BEST DISSERTATION
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Can We Trust Our Brokers in Property Transactions? A Spatial Perspective from Broker Density

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Introduction

The real estate industry in Hong Kong dates back to the 19th century, with a profound history and well-established management system. Due to a combination of factors like limited land resources, high population density, strong housing demand, and relatively tight housing supply, Hong Kong has a relatively active housing market with a high rate of housing turnover. Looking at the private housing turnover rate alone, Hong Kong's private housing turnover rate was nearly 7% in 2011, and even after a significant drop in 2012-2013 and 2021-2022, it remained close to 3% in 2022 (hk.crntt.com, 2023), apparently more optimistic when compared to the United States, where 19 out of every 1,000 homes slipped in the first half of 2019 to just 14 out of every 1,000 homes changing hands in 2023(Redfin Corporation, 2023).

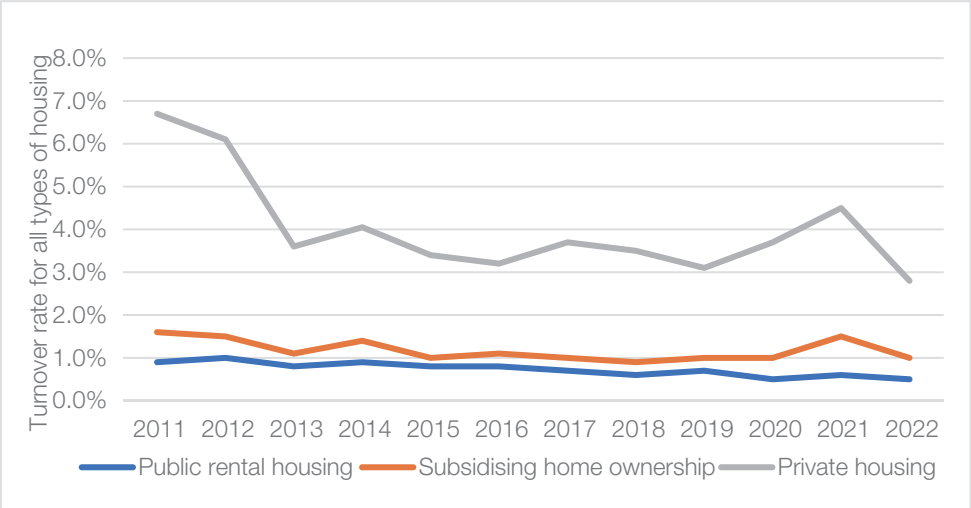

Fig.1 Turnover rates of different types of housing in Hong Kong (source: hk.crntt.com)

Unlike first-hand residences, the sale of second-hand properties lacks a formal information channel such as the "sales office". Based on the asymmetric information theory, when the party is better informed, he/she occupies a more favourable position, and the poorly informed ones occupy a less favourable position (Akerlof, 1970). Sellers need a reliable platform to release information about their properties, and buyers also need a trustworthy channel to obtain information about the properties. In the second-hand property market, brokers are responsible for releasing information, exchanging information between buyers and sellers, and communicating, coordinating, and facilitating transactions. As the exchange of information between the two parties is handled by the brokers, the availability of the brokers may affect the degree of information asymmetry.

Literature Review

Role of Brokers in Transaction

The information asymmetry theory by Akerlof (1970) explains the differences in the amount and quality of information owned by the two parties to the transaction, reveals the important role of information in the transaction, explains the necessity of brokers, and provides theoretical support for the development of the brokerage industry.

Brokerage behaviour is widespread in various industries. As claimed by Marsden and Peter (1982), brokers act as facilitators, contributing to transactions between other actors that lack trust. This definition has been further developed later, whether hired by which party, the intermediary actors can be called brokers as long as they facilitate the transaction. The major participants in the transaction process are the buyer, seller, and broker, and the main function of a broker is to match potential sellers and buyers to facilitate a transaction (Mantrala and Zabel, 1995).

Real estate, as a special durable good, has distinguishing characteristics that set it apart from other commodities. The residential property market is characterised by product heterogeneity, high information costs, and transaction costs (Elder, et al.,1999), characteristics that also make the birth and development of real estate brokers more significant and valuable.

The biggest advantage brokers have over the usual buyers is access to bulk information. Brokers have wider access to listing information, shorter search time, and more easily find suitable properties, reducing buyers' search time and lowering the cost of buyers' information search. Baryla and Ztanpano (1995) used national databases to compare transactions conducted with and without a broker, providing strong evidence that brokers can reduce buyers' search time. However, it does not mean that their involvement is always favourable to the buyers' interests. During the transaction process, brokers need to weigh their interests against the interests of facilitating the transaction for both parties.

For one thing, while a broker's earnings may be roughly based on the price of the transaction, the actual earnings are not so simple. Geltner, et al. (1991) examined the relationship between broker effort and transaction price, and they found that there may be a conflict between broker effort levels and prices when brokers' marginal gains from increased commissions are offset by cost savings from reduced workloads. Broxterman and Zhou (2022) described the imperfect, costly, or asymmetric information, as well as the curation of information asymmetries that market participants seek to profit from or even eliminate asymmetric information as "friction", residential brokers fail to fulfil trust requirements by treating their clients' transactions as their own, and agents buy their own homes at substantial discounts and sell their own homes at substantial premiums relative to the transactions they conduct on behalf of their clients.

For another thing, the broker also plays the role of a game player. By experimenting, Bazerman et al. (1992) found that using a broker increases the selling price of a property, with both the buyer and seller ultimately contributing to the commission, and since a failed transaction would leave the broker with nothing, the broker would minimise the bargaining range. Yavas, et al. (2001) further supported the idea that brokers increase the selling price, but unexpectedly, when brokers with more detailed information are included in the negotiation instead, the likelihood of reaching an agreement is significantly reduced. In sum, the benefits provided by brokers are more significant in the information search and matching stage, but will instead be detrimental to the deal in some circumstances.

Missing Role of Transaction

According to Levy, et al. (2008), even in the family decision-making when purchasing a house, brokers have the chance to influence the decision, they are not only the information brokers but also act as market makers. In the opinion of Gholipour Fereidouni (2012); Koch and Maier (2015); Besbris and Faber (2017), real estate brokers are an important factor in influencing the transaction price of a property. Their location, whether viewed in macro-panel data, from internet data or census tracts, number and activity are all likely to have an impact on the transaction price of a property, with areas with a high concentration of brokers generally experiencing higher house prices and rents.

