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FACTORS INFLUENCING OLDER PERSONS' RESIDENTIAL SATISFACTION IN BIG AND DENSELY POPULATED CITIES IN ASIA: A CASE STUDY IN HONG KONG

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Abstract

Many different "domains" of older persons' living environments potentially influence their residential satisfaction and thereby their well-being. Factors that might impact on older persons' residential satisfaction were explored in a busy Asian city, Hong Kong, in terms of a number of "domains" with elements: the Structural domain (interior and exterior dwelling characteristics, security concerns), the informal domain (informal social support including family, friends, and neighbours) and the formal domain (social services and community facilities) around or near the neighbourhood. Face-to-face interviews were conducted with a random sample 518 Hong Kong residents aged 60 and over, who lived in various housing arrangements including private/public and new/old housing establishments. Hierarchical regression analysis models revealed that the structural domain had the strongest tie with residential satisfaction. Formal and informal types of support for older persons' needs were generally unrelated to residential satisfaction. Further investigations showed that all three elements of the structural domain contributed unique variance to residential satisfaction. Satisfaction with community facilities, an element of the formal domain, was related to residential satisfaction even when variations from other domains were accounted for. When all the three domains were simultaneously analysed for their contributions to residential satisfaction, all of the elements of the structural domain and the community facilities element of the formal domain contributed to unique variance. The implications of the findings for policy makers in designing home settings for older persons in Hong Kong and some other Asian cities are discussed.

Background

Housing has been described as "the single-most important element in the life of an older person, aside from his or her spouse or significant other" (Kart and Kinney, 2001: p. 425). This can in part be attributed to the fact that older persons generally have more restricted activity spaces and they tend to interact more with their home and immediate local environments than do most people in younger age groups (Phillips & Yeh, 1999). Residential satisfaction and psychological well-being are known to be closely related and psychological well-being has been found to be an important

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factor for successful ageing. Therefore, it seems very sensible to investigate the predictors of residential satisfaction among older persons, especially with a view to devising ways of improving overall conditions and hence well-being (Brown, 1995, 1997; Phillips & Yeh, 1999; Siu & Phillips, 2002). A challenge is provided in this, however, as residential satisfaction is a complex and multi-faceted construct that includes all "actual things and ongoing events" (Leff, 1978: p. 112). When used in studies of homes and their localities, residential satisfaction is generally defined as individuals' appraisals of the conditions of their residential environment, in relation to their needs, expectations and achievements (Amerigo & Aragones, 1997; Gentile, 1991). Empirically, many studies have reported that housing features also exert an impact on residential satisfaction in urban environments including factors such as the quality of lifts, lighting, ventilation, quality of pavements, availability and adequacy of nearby open and green spaces, and residential and community crowding (Gomez-Jacinto & Hombrados-Mendieta, 2002; Kaplan, 1985; Levy-Leboyer & Ratiu, 1993; Perez, Fernandez-Mayoralas, Fernandez, & Abuin, 2001; Siu, Phillips, Yeh, & Cheng, 2003). In addition to housing needs, infrastructure such as transport links (rail, buses, ferries, etc.) and community facilities (schools, banks, pharmacies, grocery stores, post offices, parks, police posts, etc.) are also now generally expected and planned in developed world cities and in many developing country cities too. When these services are absent or too distant for older persons to reach comfortably, it can have a serious impact on their ability to use them and hence their well-being (Phillips & Yeh, 1999). Furthermore, the residential area is not restricted to the home but often also extends to the surrounding environment (or neighbourhood) and the people who live there (family members, neighbours). Indeed, older persons' experience with their neighbourhood and neighbours may be just as important as the home itself (Bond, 1993; Golant, 1984). Similar observations have been made by Kart and Kinney (2001) who suggest that the broader living environment in which the housing unit is located should be considered by gerontologists. The main elements of this living environment would include characteristics of the neighbourhood and community, such as the physical condition, location and proximity of support services, proximity to informal supports including family and friends, accessibility and usability of transportation, and security concerns. In summary, the main aspects of the living environments that may influence residential satisfaction of older persons can be categorised into three domains: (a) the structural domain which refers to the physical characteristics of the housing environment (such as stairs, lighting, parks) (b) the formal domain which includes community facilities and social services such as day care centres, clinics, transportations, and grocery stores and (c) the informal domain which refers to support offered by the older persons' relatives including family members, friends and neighbours.

