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DETERMINANT FACTORS OF NEIGHBOURHOOD QUALITY INFLUENCING RESIDENTIAL MOBILITY BEHAVIOUR IN PENANG ISLAND

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Abstract

Residential mobility behaviour is about people's choices and preferences whether to remain at the present house and neighbourhood, or to move out. Moving to another house or neighbourhood entails a deliberate decision that require various considerations by the residents involved especially in dealing with housing adjustments, life neccesities and financial matters. Residents' perceptions of their housing and neighbourhood can be indicative of their intention to stay in or move out. The act of moving is often asssociated with lower levels of satisfactions with residents' current housing and neighbourhood environment, thus activating self-preference and residential mobility. This study aims to identify the determinant factors of neighbourhood quality that influence residential mobility behaviour in neighbourhoods in Penang Island. The nine attributes of neighbourhood quality dimensions included in this study are dwelling features, dwelling utility, neighbourhood facilities, greenery, accessibility, public transportation, environment, economic livelihood, and neighbourhood interaction and attachments. A total of 717 heads of households residing in Penang Island were involved in the questionnaire survey. Using logistic regression method, the study findings reveal that four factors of dwelling features, facilities, neighbourhood environment, and neighbourhood interaction and attachments are significant in influencing residents' intention to move. Moreover, both internal and external factors of housing and the neighbourhood can influence the residents' decision to stay in or to move out, thus implying important policy measures for local housing.

***Keyword**:* Residential mobility behaviour, residential mobility intention, residential satisfaction, neighbourhood quality attributes

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INTRODUCTION

An insight into people's motivation and decision to move to another house or neighbourhood is critical towards an understanding of residential mobility. A classic view postulates that residents move as an adjustment to changes in family life course (Rossi, 1955) such as birth, death, marriage, divorce and change in social status. Family life cyle still remains as a dominant influence in the residential mobility process. Over time, literature presents a multi-dimensional framework to analyse poople's underlying reasons to move. They include family transition (Geist & McManus, 2008), employment opportunity (Kronenberg & Carree, 2012), social network support (Oishi et al., 2013), neighbourhood attributes (Coulton et al., 2012) as well as urban policy and design principles (Emami & Sadeghlou, 2020). Nonetheless, linkages between residential mobility and residential satisfaction have received much emphasis in view of enhancing well being and quality of life among residents in metropolitan areas (Oh, 2020).

Residential satisfaction is an integral variable to understand residential mobility. Residential satisfaction is a complex concept measured in multi-context views derived by combining different attributes within explicative models and relationships between sets of predictors or criteria (Bonaiuto et al., 1999). Residential satisfaction depicts the individuals' and households' personal choice and preference for particular types of dwellings and neighbourhoods (Huang & Du, 2015). Studies showed that perceptions and satisfaction measures for dwelling and neighbourhood can influence residential mobility behaviour (Hedman, 2011; Jones & Dantzler, 2020; Parkes & Kearns, 2003). Mobility intentions and residential mobility can be determined through the residents' satisfaction assesments of their house and neighbourhood. Thus, moving in or out of the house either within or across neighbourhoods is indicative of numerous reasons and justifications why residents decide to leave and settle elsewhere.

Neighbourhood quality consists of inclusive dimensions in residential mobility measurements encompassing physical, social and economics perspectives. Prior studies indicate that good neighbourhood quality does not directly trigger residential mobility or vice versa (Boehm & Ihlanfeld, 1986; Parkes & Kearns, 2003). In fact, the trajectories for residential mobility decisions are still open to debates especially on particualr neighbourhood attributes that can affect the decision to move among residents This study therefore aims to determine the factors of neighbourhood quality which can influence the residents' mobility decisions based on a case study in Penang Island.