Nevertheless, the role of brokers in transactions is always missed in traditional research on property transaction prices. By summarising and analysing the available literature, property transaction prices can be determined by a range of attributes inherent in structural, location and neighbourhood attributes (Yusof and Ismail, 2012). Chau, et al. (2003); Randeniya, et al. (2017) addressed three common attributes, made a list of commonly used housing attributes in hedonic price models, covering the distance from CBD, floor level, proximity to hospitals, etc, a series of attributes widely used to evaluate the three main attributes.

Despite the abundant research in this field, it is clear from all the studies that the relevant factor of the broker has never been taken into account as an attribute in the traditional hedonic model.

Based on the theories of information asymmetry, housing market search matching, and existing research findings, the first hypothesis is formed:

Hypothesis 1: The broker density around a second-hand property has an impact on its transaction price.

Competition among Brokers

Competition in the brokerage market is also created among different brokers. Yinger (1981) proposed a model of real estate broker behaviour that reveals the advantages of larger brokerages in information acquisition and matching. Schnare and Kulick (2009) examined the state of the brokerage market in terms of commission rates, refuting the notion of limited provider competition in "traditional" full-service brokers, and revealing differences in commission rates as markets change and over time. Expanding on previous research on competition in the real estate brokerage market, Cherbonnier and Leveque (2019) cut through the disclosure lens and found that competition does discourage broker bias to some extent and translates into a positive impact on listing and sales prices.

The brokers benefit from the commission after a deal is made. In other words, if the deal is not achieved eventually, the broker will gain nothing, or even suffer from loss (considering the efforts made in the process of searching for and matching information), so the broker will try to facilitate the deal. On the one hand, in the brokerage market, there is a limited number of clients. On the other hand, the state of the second-hand property market is not static, and brokers' strategies for facilitating transactions will differ in different market states, depending on the position of the buyer and the seller in the transaction.

Accordingly, the second and third hypotheses are formed:

Hypothesis 2: In the buyer's market period, the buyer is in a favourable position, to facilitate the transaction, the broker is more likely to sacrifice the interests of the seller, the higher the density of brokers around the second-hand property, the lower the transaction price.

Hypothesis 3: In the seller's market period, the seller is in a favourable position, to facilitate the transaction, the broker is more likely to sacrifice the interests of the seller, the higher the density of brokers around the second-hand property, the higher the transaction price.

Research Method

Hedonic Price Model

The transaction price of a property can be determined by a series of intrinsic attributes such as structural, locational and neighbourhood attributes. In this research, factors related to broker density are used as one of the attributes of neighbourhood attributes to explore the impact of broker density in the neighbourhood on transaction prices. To better control the unobservable time and location effects, fixed effects are also applied in this model.

$$P=\beta_0+\beta_1 X_1+\beta_2 X_2+\cdots+\beta_j X_j+\lambda_{planningunit}+\gamma_{fixedtime}+\varepsilon \qquad (equation1)$$

P denotes the transaction price of second-hand houses, β_0 is the intercept, β_1, β_2, $\cdots$ β_j are the regression coefficients of the respective variables, and ε is the error term. And X_1, X_2,$\cdots X_j$ are the individual attributes affecting house prices, including broker density, house floor area, number of bedrooms, etc., $\lambda_{planningunit}$ is the location fixed effect to control for heterogeneity across different planning units, and $\gamma_{fixedtime}$ is the time fixed effect to control for heterogeneity across different years.

Repeat Sales Model

The repeat sales model calculates the property price index by comparing the prices of the same property sold no less than twice in different periods. Since the same property sold in different periods has the same attributes (except for very few properties), the model defaults to the property's attributes being unchanged, and the use of the model effectively eliminates the heterogeneity of the property's attributes.

$$Y=a+b(M_2-M_1)+c(N_2-N_1)+d(W_2-W_1)+e(GDP_2-GDP_1)+f(Time\ Interval)+g \qquad (equation2)$$

Y represents the difference between the logarithm of the price at the second transaction and the logarithm of the price at the first transaction. a refers to the intercept, (M_2-M_1) is the Difference between the number of brokers at the second sale and the number of brokers at the first sale, (N_2-N_1) is the difference between the broker concentration at the second sale and the number of brokers at the first sale, (W_2-W_1) is the difference between the weighted scores of brokers at the second sale and the weighted scores at the first sale, and (GDP_2-GDP_1) is the difference between the GDP growth at the second sale and the GDP growth at the first sale. (Time Interval) is to estimate the transaction time interval. b, c, d, e, f are the regression coefficients of the respective variables, and g is the error term.

Analytical Framework and Result

Analytical Framework

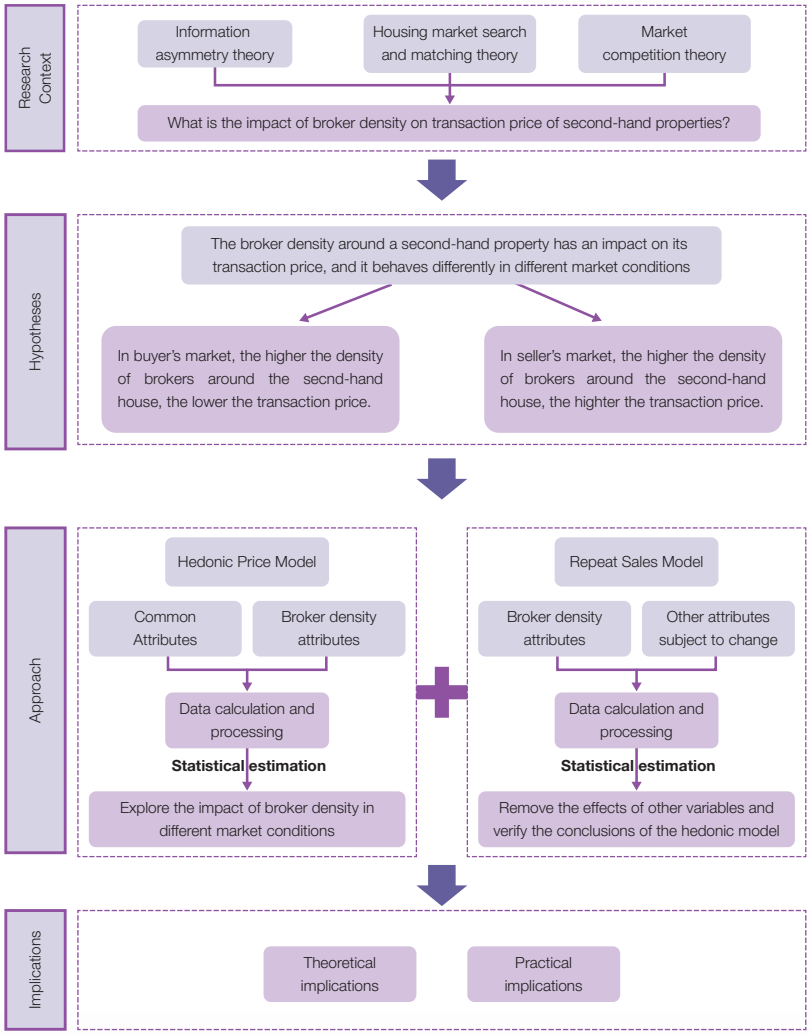

Fig.2 Analytical framework

Spatial Analysis

By obtaining all the records of single transactions of second-hand houses during the period from 2021 to the first quarter of 2024 as well as the records of the two-time transactions in these records whose previous transaction was located in the years of 2014-2016 via the Hong Kong Property website. The addresses of all real estate brokers in Hong Kong are obtained via the Hong Kong real estate agent platform.