Predictors of Residential Satisfaction: Structural Domain, Formal Domain and Informal Domain

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A general problem for researchers on residential topics has been to define where the physical boundaries for houses and neighbourhoods lie. This is because some aspects of the residential environment are social and mobile (such as family, friends, and neighbours) whilst others are relatively fixed (such as roads, houses, rail). It is useful to include not only private space-- that is, the interior dwelling conditions--but also semi-private "shared" common areas such as corridors, rifts and distant common public areas. It appears that someone's geographical boundaries which later come to influence their residential satisfaction are the result of the balance between the individuals' needs and availability of resources in the physical environment that satisfy the needs. As a result of this dynamic balance, some people identify residential satisfaction in terms of their micro-environment while others include more (or less) of their surrounding localities as the basis for evaluating their residential satisfaction. Some argue that residential satisfaction is evaluated, experienced and "consumed" by residents and its effects are temporal as opposed to continual (Bonaiuto, Aiello, Perugini, Bonnes, & Ercolani, 1999; Levy-Leboyer & Ratiu, 1993). One implication of this is that the areas of the environments in which older persons spend more time should have relatively more impact on residential satisfaction than those areas used less frequently (Levy-Leboyer & Ratiu, 1993). Important questions are: "What kind of residential environment is most supportive for older persons?" and "Are people influenced by subjective or objective factors?" An earlier study by O'Bryant (1982) investigated housing satisfaction of older people living in a large metropolitan area. It found that subjective factors, such as feelings of competence and emotional security, explained more of the variation in housing satisfaction than did objective factors such as demographic characteristics and objective housing conditions. However, a study using an individual-centered approach to categorize housing features/characteristics based on basic human needs (Carp & Christensen, 1986) found that objective environmental variables of housing and neighbourhood characteristics were closely related to residents' satisfaction with their living environment. With respect to the informal domain of residential satisfaction, it has been noted that the size of informal support networks and frequency of support are related to health and residential satisfaction measures (Antonucci & Akiyama, 1991). Apart from quantitative factors, the quality of support interactions (or subjective measures of social support) is also a good predictor of psychopathology and residential satisfaction (Chi & Chou, 2001; DuPertuis, Aldwin, & Bosse, 2001). In fact, subjective evaluation of support appears statistically more important than the actual support received for depression or psychological well-being (Antonucci, Fuhrer, & Dartigues, 1997; Chi & Chou, 2001; Oxam, Berkman, Kasl, Freeman, & Barrett, 1992). Multiple regression analysis has been used to show that attachment to the neighbourhood and relationships with neighbours explained the greatest amount of variance in residential satisfaction (Amerigo & Aragones, 1990). This seems to support the notion that residential satisfaction is tied to support sources that are nearby or more handy, often, the older persons' neighbours. In addition, residential satisfaction may also depend on one's attachment to the locality or neighbourhood and only when it is highly valued (Amerigo & Aragones, 1997; Fried, 1982). However, certain

households demonstrate less satisfaction in any residential context and certain dwelling and neighbourhood contexts consistently elicit dissatisfaction (Galster & Hesser, 1981). In short, different structural attributes and facilities affect older persons more than those who are younger. Empirically, the way in which people differ in terms of the things they use to evaluate residential satisfaction has been attributed to socio-economic factors and one's sense of belonging (or one's sense of neighbourhood) (Fried & Gleicher, 1961; Weenig, Schmidt, & Midden, 1990). While most older people are not, on a voluntary basis, bound to their homes, they nevertheless spend a substantial amount of their daily activities inside relatively small houses. This is certainly the case for many Hong Kong residences and those in similar densely settled Asian cities where land values are very high. Lack of ventilation, barrier-loaded kitchens and bathroom facilities, hazardous furniture and poor lighting are daily frustrations that can undermine residential satisfaction. On the other hand, many older persons enjoy socializing with their peers outside the home, in parks or recreation areas in close proximity to their residences. Perhaps because of these preferences, some people feel particularly attached to certain aspects of the dwelling environment while others are indifferent towards the same thing. This highlights the possible differential roles of the structural, formal and informal domains in predicting residential satisfaction among older persons.