RESEARCH BACKGROUND

Mobility intention or thought can be referred to as the purposeful act of thinking, considering, wishing, willing, planning or expecting to move (de Groot et al., 2011). It is indicative of a wish to leave the house or neighbourhood (Lee et al., 1994). Prior research assert that an expectation or a plan to move is a close proxy

to mobility behaviour, more so than a desire or consideration to move (Kley & Mulder, 2010). Likewise, mobility intention or thought also relates to residential mobility decision (Coulter & Scott, 2014). Literature highlights residential mobility behaviour can be predicted by residential satisfaction (Francescato et al., 1989; Liu, 1999) and residential quality (Galster & Hesser, 1981). Residential mobility behaviour unravels the conditions of housing and neighbourhood which allure residents' to move in or move out.

Theories of residential satisfaction accentuate various indicators which measure a difference or gap between the residents' actual housing conditions and their desired dwelling and neighbourhood environment (Emami & Sadeghlou, 2020; Galster & Hesser, 1981). Residential mobility and residential satisfaction applys a similar approach in which both encounter a gap, mismatch or discrepancy between the present housing consumption and residential preferences or desired future housing. The instrument of residential satisfaction assessment both in general or specific terms may well lead to particular mobility action or behaviour (Varady, 1983). As such, an incongruity between actual residential satisfaction and desirable residential norms can bring about remedial situations such as reconsideration of satisfaction assessment, housing need adjustment and moving to another place that matches the residents' conformity and aspirations (Mohit et al., 2010; Morris & Winter, 1975). Hence, the gap or mismatch that the residents experience provides a strong basis to assess their satisfaction levels with current dwelling and neighbourhood and their move intentions.

Prior studies explicitly describe the neighbourhood dimensions which are associated with residential satisfaction among the residents (Mohit et al, 2010; Mohit & Adel Mahfoud, 2015). The residents' present living condition enables them to gauge their housing needs and preferences by comparing between expectations and reality. Specifically, the attributes in the neighbourhood context consist of neighbourhood facilities (Yi & Lee, 2014), neighbourhood greenery (Andersen, 2011), accessibility (Osmadi et al., 2015), public transportation (Andersen, 2011), neighbourhood environment (Dawkins et al., 2015), economic livelihood (Ferreira et al., 2010), and neighbourhood interaction and attachment (Dassopoulos & Monnat, 2011). Residents' reactions and responses toward their present house and neighbourhood affect their satisfaction levels which trigger related mobility behaviour such as moving house or housing adjustments.

METHODOLOGY

Data for this study were collected using a questionnaire survey of 717 heads of households using stratified sampling from 10 housing locations in Pulau Pinang (*Profil Bandar Pulau Pinang*, 2009). These housing locations are Bayan Lepas, Bayan Baru, Sungai Ara and Balik Pulau in Barat Daya District; and Tanjung Bungah, Tanjung Tokong, George Town, Jelutong, Air Itam and Sungai Dua–

Sungai Nibong in Timur Laut District. Logistic regression method was performed to determine which attributes of neighbourhood quality have significant effects on residential mobility intention. The logistic regression model has nine independent variables and a dichotomous (binary) dependent variable of Yes or No response categories, see **Table 1**.

Table 1: Coding variables and description of Neighbourhood Quality

Variables	Descriptions
All items in:	1 : (very dissatisfied and dissatisfied) 0 : (slightly satisfied, satisfied, very satisfied)
1) Dwelling features	1 if the household is dissatisfied, 0 is satisfied
2) Dwelling utility	1 if the household is dissatisfied, 0 is satisfied
3) Neighbourhood facility	1 if the household is dissatisfied, 0 is satisfied
4) Neighbourhood greenery	1 if the household is dissatisfied, 0 is satisfied
5) Neighbourhood accessibility	1 if the household is dissatisfied, 0 is satisfied
6) Neighbourhood public transportation	1 if the household is dissatisfied, 0 is satisfied
7) Neighbourhood environment	1 if the household is dissatisfied, 0 is satisfied
8) Neighbourhood economic livelihood	1 if the household is dissatisfied, 0 is satisfied
9) Neighbourhood interaction and attachment	1 if the household is never/occasionally and strongly disagree/disagree; 0 is seldom/frequently/always and slightly agree/agree/ strongly agree