Through the heat map for the point density analysis, the most highly distributed area of these properties is located in the south-western part of Sai Kung District, followed by the southern part of Tsuen Wan District, the area bordering Kwai Tsing District, and the northern part of Hong Kong Island East, Sham Shui Po District, Yau Tsim Mong District, and the central part of Shatin District. The distribution of brokers is concentrated in Sham Shui Po, Yau Tsim Mong, and Kowloon City districts, while the distribution in other districts is relatively less intensive.

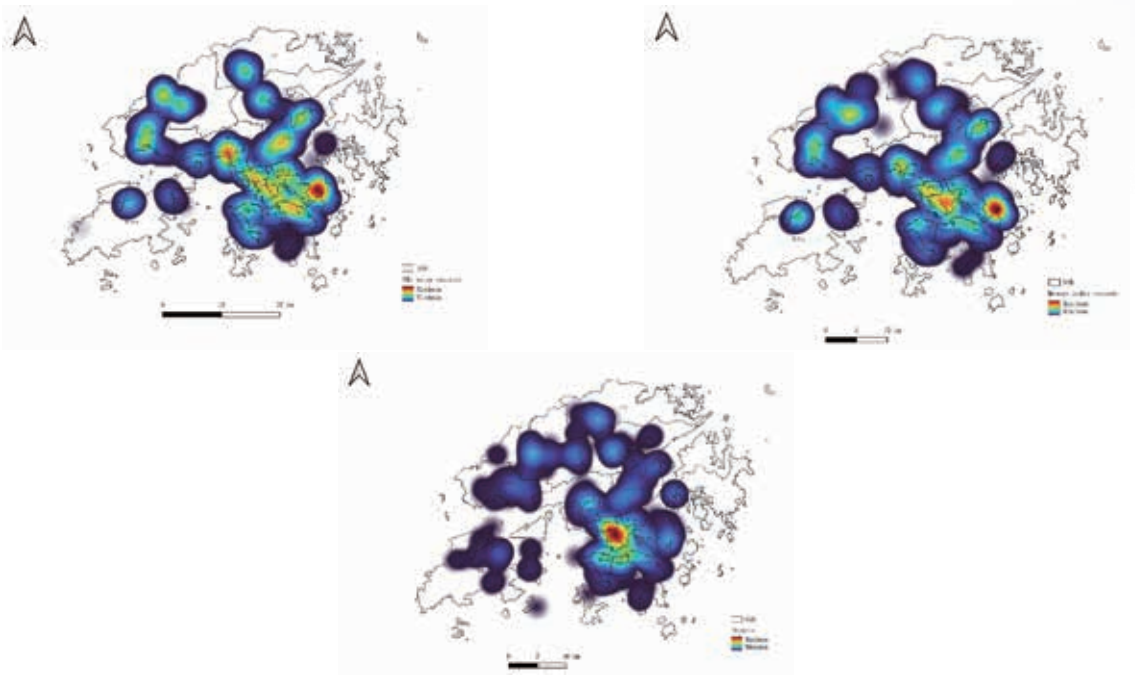

Fig.3 Distribution heat map of all transaction records, repeat sales records and brokers

Regression Results

By selecting and processing the transaction data according to the transaction date, the data located in the buyer's market period and the seller's market period were extracted through the time of the transaction and analysed again in the fixed effects model, fixing the time of the property transaction and the planning unit in which it was located.

Table 1. Estimated results of the main model and sub-models of fixed effect models

	Overall Model		Buyer's Market Model		Seller's Market Model	
Variables	Coef.	P>t	Coef.	P>t	Coef.	P>t
Structural Attributes						
Floor area	0.308097	***	0.299283	***	0.312699	***
Floor level	0.029644	***	0.027502	***	0.030870	***
Bedroom	0.051610	***	0.052435	***	0.049742	**
Neighbourhood Attributes						
Weighted average score of schools	0.091376	*	0.129020		0.064135	
Broker Attributes						
Broker concentration	0.020215		0.021598		0.014969	
Weighted scores of brokers	0.061496	*	0.056381	*	0.085596	**
Control V ariables						
Planning Unit	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Time	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

The weighted scores of brokers are significantly positively correlated with the transaction price in all three models but the degree of significance varies in different market states, with the overall model, the buyer's market is more significant than the seller's. From the coefficient estimate, the weighted scores of brokers in the seller's market have a greater impact on the transaction price compared to all the transaction records and the transaction records located in the buyer's market. Therefore, it can be inferred that weighted scores of brokers have a significant positive effect on transaction prices, but the effect and the degree of significance of the effect on transaction prices vary in different market conditions, and the effect is more significant and influential in the seller's market period than in the buyer's market period.

Based on the results of the above regression analyses, the first hypothesis is preliminarily verified, the density of brokers around second-hand properties has an impact on their transaction prices and the impact behaves differently in the real estate buyer's market period and the seller's market period. The results also rejected the second hypothesis. Broker density around second-hand properties also has a significant positive impact on transaction prices during buyer's market periods (although the regression coefficients are slightly lower relative to the regression coefficients of the overall model and the model during seller's market periods).

The data of repeated trades are also selected and processed according to the transaction time, and different groups of data are extracted by the transaction time. The data with two trading times in different market states are defined as the "changed market state" group, and the data with two trading times in the same market state are defined as the "unchanged market state" group. The two groups are then subdivided separately to obtain four groups of data: transition from buyer's market to seller's market, transition from seller's market to buyer's market, and maintaining in buyer's/seller's market.