Housing Policy for Older Persons in Hong Kong

In general, most governments in the developed world are now (willingly or reluctantly) confronting more responsively environmental issues related to older persons' welfare. In line with this growing concern and because of the widespread pressure to reduce social welfare expenditure, it is in the interest of most governments to assess the extent forms of formal (governmental) initiatives are successful in satisfying the needs of residents. It is also important to gauge the influences of governmental initiatives in relation to those provided by the private sectors or from informal means--such as support provided by older persons' children, relatives, friends and neighbours. Huge amounts of public and private finance are spent on both environmental upgrading and various forms of support for older persons. Because of this, the conceptualization of the residential environment into structural, formal, and informal domains can offer directions or guidelines as to where and how governments should address policies on the residential environment for older persons.

As in most Western countries, the Hong Kong government is also having to take much more notice of the housing needs and service aspirations of its older citizens. People in Hong Kong now have one of the longest life expectancies in the world and life expectancy at birth of Hong Kong's citizens had increased from 72.3 years for males and 78.5 years for females in 1981 to 78.4 and 84.6 for males and females by 2001 (Hong Kong Census and Statistics Department, 2001; Phillips, 2000;

Yeung & Chow, 2000). In terms of the geographical distribution of older population, Hong Kong has more older people living in the existing metropolitan districts than in other districts (Phillips & Yeh, 1999). The percentage of older persons in metropolitan areas was 1.3 percentage points higher than among the total population, whereas the relatively more rural areas in the New Territories was 2.5 percentage points lower (Yeh, 1999). The main concern is that the environments in the densely populated older metropolitan areas are poor and potentially hazardous to older persons, especially those in the low income group. Therefore, the degree and sources of housing satisfaction of older people in Hong Kong may be different from that found in developed Western countries.

Housing for all people in Hong Kong, especially for older persons who often lack the financial resources to upgrade or maintain their present dwellings, has been a source of great concern and expenditure for administrations for a number of years. Sir Murray MacLehose, a governor of Hong Kong between 1971 and 1982, and his successors, embarked on public housing initiatives for those (which also included older persons) who were unable to afford their own private housing. The housing conditions in earlier public housing estates dating from the mid-1950s arguably met the barest essential or basic needs of such people. However, over the years until the very recent, the government has been committed to constructing more public housing for all age groups who need it. Today, the standard of living in Hong Kong (in some ways) is approaching that in many large Western cities and the standard of today's public housing in Hong Kong is comparatively much better than that in initial estates. Public housing in Hong Kong is generally built in the form of fairly large estates and the initial ones established in the 1950s and 1960s were basic and catered mainly for a postwar influx of poor migrants from Mainland China. Public housing built in the 1980s and 1990s has become relatively more sophisticated and includes facilities such as green areas, security management, elevators that are accessible to the physically challenged, air-conditioned "wet markets" and a range of shopping creational services and facilities. Architectural designs with human ergonomics in mind have also been incorporated into recent public housing projects and specific housing types have been built catering for older persons in various states of health (Phillips & Yeh, 1999; Yeh, 1999). Some of the services now provided include day nursing care centres, meal delivery services and home cleaning services. The early initiatives mainly focused on building mass public housing. In recent years, they have expanded to upgrading of older private estates and blocks in the metropolitan areas with an important policy of urban redevelopment running alongside the provision of more peripheral new housing.

Many social changes have occurred in parallel with the urban development. Hong Kong, like many other Asian cities, has witnessed major changes in family structure which are probably the combined result of modern economic transformation, housing shortage, migration and the assumed erosion of filial piety (Asian especially Chinese family values). This suggests that formal services offered by the government and non-government organisations (NGOs) will be welcome in

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addition to informal support sources. However, it is also possible that the current middle-aged Chinese population may continue to take on their filial piety responsibilities even though they do not live with their parents or older relatives any more (Ng, Phillips, & Lee, 2002). Older persons without children seem to receive the poorest support, while older persons living with their children seem to receive the best support from adult children (Ng et al., 2002). In terms of size of support network, it appears that, the larger the support network, the more care the older person will receive (Chou & Chi, 2001). Perceived size of contact network with family members, relatives and neighbours has been significantly related to residential satisfaction (Phillips, Siu, Yeh, & Cheng, 2003).

The Present Study: Older Persons' Residential Satisfaction in Hong Kong

This current study was undertaken for a number of practical and policyrelated reasons, principally related to the government's initiative to encourage community care and, more recently, "ageing in place" (as opposed to institutionalisation) (Chow, 1992, 2000). The success of "ageing in place" often hinges on the extent to which residents are satisfied with the physical as well as the social environment in which they live in. For instance, the interior and exterior residential environment should be designed so as to pose the minimal amount of barriers or potential hazards to older persons' daily activities. Likewise, social services that offer to care for older persons' daily needs--such as day care nursing homes, home cleaning services and meals-onwheels--can lend assistance to older persons' families who may have been affected by the recent economic downturn.