Source: Fattah (2017)

The questionnaire for this study was developed based on a careful review of the literature. A hoslitic framework of neighbourhood quality factors was adopted including physical environment, social attributes and economic livelihood features. Physical environment features consist of dwelling features, dwelling utility, neighbourhood facilities, greenery, accessibility, public transportation and environment. While social attributes and economic livelihood features have neighbourhood interaction and attachment, and neighbourhood economy, respectively. Combining these groups of neighbourhood quality dimensions provides a comprehensive tool for neighbourhood assessment.

On the housing component, the questionnaire employs the *dwelling features* dimension consisting of satisfaction with the living room (Opoku & Abdul Muhmin, 2010), kitchen (Andersen, 2011), dining room (Salleh, 2008), bedroom (Woo & Morrow-Jones, 2011), bathroom (Elsinga & Hoekstra, 2005) and design of room arrangement (Jansen, 2014); while the *dwelling utility* emphasizes the residents' satisfactions toward electical and water supply (Salleh, 2008). On the neighbourhood component, the residents are inquired about their satisfaction level towards the availability of *neighbourhood facilites* within their neighbourhood such as hospital, community hall, police station, market (Mohit & Azim, 2012) and mini mart (Salleh, 2008). The study also queries about residents' satisfaction towards *neighbourhood greenery* such as recreational park (Ho et al., 2015) and landscape provision in the neighbourhood (Andersen, 2011).

The questionnaire also incorporates *neighbourhood accesibility* measurements such as residents' satisfaction levels with travel time to activity places with less traffic jam (Woo & Morrow-Jones, 2011) and home-work travel distance (Witten et al., 2008). The p*ublic transportation* dimension places an emphasis on satisfaction levels with frequency of bus service (Pacione, 2003), availability of public transport (Go & Lee, 2012) and facilities at the bus stop (Day, 2013). Moreover, indicators of *neighbourhood environment* are considered in terms of satisfaction levels towards cleanliness in the neighbourhood area (Woo & Morrow-Jones, 2011), maintenance, security (Hur & Nasar, 2014) and privacy (Jansen, 2014) within the nighbourhood. The study also used the criteria of *neighbourhood economic livelihood* to determine satisfaction levels towards employment and income opportunities (Greenwood, 2014), cost of living (Hui et al., 2012) and housing price (Tan, 2012). Finally, factors of *neighbourhood interaction and attachment* are identified in terms of the residents' level of agreement with the neighbours (Hamdan et al., 2014), frequency of contacts with neighbours (Baum et al., 2010) and satisfaction levels with social mix in the neighbourhood (Permentier et al., 2009).

RESULTS

The study employs a logistic regression method due to the nature of the dependent variable of mobility intention, which is a dichotomous (binary) measure with two response options (Yes or No). The full logistic regression model shows results of $\chi 2$ (9, N = 717) = 83.539, $p < .001$, which indicates that the developed model is able to distinguish significantly between those residents who have an intention to move out and those residents who wish to stay in, see **Table 2**. The model indicates that between 17.3% (Cox & Snell R2) and 23.1% (Nagelkerke R2) of the variance have residential mobility intention and they are classified correctly at 65.7% in the neighbourhood quality attributes.

Equation 2 shows the regression formula y = a + bx; while Equation 3 shows the four independent factors (χ) of neighbourhood quality that are found to be significant in affecting residential mobility intention (y). These significant neighbourhood qualities are neighbourhood interaction and attachment ($\chi 1$), dwelling features ($\chi 2$), neighbourhood environment ($\chi 3$) and neighbourhood facilities ($\chi 4$). **Table 3** shows the full results of logistic regression by using enter approach in which all variables in a block are entered together in a single step.