Table 2. Estimated results of the GLS model

	Overall Model	Model with changed market state	Buyer to seller	Seller to buyer	Model with unchanged market state	Buyer & Buyer	Seller & Seller
(Intercept)	0.34189 ***	2.8722e-01 ***	3.21217632 **	0.039456	0.63445 ***	0.90079548 ***	-3.24986673 ***
Difference in the number of brokers	-0.10131 ***	-0.0085 ***	-0.01582763	-0.0072209 *	-0.016377 ***	-0.03360656 ***	0.00092707
Difference in broker concentration	-0.10174 ***	-0.0960 **	-0.11217110	-0.13281 **	-0.1033 *	-0.22897005 **	-0.13869905
Difference in weighed scores of brokers	0.0012197 *	0.0006	0.00349720	0.00051253	0.0036296 ***	0.00906061 ***	-0.00113410
Difference in GDP	-0.0010857	-0.0002	-0.19974030	0.0038018	-0.0035844 **	-0.00103932	1.82360519 ***
Transaction Interval	-0.000026204	-0.0000015	-0.00108484 **	0.00010559 ***	-0.00015332 ***	-0.00027428 ***	0.00068122 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Both the "Difference in the number of brokers" in the two transactions and the "Difference in the concentration" have a significant negative effect on the difference in the logarithm of the prices of the two transactions, whereas the "Difference in weighted scores of brokers" has a significant positive effect on the difference in the logarithm of the prices of the two transactions.

The first hypothesis can be equally verified that the density of brokers around the second-hand houses has an impact on their transaction prices and behaves differently in the period of real estate buyer's market and the period of seller's market (with a difference in the regression coefficients). Besides, the results of the analyses also reject the second hypothesis in the same way. It can be seen that the regression coefficients of all three models show the same effect (both positive and negative) regardless of the change in market status.

However, a comparison of the four market state subgroups shows that the results of the analyses produce significant differences. The sample in which both market states are in a seller's market is significantly different from all other groups in terms of both regression coefficients and significance, and both the GDP variable used to measure changes in the macroeconomic environment and the transaction interval used to control for the time effect are both significantly positively correlated, which is presumably due to the fact that the data of this subgroup is strongly influenced by the macroeconomic environment and that the sample with the most recent transaction is concentrated in the year of the better macroeconomic environment, leading to the bias in the results of the analysis. As for the "buyer to seller", it is due to the small sample size of the data (only about 1/100 of the total sample size) that the significance of the research variables cannot be tested.

By comparing results among subgroups, the change in the number of brokers is significant in the transition from a seller's market to a buyer's market and is particularly significant when both transactions are in a buyer's market. This also reflects that the negative effect of broker density on transaction price is significantly higher in the buyer's market than in the seller's market. And the broker concentration also shows a significant negative effect in several subgroups.

The results suggest that the "number of brokers" has a significant effect on transaction prices, with broker density having a significantly higher negative effect on transaction prices in a buyer's market than in a seller's market. The "broker concentration" is not significant in the hedonic model, but shows a significant negative effect on repeat sales price, which is presumably due to the influence of other unobserved variables in the hedonic model on transaction prices, and the effect is eliminated in the repeat sales price model due to the characteristics of the model. "Weighted scores of brokers" has a significant positive effect in the hedonic model, but the repeat sale model shows a significant positive effect only in the overall model and in the group where the market does not change.

Discussion and conclusion

Based on the information asymmetry theory, search matching theory, and market competition theory, this paper uses "the number of brokers within 500m" and "weighted scores of brokers" to measure the broker density, and the variable "broker concentration" is also added to further broaden the study of the impact of brokers on transaction prices.

By summarizing the results, the number of brokers around the second-hand properties not weighted according to the broker brand influence has a significant negative impact on the transaction price, while the overall influence of the brokers around the second-hand properties weighted according to the broker brand influence has a significant positive impact on the transaction price, this study shows that the density of the brokers around the second-hand properties has a significant impact on the transaction price, but this impact is significantly negative without considering the broker brand influence, that is, the higher the density of brokers in the neighbourhood, the lower the transaction price; while in the consideration of the broker brand influence is a significant positive impact, that is, the higher the density of brokers in the neighbourhood, the higher the influence, the higher the transaction price.

This study also found that the change in market state has some impact on the transaction price of second-hand properties, but it does not show enough impact to change the overall second-hand neighbourhood broker market and the trend, and even in a buyer's market, the overall influence of brokers (with weighted scores) in the neighbourhood of second-hand properties still has a significant positive impact on the transaction price. Similarly, even in a seller's market, the number of brokers in the neighbourhood that are not weighted by broker brand influence still has a significant negative effect on transaction prices, demonstrating the positive effect of broker brand influence and the negative effect of the number of brokers. In terms of the positive effect of broker brand influence, well-known brand brokers are usually more trusted and charge higher fees while providing quality services, which on the one hand implicitly filters the clientele and on the other hand, further raises the transaction price. In terms of the negative effect of the number of brokers, when the number of brokers in the region is high, competition intensifies and brokers may lower prices to facilitate transactions, and there may also be a bias in favour of the buyer's interests in order to facilitate the transaction leading to lower prices. Although changes in market conditions have had a moderating effect on these factors, they have not fundamentally reversed the overall trend.

This research is conducive to filling the gap in the study of neighbourhood broker density among the influencing factors of second-hand house transaction prices, providing a new perspective for the research in this field. On the practical level, it also provides some references for buyers and sellers when choosing a broker with expectations (especially when determining which region to choose from and which brand to choose).

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Unlocking Well-being: A Comparative Study of Well-being among Residents in Podium-style Gated Communities and Non-Gated Communities in Hong Kong

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Introduction

Hong Kong is characterized by its acute land shortage and dense population. These conditions necessitate vertical zoning, and a strategic mix of land uses to optimize available space for living. Podium-style gated communities (PSGCs) are the product in this context, characterized by multi-storey residential buildings with shared amenities on lower levels which are opened to the public and secured living units above for the exclusive use of residents. In contrast, non-gated communities (NGCs) offer open access to certain amenities by both residents and non-residents with limited restrictions. This study examines the differences of perceived well-being between residents of PSGCs and NGCs in Hong Kong's private housing sector. It explores 5 factors shaping the living experiences of residents in PSGCs and NGCs, naming (1) Perceived Economic Security; (2) Physical Environment Satisfaction; (3) Psychological Self-evaluation; (4) Perceived Health Status; and (5) Perceived Social Well-being.

The research literature on gated communities (GCs) is extensive globally, but studies specifically targeting the well-being outcomes of residents living in Hong Kong's GCs are notably lacking. Most existing research focuses on the perspectives of stakeholders like planners and developers, rather than the residents as end-users themselves. A comparative analysis between PSGCs and NGCs residents in Hong Kong could elucidate the perceived well-being of gated living. The findings of this research have the potential to impact urban planning and housing policies, leading to an enhancement in the quality of life within Hong Kong's urban environment. Moreover, the study could serve as a valuable reference point for other cities facing similar challenges.