This study investigates the three domains of the residential environment, which include aspects of the physical environment (interior and exterior), the formal care domain and the informal care domain. In the literature, there is relatively little information on the contribution of these environmental domains to older persons' residential satisfaction. Hence, one of the main goals of this study is to assess the degree to which the various domains are related to residential satisfaction and also whether this differs for older persons who live in public or private housing.

It is suggested that, since older persons in public rental housing do not own their homes or have a financial interest in their housing estates, they are likely to derive residential satisfaction using the interior home environment (as oppose to the exterior environments). Conversely, residents in private estates with a vested interest are more likely to identify with the wider environment and facilities and services around them because, in the Hong Kong setting, they are perceived to be the shared property of the block owners. Another factor is that the exterior environments in older public housing are often dilapidated and residents may not find these domains to be a source of satisfaction. The study also explores whether the residents of new towns (as oppose to those living in old urban areas) weight their exterior environments in addition to the interior environment.

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The research focused on a number of questions: First, what are the relationships between older persons' levels of satisfaction with the three domains of the dwelling environment and their residential satisfaction? In other words, the researchers wished to find out to what extent the effectiveness of specific governmental and related initiatives meet residents' needs. Second, what kind of residential environment is most supportive for older persons' residential satisfaction in meeting their needs? Past surveys have seldom examined such aspects of the environment from an individual needs perspective. Third, will there be differential impacts of the interior environment and the exterior environment on older persons' satisfaction with their residential settings? Fourth, are there any differences in levels of residential satisfaction between older persons living in old urban areas and new towns? Fifth, are there any differences in levels of residential satisfaction between older persons living in public housing and private housing?

Finally, as noted earlier, the researchers also aimed to provide policy and practical information for remedial work relating to urban design, housing policy and related strategies. Ultimately, it was hoped that the study will provide assistance to planners and designers who contribute to the developments of large, densely settled Asian urban settlements such as found in Hong Kong. In a move to help achieve the overall last aim, an advisory committee for the project was established, meeting at periods through the project, comprising senior members of relevant government departments, agencies, NGOs and academia.

Methods

Participants and Procedures

In Hong Kong, there are no general population lists based on age from which to draw a sample and, in addition, the research needed to know the environmental characteristics of the residential areas. Therefore, respondents were identified by a quota areal sampling method in which areas rather than lists form the sampling frame (Yeh, 1999). The research wanted to find the views of older persons themselves, so face-to-face interviews were needed and an areal sampling method helps to concentrate interviewer efforts into areas of defined social and environmental characteristics where target respondents are most likely to be found. Initially, four general field study areas (two in old urban areas and two in new towns L) with high concentrations of lowincome residents, overcrowded households and high concentrations of older persons were identified using a geographical information system (GIS). Second, within each of the areas, four types of housing sub-areas were identified, with more specific characteristics so that the required sample of older respondents could be more easily selected: old public housing, new public housing, old private housing and new private housing. Thus, for each of the four areas there were four housing sub-districts yielding a classification of 16 different research subareas. This type of

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areal sampling respondents therefore provided a coherent geographical sampling framework within which to locate interview respondents (see Table 1). The research sub-areas were comparable in terms of known environment factors and they also had known proportion of older residents to enable interviewee selection. The study restricted itself principally to the lower income groups who today comprise by far the majority of Hong Kong's older population and for whom there is less choice of where and how to live.

The initial stage used the 2001 Hong Kong Population Census 2 as the source of socio-economic data, from which large street blocks of the whole of Hong Kong were classified and mapped with the GIS software, ArcView, based on three criteria--low income, overcrowdedness and elderly persons. Large street blocks with high concentrations of low-income households 3 were defined as those with percentages of monthly domestic household incomes of less than HK$9,999 (US$1,280) that are higher than the Hong Kong's average percentage of 24.03%. Overcrowdedness involved identifying large street blocks with percentages of domestic households with main tenants, sub-tenants and cotenants higher than the Hong Kong average of 3.58%. Large street blocks with high concentrations of elderly population were defined as those having percentages of population aged over 60 years old (the official retirement age in Hong Kong) higher than the Hong Kong average of 11.13%. The GIS analysis identified a range of areas with these characteristics from which the research team was able to enabled four clusters of such areas, two in the old urban areas (Sham Shui Po and Kwun Tong) and two in the new towns (Tuen Mun and Tai Po), with elderly services nearby. The selected areas thus represented overcrowded, low income locations, with a high concentration elderly population (Table 1).