Table 2: Factors of Neighbourhood Quality affecting Residential Mobility Intention

	B	S.E	Wald	Df	Sig	Exp (B)	95% C.I for EXP(B)	
Neighbourhood Quality:							Lower	Upper
1) Interaction & Attachment	.980	.209	22.066	1	.000	.375	.249	.565
2) Economic livelihood	-.341	.200	2.908	1	.088	.711	.481	1.052
3) Environment	.505	.213	5.599	1	.018	.604	.094	1.593

4) Accessibility	.300	.200	2.236	1	.135	1.350	.397	.917
5) Public Transport	-.088	.133	.440	1	.507	.915	.911	1.999
6) Greenery	.169	.112	2.289	1	.130	1.184	.705	1.188
7) Facilities	.406	.196	4.274	1	.039	1.501	.951	1.473
8) Dwelling Utility	-.192	.216	.791	1	.374	.825	.540	1.261
9) Dwelling Features	.640	.199	10.300	1	.001	.527	.357	.779
Constant	6.321	1.009	39.282	1	.000	556.032		
Model -2LL				526.422				
(χ2)				126.78; df - 16 p= .000				
Cox & Snell R2				.173				
Nagelkerke R2				.231				

Source: Fattah (2017)

Factors of Neighbourhood Quality affecting Residential Mobility Intention

$$y = \alpha + b1\chi1 + b2\chi2 + b3\chi3 + b4\chi4 + e \ldots\ldots (2)$$

Y = Mobility Intention
α = Constant
B = Regression coefficients
χ1 = Neighbourhood Interaction nd Attachment
χ2 = Dwelling Features
χ3 = Neighbourhood Environment
χ4 = Neighbourhood Facilities
e = Standard error

$$y = 6.321 + 0.980\chi1 + 0.640\chi2 + 0.505\chi3 + 0.406\chi4 + 1.009 \ldots\ldots (3)$$

Source: Fattah (2017)

Table 3: Full model of Logistic Regression on Factors of Neighbourhood Quality affecting Residential Mobility Intention

IV(Neighbourhood Quality)	DV- Residential Mobility Intention [B (S.E)]								
	1	2	3	4	5	6	7	8	9
1) Interaction & Attachment	1.123 (.190) ***	1.042 (.192) ***	.934 (.195) ***	.932 (.195) ***	.942 (.196) ***	.977 (.200) ***	1.020 (.204 ***	1.010 (.206) ***	.980 (.209) ***
2) Economic Livelihood		-.463 (.172)**	-2.65 (.182)	-.337 (.193)	-.326 (.194)	-.332 (.194)	-.319 (.195)	-.346 (.198)	-.341 (.200)
3) Physical Environment			.591 (1.75)**	.651 (.183)***	.646 (.183)***	.720 (.196) ***	774 (.201)***	.620 (.210)**	.505 (.213)*
4) Accessibility				.208 (.177)	.257 (.191)	.256 (.191)	.256 (.193)	.317 (.197)	.300 (.200)
5) Public Transport					-.083 (.123)	-.070 (.124)	-.115 (1.29)	-.124 (.131)	-.088 (1.33)
6) Greenery						.116 (.107)	.100 (.108)	1.32 (.110)	.169 (.112)
7) Facilities							.236 (.183)	.372 (.194)	.406 (.196)*
8) Dwelling Utility								-.497 (.193)*	-.192 (.216)
9) Dwelling Features									.640 (.199)**

Source: Fattah (2017)

IV(Neighbourhood Quality)	DV- Residential Mobility Intention [B (S.E)]								
	1	2	3	4	5	6	7	8	9
Constant	3.565 (.611)	4.845 (.798)	5.873 (.868)	5.606 (.896)	5.705 (.911)	5.695 (.911)	5.352 (.943)	5.999 (.988)	6.321 (1.009)
Model -2LL	568.055	560.613	548.653	547.255	546.799	545.612	543.932	537.206	526.422
Cox & Snell R2	.091	.106	.130	.133	.134	.136	.139	.152	.173
Nagelkerke R2	.121	.141	.173	.177	.178	.181	.186	.203	.231