Literature Review

Gated Communities (GCs)

GCs can be defined as residential areas or neighborhoods enclosed by physical barriers, restricting public access, and creating a sense of exclusivity, with controlled entry. The physical barriers, such as walls and fences, serve as boundary markers, separating the community from the surrounding urban environment (Atkinson and Blandy 2005; Blakely and Snyder 1999; McKenzie 2005; Miao 2003). These physical boundaries not only demarcate the spatial confines of the community but also serve as symbolic representations of social and economic segregation. (Kim 2006; Vesselinov et al. 2007).

GCs also offer a range of amenities and services exclusively for residents, such as recreational facilities, and landscaped communal areas (Atkinson and Blandy 2005), which contribute to the creation of a homogeneous living environment and build a sense of community among residents (Vesselinov et al. 2007). Furthermore, the physical barriers created by GCs may disrupt the urban fabric since deserted sidewalks and empty streets between the gates contribute to a fragmented urban landscape and interrupt the flow of urban life, negatively impacting the vitality and vibrancy of the city (Miao 2003).

Logan and Molotoch (1987) identified the existence of "Growth Coalitions," which consist of real estate developers, politicians, local media, and other related institutions, as driving forces behind the growth of GCs. The concept of "Gating Machine", which refers to the combination of interests and actions by local governments, real estate developers, the media, and consumers in promoting GCs was also introduced (Vessilinov et al. 2007). These concepts signify the convergence of interests between the above parties, leading to the increased fragmentation and privatization of space, and the proliferation of GCs.

Overall, GCs represent a complex phenomenon that embodies both the allure of safety and exclusivity and the challenges of social and spatial segregation.

Hong Kong Situation

In Hong Kong, the "Gating Machine" concept was applied to analyze the spread of GCs. Planners, developers, real estate agents, and property managers were identified as the key actors promoting GCs (La Grange 2014). The government's intervention in urban planning and real estate development played a significant role in shaping the development of GCs in Hong Kong. GCs in Hong Kong are predominantly found in densely populated urban areas due to the limited availability of land. They often take the form of high-rise apartment complexes (usually podium-style) and are strategically located for accessibility to urban amenities. Just like other places, GCs in Hong Kong prioritize controlled access points, security personnel, and surveillance systems to address concerns about burglary and maintain property values. Privacy is paramount.

Non-Gated Communities (NGCs)

NGCs are residential areas that have limited restricted access. These residential areas or neighborhoods lack physical barriers or gates restricting access to the public. In contrast to GCs, where entry to the estate is typically controlled through gates, guards, or other security measures, the estate area of NGCs is open and accessible to anyone without such restrictions. However, locating an entirely NGC in Hong Kong would prove to be a challenging endeavor. It is common for older single-block buildings to possess controlled entrances and surveillance systems.

Podium-style Gated Communities (PSGCs)

PSGCs are undoubtedly classified as GCs by the majority and represent a specific architectural design commonly observed in multi-storey residential developments. The lower levels, known as the podium, are dedicated to shared amenities like recreational facilities, while the residential units are situated on the upper levels. All these facilities located on the podium are for residents only and not open to the public unless you are accompanied by a resident. Security checkpoints are set at the entrance of the podium to prevent non-residents from trespassing. Commercial facilities such as shopping malls are typically located beneath the podium and are accessible to the public. However, residents of PSGCs still need to acquire services supporting necessary needs like medical services in the neighborhood area outside PSGC. The absence of self-sufficiency and the accessibility of non-residents to the areas under the podium contribute to the diminished exclusivity of PSGCs.

Conceptual Framework

Housing and Subjective Well-being (SWB)

Housing is a well-established social determinant of health and residents' subjective experience which could explain their health and well-being (Rolfe et al. 2020). To examine personal living experiences, subjective well-being (SWB) as a perceived, sustained, and positive state of satisfaction with life is an appropriate indicator since perceptions of life could be obtained by self-assessment, but not observation by others (Jawad, Scott-Jackson 2016).

Discussions on SWB appear to have parallels among four frameworks, which are Subjective Well-being by Jawad and Scott-Jackson (2016), Canadian Index of Wellbeing (2011), OECD Well-being Framework (2020), and Psychological Well-being by Ryff (1989). The common grounds applied for illustrating the concepts of SWB can be categorized into five major dimensions relating to economic, physical, psychological, environmental & health-related, and social well-being as shown in Table 1. These provide the foundation of the concept of well-being.

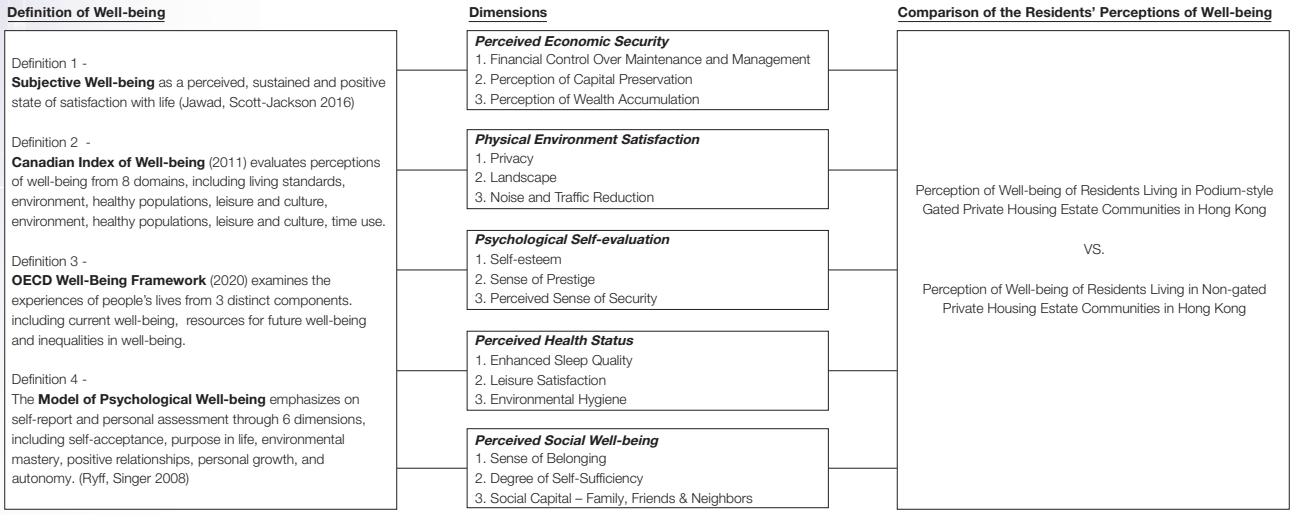
Conceptual Framework of Residential Well-being Index (RWI-ω)

To compare the self-perceived well-being of residents living in different PSGCs and NGCs in Hong Kong, SWB is taken as a separate thermometer which offers reliable measures to examine the perceived world of individuals (Camfield and Skevington 2008). Thus, a conceptual framework of RWI-ω as shown in Diagram 1 is developed for this research. RWI-ω is categorized into five dimensions with three components chosen for each dimension for evaluation.