Table 1

The quota areal sampling method using a GIS

	Old Urban Areas		**New Town**	
	General Field Area 1	**General Field Area 2**	**General Field Area 3**	**General Field Area 4**
Old Public Housing	Sub-Area 1	Sub-Area 2	Sub-Area 3	Sub-Area 4
New Public Housing	Sub-Area 5	Sub-Area 6	Sub-Area 7	Sub-Area 8
Old Private Housing	Sub-Area 9	Sub-Area 10	Sub-Area 11	Sub-Area 12
New Private Housing	Sub-Area 13	Sub-Area 14	Sub-Area 15	Sub-Area 16

General Field Area 1—"**Sham Shui Po**"; General Field Area 2—"**Kwun Tong**"; General Field Area 3—"**Tuen Mun**"; General Field Area 4—"**Tai Po**"

The second stage of the areal sampling involved the identification within each of the four selected

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general areas of four more detailed and specific types of housing areas which became the actual survey areas and were areas of old public housing, new public housing, old private housing and new private housing. The criteria for detailed classification were as follows. Buildings over 30 years old were classified as "old housing areas" and those aged from 5 to 10 years old were classified as "new housing areas". Buildings under 5 years old were not used in the study as it was felt that residents might still be experiencing adjustment which could distort respondents' perceptions of the environment. The researchers reasoned that a neighbourhood of five years or older would be more settled or established. Public housing and private housing areas were identified within each of the four selected general areas. The overlay of public and private housing areas with building age enabled the framework to identify old and new public housing and old and new private housing areas, giving a total of 16 different research sub-areas within the four selected general field areas.

Detailed maps showing the outline of street blocks/housing estates were prepared for each of the 16 selected research areas for interviewers. They were trained to conduct face-to-face interviews with about 30 older respondents selected by a random sampling method, as follows. When a building was selected, the interviewers would select the residence by choosing the second apartment or unit on each of the 5th, 10th, 15th, 20th floors, etc. If the selected unit did not have a target respondent (age 60 or above) or no-one responded, the interviewers would proceed next door. To ensure the data reflected an even distribution of residents living within a given region, each building or living block within a region was allowed two successfully completed participants. Once the quota of was filled, the interviewers moved on to another building within the selected region. An overall response rate of 59% was achieved, a reasonable rate given the need for detailed interviews with older respondents. The overall sample comprised 518 respondents as summarized in Table 2.

Measures

The Structural Domain

Assessment of the living environment consisted of twelve housing or dwelling characteristics (lighting, crowdedness, temperature, hygiene, size, privacy, ventilation, kitchen, toilet/bathroom facilities, fire protection devices such as sprinkler, security devices, planning for elders such as level of baths, emergency alarm system), twelve neighbourhoods characteristics: lighting in corridor/lobby/public space, stairs, lift/escalator, recreational area, green area, road sign, pedestrian/flyover/subway, road traffic light/alarm, maintenance/ repair, management of block/estate, hygiene of block/estate, air/noise pollution. These sub-domains were chosen based on the work of Siu and Wong (2001) and Loo (2000). A principal component analysis revealed that all of the items (with the exception of one) could be represented by three general dimensions, which

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were: satisfaction with inner dwelling conditions, outer dwelling conditions, and security of the surroundings. For a full explanation of item selection procedures, please refer to Phillips, Siu, Yeh, and Cheng (2004).

