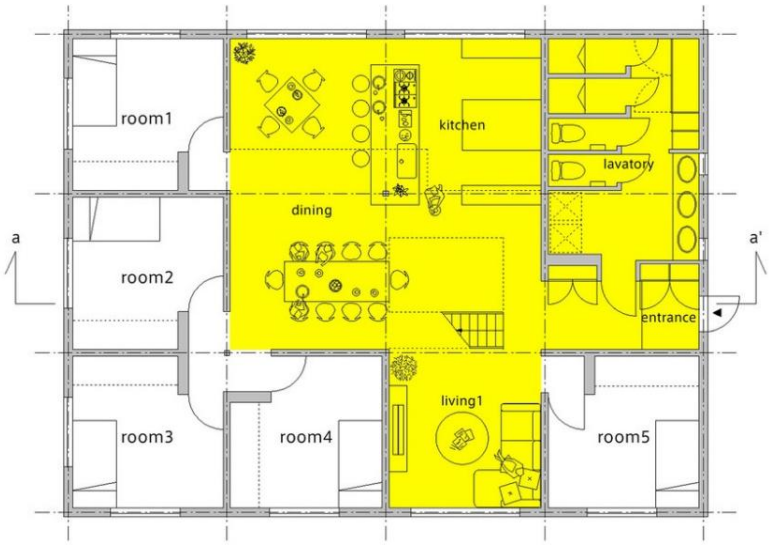

Figure 5: Ground floorplan

Aspect	Wohnprojekt Wien	Share House LT Josai
Housing model	Cooperative co-housing	Urban co-living
Spatial strategy	Integrated shared spaces	Vertically layered shared spaces
Unit scale	Medium-sized family units	Micro-living private rooms
Community logic	High interaction through circulation	Controlled interaction through buffering
Space efficiency	Flexibility and shared infrastructure	Compact units and multifunctionality

Table 1: Comparative analysis between two case studies

VII. DISCUSSION

The study resolves the interdependence between the theoretical constructs of dwelling, flexibility and configurational space and empirical observations based on two youth housing case studies in the international context. The discussion shows that spatial architecture serves as a mediating process between economical restrictions, community customs and architecture.

A powerful approach to explaining the relationship between spatial patterns of movement, co-presence, and social interaction is found with configurational theories, in particular Space syntax. The distribution of the common areas in the integrated circulation networks in both case studies promotes informal confrontations without imposing social interaction. Wohnprojekt Wien opts to do this by introducing communal spaces on a decentralised basis incorporated into the circulation routes, unlike Share House LT Josai where integration is through means of proximity by use of compact corridors and vertical zoning. These results support the theoretical ideas that enhanced spatial integration and reduced depth enhance potential of social interaction and maintain the gradient of privacy (Hillier and Hanson, 1984; Hanson, 1998).

The examples also show that spatial efficiency is determined not only by decreased unit size but to a large degree it is highly mediated by configurational logic. The common infrastructure and reduced internal circulation as well as multifunctional spaces help achieve efficiencies in the use of space at the unit and building levels. However, the models vary in socio spatial focus. Wohnprojekt Wien believe in long-term community development with emphasis on the planning participation and spatial openness, but Share House LT Josai give emphasis on short-term living with tight compact private housing which is complemented by facilities.

Nevertheless, to their strengths, the two models reflect shortcomings. Participatory and highly integrated models require a high level of resident commitment and can be less accommodating to transient populations, and high-density co-living models are at risk of loss of spatial autonomy and need to express reliance on common facilities. Such differences demonstrate the necessity in configurational strategies being contextualised rather than global.

VIII. CONCLUSION

This paper shows how the configurational design is important in determining spatial efficiency and community integration in youth housing. Through the implementation of the Space Syntax theory and the comparative analysis of the case studies, the research demonstrates that those spatial setups determine the way in which young inhabitants navigate, use, and socially experience housing settings.

Key findings indicate that:
– The informal social interaction is represented by the spatial integration of shared spaces without impairing privacy.
– Effective housing designs rely on relational space logic and not unit size, though.
As well as in response to youth precarity and movement Flexible and adaptable configurations improve resilience.

On the basis of these conclusions, a few youth housing design principles may be suggested: a predominant emphasis on gradients of privacy, the integration of communal spaces into daily circulation, the minimisation of unnecessary space by means of shared infrastructure and adaptability through flexible designs.

The study has limitations of its qualitative nature and the small sample of case studies. Future studies might expand the comparative model to cover other cultural settings, quantitative spatial analysis, or longitudinal research on the experience of residents over time. Additional establishment of social data to configurational measurements may further elaborated what the relationship between spatial form and social sustainability in the youth housing is about in the long run.

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