Table 1 Conceptualization of Subjective Well-being (SWB)

Framework Dimensions	Subjective Well-being by Jawad, Scott-Jackson (2016)	Canadian Index of Wellbeing (2011)	OECD Well-being Framework (2020)	Psychological Well-being by Ryff (1989)
Economic Dimension	Socioeconomic advantages	Living Standards domain	Income and wealth dimension	–
Physical Dimension	Physical functioning advantages	Environment domain	Housing dimension	–
Psychological Dimension	Psychological advantages	Healthy populations domain	Safety Dimension	Self-acceptance dimension
Environmental & Health-related Dimension	Health advantages	Healthy populations domain; Leisure and culture domain	Environmental quality dimension; Health dimension	Environmental mastery dimension
Social Dimension	Interpersonal advantages	Community vitality domain	Social connections dimension	Positive relationships dimension
Other Dimensions	–	Democratic engagement domain; Education domain; Time use domain	Subjective well-being dimension; Work and job quality dimension; Knowledge and skills dimension; Work-life balance dimension; Civil engagement dimension	Purpose of life dimension; Personal growth dimension; Autonomy dimension

Diagram 1 Conceptual Framework of Residential Well-being Index (RWI-ω)



Methodology

Mixed-method Approach

In this research, a mixed-method approach is utilized, combining both qualitative and quantitative research methods in this research. This approach could enable us to get qualitative data from interviews with various stakeholders, which helps designing the questionnaires for data collection in the later survey.

Qualitative Method (Interview)

In-depth interviews were first conducted to gather qualitative insights to assist in the subsequent questionnaire's design. Twelve in-depth interviews with twelve different stakeholders having diverse background were carried out before the designing of questionnaires. The background of the interviewees is summarized in the following table:

Table 2 Interviewee Characteristics

Case No.	Age	Sex	Interviewee Characteristics
1	18 to 35	Male	Working, PSGC resident
2	36 to 50	Female	Working, PSGC resident
3	51 or above	Male	Non-Working, PSGC resident
4	18 to 35	Female	Working, NGC resident
5	36 to 50	Male	Working, NGC resident
6	51 or above	Female	Non-Working, NGC resident
7	N/A	Male	Government architect with experience in designing private PSGC.
8	N/A	Female	Property manger in private housing services.
9	N/A	Male	Property management director in private housing services.
10	N/A	Male	Former government town planner with experience in planning and development of urban residential areas.
11	N/A	Male	Social worker with experience of social/community services.
12	N/A	Male	Real estate agent with experience in selling residential properties.

The interviewee characteristics are outlined in Table 2 and purposive sampling method for the interview study is adopted. By selecting participants from different age groups, gender, employment statuses, and living arrangements (PSGCs and NGCs), a wide range of perspectives can be captured purposefully. Besides, professionals like architects, planners, housing managers and real estate agents provided expert knowledge and insights that built up an overview.

Qualitative Method (Case Studies)

Case studies on the sampled PSGCs and NGCs were also carried out before conducting the on-site survey. This involved an examination of characteristics, features, management practices, and resident experiences within these communities. Secondary data, site visits and first-hand photos taken were analyzed to provide specific context for our findings.

Quantitative Method (Survey)

Building on the insights obtained from the interviews and case studies, a survey to measure various dimensions of residents' perceived well-being in PSGCs and NGCs was designed. Elements covered in the survey are illustrated below in Table 3.

Table 3 Questionnaire Structure

Section No.	Dimension Measuring	Question Content
Section 1	Screening Questions	–
Section 2	Perceived Economic Security	Questions regarding residents' thoughts over maintenance budgets, expectations for capital gains and rental returns from leasing units.
Section 3	Physical Environment Satisfaction	Questions focused on residents' feelings of privacy, satisfaction with landscaping, greening areas, and the effectiveness of community design in reducing noise and traffic.
Section 4	Psychological Self-evaluation	Questions aimed to understand residents' levels of self-esteem, sense of prestige from their community, and perceptions of safety and security.
Section 5	Perceived Health Status	Questions about residents' physical activities, cleanliness of common areas and satisfaction with leisure facilities in the community.
Section 6	Perceived Social Well-being	Questions regarding the nature of social interactions with neighbours, suitable venues for family activities, and convenience of accommodating visiting friends and relatives within the community.
Section 7	Additional Questions	A few questions to capture and insights or comments from the respondents on future private housing trends.
Section 8	Demographics	Basic demographic information such as age, gender, occupation, and length of residence.

The targeted questionnaire respondents are residents aged 18 or above living in private PSGCs and NGCs in Hong Kong. A balanced representation from both types of communities is aimed to be achieved. Specifically, the questionnaire distribution targets obtaining responses from an equal number of participants residing in both PSGCs as well as NGCs, i.e., 90 recipients from PSGCs and 90 recipients from NGCs.

Table 4 Background of Estates for Survey

District	Estate	Category	Developer	Flat In Take Year	Flat Counts	Residents Count	Price per sq. ft. (HKD)	Physical Gates at the Estate Entrance
New Territories	City One Shatin	Non-Gated	Henderson/ New World/ Sun Kai/ Cheung Kong HKR	1980/10	10,642	25,819	12,481	No
	Discovery Park	Podium-Style CG	International/ New World	1997/04	3,360	6,210	12,900	Yes
Kowloon	Laguna Verde	Non-Gated	CLP/Cheung Kong	1998/03	4,723	14,972	19,222	No
	Park Avenue	Podium-Style CG	China Overseas/ Sino/MTR/ Sun Chung Estate/Kerry Properties	2001/02	2,935	9,610	20,530	Yes
Hong Kong Island	Lei King Wan	Non-Gated	Swire China	1988/05	2,295	6,576	15,031	No
	Island Resort	Podium-Style CG	Everbright/ Sino/Sun Chung Estate/ Vicwood Group	2001/04	3,098	9,438	15,735	Yes

Table 5 Survey Quota of Each Sampled Estate

Area	Estate	No. of Respondents	NGC/PSGC
New Territories	City One Shatin	30	NGC
	Discovery Park	30	PSGC
Kowloon	Laguna Verde	30	NGC
	Park Avenue	30	PSGC
Hong Kong Island	Lei King Wan	30	NGC
	Island Resort	30	PSGC

In addition, a geographical representation across Hong Kong's key regions is aimed to be achieved by selecting housing estates illustrated in Table 4. To control for economic factors, the chosen estates have comparable price per square foot and fall within a similar range of overall property values represented in the broader Hong Kong housing market. The total number of questionnaires conducted in each estate sampled is illustrated in Table 5.