Table 2

The respondents and study areas

Demographic Variables	Sub-Categories	Frequency	Percentage (%)
Districts	Old Urban Areas	272	52.5
	New Towns	246	47.5
Housing Type	Public Housing	272	52.5
	Private Housing	246	47.5
Gender	Male	224	43.2
	Female	294	56.8
Age of Interviewees			
	60-64	85	16.4
	65-69	107	20.7
	70-74	134	25.9
	75-79	116	22.4
	80+	74	14.3
Marital Status	Married with a spouse in HK	300	57.9
	Married with a spouse in China/elsewhere	8	1.5
	Cohabitant	6	1.2
	Widowed	166	32.0
	Divorced/ separated	6	1.2
	Single/never married	13	2.5
Education	Illiterate	144	27.8
	Very basic/ village school	102	19.7
	Completed primary	171	33.0
	Junior secondary	51	9.8
	Senior secondary	17	3.3
	Professional training	4	0.8
	University or above	14	2.7
Living Arrangement			
	Living alone	83	16.0
	Living with spouse	136	26.3
	Living with closed relatives	175	33.8
	Living with stranger	4	0.8
	Others:	4	0.8
Monthly income (HKD)			
	$0-1499	69	13.3
	$1500-2999	175	33.8
	$3000-4499	126	24.3
	$4500-5999	62	12.0
	$6000+	54	10.4

Note that the total may not sum to 518 because there were non-responses for some of the categories.

The Formal Domain

The formal support domain was represented by two major compound variables: first, social

services (community agencies and home care sources such as Social Centres and Day Care Centres for the Elderly, Social Welfare Department Family Service Centres, and medical services such as Western/Chinese clinics, hospitals) and, secondly, community facilities (public transport services parks, banks, market/groceries, supermarkets, shopping centre/commercial complexes). These measures were also chosen based on Loo's (2000) work on residential satisfaction. The items measure the extent to which these two aspects of formal services are satisfactory to users. A 5-point Likert scale (scaled "1" for "Very Dissatisfied" to "5" for "Very Satisfied") provided the measure of satisfaction.

The Informal Domain

Participants' satisfaction with interactions from each source of informal support (family members, relatives, friends and neighbours) was also assessed using a 5-point Likert scale (scaled "1" for "Very Dissatisfied" to "5" for "Very Satisfied"). This provided a measure of the self-evaluated quality of interaction between caregivers and the older person.

Residential Satisfaction

Residential Satisfaction was assessed by levels of satisfaction with livability in the dwelling, block/estate and district. Each item was scored relating to use ranging from very satisfied (5) to very dissatisfied (1).

Demographic Variables

A range of demographic and other variables were included so that the measures were not confined to any single demographic influence (Brown, 1997; Burnette & Mui, 1994, 1996). They included districts (old urban areas vs. new towns), housing types (public vs. private housing), age, marital status, education, living arrangement, income, life stressors, activities of daily living (ADL), and self-report health status which were used as controlling variables.

Analysis

Demographic variables were included in the regression model since it is frequently asserted that demographic and personality characteristics of families combine to explain residential satisfaction (Bruin & Cook, 1997). To investigate statistically the relative importance of each variable, two regression models were under analyses. In the first, each domain was tested for its unique contribution in relation to other domains. This was achieved by holding the demographic variables and the two non-testing domains (formal and informal) constant while entering the testing domain (structural domain) in the final step. In the second model, all of the sub-domains from each domain were allowed to compete for variance. That is, all of the variables belonging to each domain were entered and a stepwise regression procedure was then performed. The former model should allow the research to establish the importance of each domain independently with respect

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to other domains. The second model should provide information on which aspects exhibit a relatively greater influence compared to other specific element from the same or different domain. In a separate analysis that examines the components of residential satisfaction for public versus private housing (or new towns vs. old urban areas), a similar regression was conducted, the difference being that each model was based on participants who live in their respective sub-group. In other words, one regression model was generated for the public housing sample and another for the private housing sample and for new towns and old urban areas.

Results

Residential satisfaction was correlated to satisfaction with a number of variables: community facilities, informal support from family and relatives, interior dwelling environment, exterior environment to the dwelling, and security concerns (Table 3). Table 3 also shows that, compared to the formal and informal support domains, the structural domain (aspects of the environment concerning interior, exterior and security concerns) was much more strongly correlated with residential satisfaction.

In the hierarchical regression models, demographic features accounted for 4% of the total variance. The results from the first regression model indicate that the structural domain (that is, aspects related to interior dwelling environment, exterior dwelling environment, and security concerns) was significantly contributing to the variance with respect to residential satisfaction. However, the formal and informal support domains were not generally significant although the formal domain was marginally significant at the low level of $p < 0.1$ (Tables 4 and 5).

In the stepwise regression model, in which elements from each domain were allowed to compete for variance, the results indicated that; 1) the interior dwelling environment, 2) the exterior dwelling environment, 3) the security concerns and 4) community facilities exerted significant influences on residential satisfaction (Table 6).