DISCUSSION

From the nine independent variables of neighbourhood quality, four variables have shown statistically significant contributions to the model in influencing residential mobility intention. They are neighbourhood interaction and attachment, dwelling features, neighbourhood environment and neighbourhood facilities. The first factor of *neighbourhood interaction and attachment* is found to be statistically significant in affecting residential mobility intention with a value of $B = .980$, $p \leq .001$. The B value shows a negative direction and the odd ratio value is less than 1. These findings imply that residents who are dissatisfied, disagree or only occasionally interact with their neighbours are more likely to move out in the future. Neighbourhood interaction and attachment, which is illustrated by the degree of social networkings, shared thoughts and experiences among the neighbours, is found to be significant in influencing residential mobility intention. Casual social activities in the neighbourhood such as chatting buddies, helping each other and social recreation have indirectly created internal bonding among the residents. Consistent with findings of prior studies, frequent socialising and contacting with their neighbours reveals the residents' sense of attachment and belonging to the neighbourhood (Baum et al., 2010; Ghorbanian, 2011). Such social ties may not be directly visible but a sense of comfort and meaningful comradeship is developed among residents who have known each other in the neighbourhood. In fact, higher levels of satisfaction with neighbourhood attachment and interaction can reduce the probability of residents moving out.

The second factor of dwelling features is also statistically significant in influencing residential mobility intention with a value of $B = .640$, $p < .01$. Residents who are dissatisfied with their dwelling features are more likely to move in the future (odd ratio value < 1). Likewise, residents who are dissatisfied with living room, kitchen area and room design arrangement are likely to move out. Dwelling features are the only housing component that significantly affect residential mobility intention. Residents are more likely to move in the future (odd ratio value < 1) if they voice dissatisfactions with dwelling features. On the contrary, those residents who are moderately satisfied with the dwelling features are less likely to move. Dwelling layout and room arrangement might not appear

aesthetically appealing to residents if they do not complement their desires. Nevertheless, those who are dissatisfied with their dwelling layout may choose to renovate and improve their house accordingly, but with their own budget. Previous studies also show moderate satisfaction levels with the dwelling features among residents (Mohit et al., 2010; Salleh, 2008; Salleh et al., 2013). An assumption can be made that the residents would be interested to raise their satisfaction level with regards to dwelling features.

The third factor of neighbourhood environment is also found to be statistically significant in affecting residential mobility intention with a value of $B = .505$, $p < .05$. Residents who are dissatisfied with their neighbourhood environment are likely to move in the future (odd ratio value < 1). Likewise, residents who feel dissatisfied with neighbourhood cleanliness, maintenance, security and privacy are likely to move out to settle elsewhere. The significant relationship found between neighbourhood environment attributes and residential mobility intention indicates that the residents who are moderately satisfied with the neighbourhood environment are less likely to move. Neighbourhood environment is considered as an important factor to residents since unfortunate incidences of poor maintenance and air pollution from traffic congestion can indirectly affect their livelihood. An unhealthy neighbourhood environment might put some strains on some residents forcing them to leave their residence and settle in healthier neighbourhoods. This study finding also shows that those who are dissatisfied with the security level in the neighbourhood are triggered to move out. This finding is parallel with the fact that a secure and safe environment is a quality-of-life factor that satisfies the residents (Maliene & Malys, 2009). Similarly, the rising problem with neighbourhood security is indicative of a trend in mobility pattern (Moser, 2009). Nevertheless, neighbourhood environment is considered as a priority for residential satisfaction regardless if the decision to move is on the line.