Modified systematic sampling was adopted for the survey, which involves selecting elements from a larger population by starting at a random point and then picking every kth element, where k is a constant. This method reduces selection bias, as the systematic procedure eliminates subjective judgment in the selection of participants.

Hypotheses

Our research paper aims to compare the self-perceived well-being of residents living in PSGCs and NGCs.

Null hypothesis (H0): There are no significant differences in mean value of RWI-ω and sub-scores of each of the five dimensions composing RWI-ω between residents living in PSGCs and NGCs.

Alternative hypothesis (H1): There are significant differences in mean value of RWI-ω and sub-scores of each of the five dimensions composing RWI-ω between residents living in PSGCs and NGCs.

Research Findings

Descriptive Analysis

Our research survey targets 90 respondents each from PSGCs and NGCs, using modified systematic sampling to ensure demographic representation. Overall, the data suggests potential cultural or demographic variances between the two communities surveyed. The sampling methodology allows for a representative snapshot, enhancing the reliability of the findings. The comparative analysis across various demographic factors provides useful insights into the differing characteristics of the PSGC and NGC populations.

Perceived Economic Security

Our research examines perceptions of economic security between residents of Podium-Style Gated Communities (PSGCs) and Non-Gated Communities (NGCs). The statistical results of the study indicate that PSGCs' residents perceive a significant advantage in the maintenance and preservation of their estate facilities. This suggests PSGCs provide a more controlled environment leading to less wear on amenities. However, PSGC residents also reported higher management costs, likely due to fees for added security and maintenance services.

Despite the higher costs, PSGC residents place greater importance on facility preservation, perceiving this as enhancing long-term economic security. This indicates they are willing to accept higher management fees in exchange for slower depreciation and potentially higher property values over time. In contrast, NGC residents believe the absence of gates could reduce management costs. The findings highlight the nuanced trade-offs between the physical depreciation of facilities and the financial costs of managing gated versus non-gated communities. Residents seem to prioritize facility preservation even if it comes at a higher price.

Physical Environment Satisfaction

Furthermore, the perception of the impact of security gates on the physical environment from residents of both Podium-Style Gated Communities (PSGCs) and Non-Gated Communities (NGCs) are examined. Respondents from PSGCs believe gates do not hinder pedestrian flow, while NGC residents feel the absence of gates allows for more pedestrian movement. This suggests gates in PSGCs help create a more controlled and private environment.

Regarding noise reduction, PSGC residents feel gates are moderately effective, while NGC residents more strongly believe gates do not mitigate noise levels. This indicates gates in PSGCs may buffer against external environmental factors and provide a quieter living experience. The location of the communities also emerged as an important factor, with more remote estates experiencing less pedestrian and vehicular traffic regardless of gates.

Psychological Self-Evaluation

Besides, the questionnaire results indicate that residents of Podium-Style Gated Communities (PSGCs) experience better well-being in terms of self-prestige and perceived sense of security compared to those living in non-Gated Communities (NGCs). PSGC residents report a strong sense of security due to the security gates, with most agreeing or strongly agreeing that their sense of security has improved. In contrast, NGC residents predominantly disagree or remain neutral, indicating they do not perceive a significant improvement in security without gates.

This difference can be attributed to the multiple security checkpoints and controlled access points in PSGCs, which instill a psychological sense of protection and assurance in residents. Meanwhile, the absence of such security measures in NGCs can lead to a relatively lower sense of security, partly due to a culture of fear fostered by media coverage of crime.

For self-prestige, PSGC residents show a more varied perception, with a notable portion feeling neutral or disagreeing that security gates enhanced their sense of prestige. NGC residents predominantly feel neutral or disagree that the absence of gates diminished their prestige. However, a slight but significant difference is found between the two groups, suggesting PSGC residents may experience a greater sense of prestige associated with living in a secure, exclusive environment.

The desire for social status and distinction motivates many to seek out PSGC neighborhoods, which are seen as offering a higher social standing and privileged lifestyle.

Perceived Health Status

Meanwhile, the results also reveal a striking difference in how PSGC and NGC residents perceive the impact of security gates on estate cleanliness and hygiene. PSGC residents overwhelmingly agree that gates contributed to cleaner and more hygienic living conditions, with a high mean score. In contrast, NGC residents predominantly disagree, yielding a significantly lower average score. This disparity suggests PSGCs often have better maintenance and waste management practices, leading to cleaner environments that can reduce exposure to pathogens and promote resident well-being. The statistical analysis confirms a highly significant difference in perceptions between the two groups regarding the influence of security gates on estate cleanliness and hygiene.

Perceived Social Well-being

Self-Sufficiency and Management Quality

Regarding the effectiveness of management services in meeting residents' daily needs, both PSGC and NGC respondents expressed general satisfaction. A statistical comparison finds no significant difference between the two groups, suggesting the presence of security gates does not substantially impact residents' perceptions of management service adequacy.

This implies that residents' sense of self-sufficiency is less about whether they live in a gated community, and more about the competence of the property management. Effective management that caters to daily needs can foster self-reliance, diminishing the relevance of a community's gatedness in this respect. However, an alternative explanation is that self-reliance extends beyond the immediate living environment, drawing on the broader community resources outside the PSGC or NGC.

Social Capital with Friends and Family

In contrast, NGCs appear to offer residents greater perceived advantages when it comes to gaining social capital with friends and family. Most PSGC residents were neutral about the impact of living in a gated community on having more space for social activities, with a moderate average score. Conversely, NGC residents reported a statistically significant advantage, with a larger proportion agreeing or strongly agreeing that their community provides more space for socializing.

This finding highlights a notable difference in how the residential environment influences perceptions of social space based on the presence or absence of security gates. The open design and proximity to district centers of NGCs seem to facilitate a more welcoming atmosphere for social gatherings, enhancing residents' social capital. Additionally, the public facilities surrounding NGCs, such as parks, appear to play a crucial role in enriching the social experiences of their residents, in contrast to the more limited on-site amenities of PSGCs.

Overall, this underscores the importance of considering the holistic community environment, not just the presence of security gates, when examining the factors that shape residents' social well-being and connectedness.