Residential Satisfaction in Public versus Private Housing

Using a similar approach to the above, elements of the three domains were all subsequently entered in the stepwise regression model. As predicted, older persons who lived in public housing considered only the quality of the interior environment in their evaluation of residential satisfaction. By contrast, older people who lived in private estates considered both the interior and exterior environments (Table 7). This finding suggests that older people who lived in public housing tend to confine their evaluations to the immediate aspects of their environment (namely, their own living quarters). They heavily based their evaluation on the interior since the standardized beta value was very high and significant. This was different from older people living

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in private estates whose sources of residential satisfaction were more extensive. Unlike people in public housing, private estate residents seemed to allocate their evaluations to incorporate both interior and exterior aspects of the environment.

Table 3

Correlations between residential satisfaction and satisfaction with formal, informal and structural domains.

	Mean (S.D)	Residential Satisfaction	Community Facilities	Social Service	Informal support from family & relatives	Informal support from friends & neighbours	Interior Environment	Exterior Environment	Security Concerns
Residential Satisfaction	3.61 (0.56)	0.76							
Community Facilities	4.31 (0.60)	0.09*	0.60						
Social Service	5.03 (0.71)	0.03	0.27***	0.43					
Informal support from family & relatives	4.56 (0.93)	0.10*	0.12**	0.16***	0.83				
Informal support from friends & neighbours	4.63 (1.02)	0.06	0.15***	0.23***	0.46***	0.88			
Interior Environment	3.42 (0.57)	0.58***	0.03	0.06	0.09*	0.14***	0.78		
Exterior Environment	3.44 (0.51)	0.45***	-0.02	0.08	0.14**	0.22***	0.54***	0.76	
Security Concerns	3.41 (0.61)	0.40***	-0.14**	-0.05	0.10*	0.08	0.53***	0.48***	0.72

Diagonal cells contain Cronbach alpha coefficient (in brackets)

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

*** Correlation is significant at the 0.001 level (2-tailed).

Table 4

Hierarchical Regression: Regressing residential satisfaction on environmental domains

		Predictors	Adjusted R^2	ΔF	d.f.	p
Structural Domain						
	Step 1	Demographics	.04	1.53	32, 434	.03
	Step 2	Demographics, Formal and Informal Domains	.04	1.72	4, 430	n.s.
	Step 3	Demographics, Formal, Informal and Structural Domains	.38	77.95	3, 427	.0005
Formal Domain						
	Step 1	Demographics	.04	1.53	32, 434	.03
	Step 2	Demographics, Structural and Informal Domains	.37	47.58	5, 429	.0005
	Step 3	Demographics, Structural, Informal, and Formal Domains	.38	2.46	2, 427	n.s.
Informal Domain						
	Step 1	Demographics	.04	1.53	32, 434	.03
	Step 2	Demographics, Structural and Formal Domains	.37	47.82	5, 429	.0005
	Step 3	Demographics, Structural, Formal, and Informal Domains	.38	2.07	2, 427	.09

Notes: Demographics = Gender, Age, Marital Status, Education, Income, Housing Type, District, Living Arrangement, and Self-Rated Health

Table 5

Regression coefficients of environmental domains for the prediction of residential satisfaction

Criteria	Predictor category	Predictors	B	SE (B)	β	p
Residential Satisfaction (RS)						
	Structural Domain	Interior Environment	2.77	0.33	0.41	0.00
		Exterior Environment	1.48	0.37	0.20	0.00
		Security Concerns	0.74	0.30	0.12	0.01
	Formal Domain	Community Facilities	0.63	0.28	0.10	0.03
		Social Service	-0.13	0.22	-0.02	0.55
	Informal Domain	Supports from family & relatives	0.36	0.19	0.09	0.06
		Supports from friends & neighbors	-0.23	0.19	-0.06	0.21

Table 6

Stepwise procedure: Regression coefficients for the prediction of residential satisfaction

Criteria	Regression: Stepwise steps	Predictors	Adjusted R^2	ΔF	d.f.	B	SE (B)	β	p
Residential Satisfaction (RS)									
	Step 1	Demographics	.04	1.53	32, 434	n.a.	n.a.	n.a.	n.a.
	Step 2	Interior Environment	.34	196.49	1, 433	2.76	0.33	0.41	.0005
	Step 3	Exterior Environment	.36	19.86	1, 432	1.42	0.37	0.19	.0005
	Step 4	Security Concerns	.37	4.64	1, 431	0.79	0.30	0.13	.01
	Step 5	Community Facilities	.37	5.31	1, 430	0.62	0.27	0.09	.02