The fourth and final factor of neighbourhood facilities has a significant influence on residential mobility intention with value of $B = .406$, $p < .05$. Analysis shows that residents who are dissatisfied with neighbourhood facilities such as mini mark, pedestrian walkway, religious place and hospital are more likely to move out. This factor shows a high probability of residents' moving out with odd ratio value more than 1. Neighbourhood facilities are statistically significant in affecting residential mobility intention, which is found the be the strongest predictor in neighbourhood quality attributes, Residents who are dissatisfied with neighbourhood facilities are 1.5 times more likely to move in the future. Likewise, residents who are moderately satisfied with the neighbourhood facilities are less likely to move. In hindsight, this finding is supported by prior study that shows that higher satisfaction levels in neighbourhood facilities would less likely trigger residential mobility and vice versa (Boehm & Ihlanfeld, 1986). Notwithstanding, this study places an

emphasis on a holistic framework of neighbourhood quality attributes encompassing physical, social and economics components to assess the effects of likelihood of mobility intention by residents. Provision of adequate facilities, equipments and services in neighbourhoods is a priority to enhance satisfaction levels among neighbourhood residents.

Findings in this study found that other five attributes of neighbourhood quality such as economic livelihood, accessibility, public transportation, greenery and dwelling utility do not fit with the model with a significance level p >.05. This means that they are not significant in explaining residential mobility intention at 95% confiudence level. Nonetheles, it is noteworthy that these neighbourhood quality attributes are still regarded very important for residents' satisfaction. For instance, neighbourhood economic livelihood which measures income and employment opportunities, is an vital component that stimulates the residents' ability to hold and organize income-generating activities at the neighbourhood level. An economic variable is always a prominent factor in residential decisions (Tannier et al., 2015). People are often influenced to move to a new place which offers relatively lower living costs with similar benefits (Hui et al., 2011). Any moving activities should be linked with the local economy as an attraction. By the same token, other studies highlight the importance of accessibility in the neighbourhood as a major determinant for future mobility. If accessibility is high, then the probability of future mobility decreases accordingly (Alkay, 2011). In addition, neighbourhood accessibility indicates location attributes which are reachable within a specific time. Location attributes and accessibility are considered beneficial to residents because such information help them relate spatially to the entire urban area (Guo & Bhat, 2007). Thus, accessibility does have an impact for an intention to move in the future.

This study findings found that the factors of neighbourhood quality are very important considerations in analysing residential mobility behaviour. Although their impacts may vary by city and places, neighbourhood quality presents a recent trend for residents' preferences for moving. The study findings highlight the significant factors of neighbourhood quality which affect residential mobility intention.

CONCLUSION

Neighbourhood quality attributes are one of the dimensions that characterized the motivations and justifications for residential mobility decision. The inclination of moving in or moving out of a house in a neighbourhood context reflect the different perceptions and experiences among the affected residents. Moving to a reputable neighbourhood would be beneficial in terms of an enhanced neighbourhood quality and satisfaction level. On the contrary, moving out of the neighbourhood shows dissatisfaction and mismatch of housing consumption with

residential preference and future needs. Hence, residents' satisfaction and perception might differ and change over time and space.

Results of this study show four factors of neighbourhood quality that significantly influence residential mobility intention. The factors are neighbourhood interaction and attachment, dwelling features, neighbourhood environment and neighbourhood facilities. The study finding also indicates that moving behaviour relates to financial sources which is a main obstacle especially those of the lower income category. While all residents wish to live in their desired and preferred house and neighbourhood, yet they could not do so due to lack of funding and limited resources. More efforts should be geared to understand residential mobility trends in Malaysia. A better understanding of mobility decisions is essential to predict future changes of residential preference. From a public policy perspective, it is essential that local housing development project incorporates all the attributes of neighbourhood quality to ensure that the housing provision and neighbourhood environment are most convenient, comfortable, safe and satisfying to prospective residents. A thorough understanding of residential mobility behaviour would consequently improve an appreciation of the residents' future housing needs and requirements. More importantly, this situation would underline the implications of relevant housing policy measures in the urban areas that give an advantage to residential mobility trends.

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