Discussion

Residential Well-being Index (RWI-ω)

The Residential Well-being Index (RWI-ω) is significantly higher for residents of Podium-Style Gated Communities (PSGCs) compared to non-Gated Communities (NGCs). The RWI-ω for PSGCs is 68.36 on average, compared to 58.48 for NGCs. This indicates an overall advantage in residential well-being for PSGC residents.

Examining the sub-scores for each dimension, PSGC residents reported higher levels of perceived economic security, physical environment satisfaction, psychological self-evaluation, and perceived health status compared to NGC residents. The only dimension without a significant difference was perceived social well-being.

Comparing the sub-scores highlights the relative strengths and weaknesses of each community type. PSGCs excel in health, psychological, and physical environment aspects, while NGCs face more challenges in these areas. However, NGCs show stronger social connections with friends and family, despite lower overall residential well-being.

The analysis suggests that while Gated Communities foster a strong sense of internal community cohesion, the more open and integrated nature of NGCs enables broader social networks. This nuanced understanding of how residential design impacts social relationships is an important consideration in urban planning and community development.

Gating Machine

The research shows that residents of both gated and non-Gated Communities believe real estate developers play a crucial role in the rise of Podium-Style Gated Communities (PSGCs). In the market-driven context of Hong Kong, developers are seen as the primary instigators for the development of both PSGCs and non-Gated Communities (NGCs). This affirms the dominant market-driven nature of these housing developments.

NGCs residents see government intervention as playing a stronger role than property management companies in promoting the construction of PSGC, while PSGCs residents perceive property management companies as more influential than government intervention in the construction of PSGCs. This difference could be attributed to developers' significant influence not only in the planning and construction, but also in the ongoing management of PSGCs. Residents there may perceive property managers as crucial for maintaining standards and amenities, justifying higher management fees. In contrast, NGCs residents may see government services and infrastructure as more impactful on their daily lives.

Conclusion

Concluding Remarks

This study seeks to understand the broader implications of Hong Kong private podium-style gated communities (PSGCs) and non-gated communities (NGCs) on the well-being of their residents. While key features and characteristics defining PSGCs within Hong Kong are identified and comparison of residents' perceived well-being in PSGCs to that of their counterparts residing in private NGCs is made, it is also discovered that the Hong Kong Government is in a critical position for allocation of lands and putting restrictions on the development of PSGCs from our research.

The Prevalence of PSGCs as a Hong Kong-Style GCs

Hong Kong's acute land shortage and dense population necessitate strategic vertical zoning and mixed land use to optimize living space. To meet the demand for peaceful, quality living, developers are incentivized to construct private podium-style gated communities (PSGCs). These vertically designed communities create a serene, orderly atmosphere shielded from the city's hustle and bustle.

In Hong Kong's urban development, public facilities could be planned and initiated by the Government, while being built and developed by developers. By enforcing land lease conditions, developers are required to include public amenities like transportation hubs on private lands. This integration of public and private spaces is a key urban planning strategy. The prevalence of PSGCs is a deliberate response to market demands, as developers aim to contribute to residential well-being. Research findings show that PSGC residents perceive higher levels of well-being compared to those in non-gated communities.

Improvement on Residential Well-Being in NGCs

Non-gated communities (NGCs) in Hong Kong, developed primarily in the 1970s and 80s, may not offer the same privacy and exclusivity as private podium-style gated communities (PSGCs). However, the open spaces in NGCs provide an invaluable platform for social integration, community engagement, and vibrant community life.

The research findings suggest that the physical gates and management measures in PSGCs contribute to better perceived well-being in four out of five dimensions of the Residential Well-being Index (RWI-ω) compared to NGCs. With limited redevelopment opportunities in the short term, practical strategies to improve life in NGCs include enhancing property management services and promoting social interactions.

Enhancing the responsiveness of property management companies to residents' dwelling and leisure needs can improve the Perceived Social Well-being in NGCs. Providing value-added services like umbrella borrowing and taxi calling can demonstrate attentiveness to residents' subtle needs.

Furthermore, research finds that NGCs residents tend to perceive better well-being in hosting family and friends for social activities. To encourage communication and interaction, the government could subsidize estate management companies to organize festive events and social activities in the open spaces of NGCs, such as riddle games, sports competitions, and charity bazaars. This can leverage the open spaces in NGCs more effectively and foster a stronger sense of community.

Limitations

This study understands perceived social well-being from the perspective of residents living in PSGCs and NGCs. However, the relation between social interaction, self-sufficiency of the estate, and physical design of housing development is unclear. In addition, social cohesion relies on the interconnection among citizens. The effects of housing design and urban planning shall be further explored. Extending the scope of study from housing estates to the surrounding neighborhood community to gain knowledge of the perception of well-being from the perspectives of people actively living and working nearby the residential developments would be a desirable starting point. Recognizing opinions of different groups of people in the community would offer a more comprehensive picture for capturing the interplay between residents and their neighborhood.

Furthermore, GCs are presented in different styles other than PSGCs in Hong Kong. Apart from low-density residential developments, more high-rise buildings on small sites with finite provision of shared amenities for residents and few shops underneath were constructed in recent years. While this kind of "small-scale PSGCs" shares the features of PSGCs, the scale limits the size of resident community and variety of shared amenities. The living experiences in small-scale PSGCs could be divergent when comparing to that of PSGCs. Thus, findings in this research may hardly generalize the residential well-being perceived by residents in all kinds of GCs in Hong Kong.

Future Research on the Moderating Effect of Urban Planning on Well-being

In conclusion, while residents of private podium-style gated communities (PSGCs) in Hong Kong generally have better overall residential well-being than their non-gated community (NGC) counterparts, it is crucial to balance the exclusive benefits of gatedness with the need for social inclusivity and public facilities provision. The effectiveness of PSGCs and NGCs is context-dependent, relying on careful consideration of local conditions like land availability, population growth, and urban planning.

By refining urban planning strategies and understanding the unique characteristics of Hong Kong's housing market, the well-being of all residents, both within and outside PSGCs, could be enhanced. Despite thorough town planning prescriptions, research on their impacts on well-being is necessary to review their effectiveness in catering to Hong Kong's compact city development and high population density. This can reveal the satisfaction level of end-users and address the conflicting interests between public and private sectors.

The government could consider using the Residential Well-being Index (RWI-ω) introduced in this study to conduct quantitative research in both public and private housing sectors, to allocate the scarce land resources wisely.

Overall, the combination of NGCs and PSGCs in Hong Kong demonstrates a pragmatic and adaptive approach to residential development, allowing efficient land use and diverse housing options. Future research can further investigate the specific factors contributing to the success of each residential development type from the perspective of objective well-being, providing valuable insights for urban planning and housing policies in Hong Kong and beyond.

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