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Table 7

Predictors of residential satisfaction for different housing types and districts

Criteria	Selected group	Regression: Stepwise steps	Predictors	Adjusted R^2	ΔF	d.f.	B	SE (B)	β	p
Residential Satisfaction (RS)										
	Public Housing	Step 1	Demographics	.01	1.09	31, 190	n.a.	n.a.	n.a.	n.a.
		Step 2	Interior Environment	.40	125.93	1, 189	4.27	.38	.67	.0005
	Private Housing	Step 1	Demographics	.05	1.42	30, 214	n.a.	n.a.	n.a.	n.a.
		Step 2	Interior Environment	.28	68.01	1, 213	2.32	.48	.33	.0005
		Step 3	Exterior Environment	.33	18.13	1, 212	2.29	.54	.30	.0005
Residential Satisfaction (RS)	Old Urban Areas	Step 1	Demographics	.00	0.98	30, 202	n.a.	n.a.	n.a.	n.a.
		Step 2	Interior Environment	.37	120.09	1, 201	3.52	0.44	0.54	.0005
		Step 3	Exterior Environment	.38	4.03	1, 200	1.03	0.51	0.14	.05
	New Towns	Step 1	Demographics	.06	1.49	30, 203	n.a.	n.a.	n.a.	n.a.
		Step 2	Interior Environment	.24	48.26	1, 202	2.03	.50	.27	.0005
		Step 3	Exterior Environment	.31	21.54	1, 201	2.46	.60	.27	.0005
		Step 4	Security Concerns	.32	5.37	1, 200	.93	.40	.16	.02

Notes: Demographics = Gender, Age, Marital Status, Education, Income, Housing Type, District, Living Arrangement, and Self-Rated Health

Compared to residents living in old urban areas, residential satisfaction for older persons in new towns was closely tied to their evaluations on both the interior and exterior environments as well as aspects related to security concerns (Table 7). Perhaps surprisingly, residents in old urban areas did not focus on aspects related to security concerns. Instead, they focused on the interior and the exterior environments. Residents in relatively newer dwellings distributed their evaluations across aspects related to all three aspects, interior, exterior and security. This is quite unlike the case for residents in relatively older dwellings, where most of the evaluations were heavily based on the

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interior environment.

Discussion

One of the purposes of the study was to assess the degree to which various domains of the housing environment are related to residential satisfaction of older persons in Hong Kong. In light of the findings, it appears that aspects of the living environment related to the structural domain--the interior, the exterior and security--were most important to older persons irrespective of the status of their living environment. Furthermore, community facilities (a subdomain of the formal domain) played a significant part in affecting older people's residential satisfaction. These results were obtained when the effects of housing types (public versus private) and housing locations (new towns versus old urban areas) were controlled for in the regression equations.

The results of the study were consistent with the argument that residential satisfaction is evaluated, experienced and "consumed" by residents and its effects are temporal as opposed to continual (e.g., Bonaiuto et al., 1999; LevyLeboyer & Ratiu, 1993). The results corroborate past studies that report the effects of social status on perceptions of neighbourhood (such as Weenig et al., 1990). It could be inferred that public housing residents (older residents in this case) have somewhat detached themselves from their exterior environment, most likely because their conditions are not very salubrious. It could be that older people in these older environments do not feel that they are part of the community because it was never their property in the first place, perhaps indicating a feeling of lack of control. This may suggest that the quality and ownership of the environment could affect how and what criteria residents use in deriving residential satisfaction. Further evidence that supported this notion was found in the regression model, which examined the differences between residents in new versus old urban areas. As expected, people in older urban areas used relatively "less" of their environment for sources of residential satisfaction compared to those in newer areas. Furthermore, again as expected, people in newer areas invoked many aspects of interior and exterior environment and security concerns whereas people in older areas tended to exclude the security concern aspects of their environment. A possible explanation is that people in older areas have already resolved their concerns for safety since they have been living in relatively less secure places for a long time. It follows that older people may perceived their dwelling environment as safe for them despite the comparatively or assumed higher crime rates associated with some older areas. However, as Hong Kong is relatively a very safe Asian city, this aspect may be of less significance than it could be in other settings.

Some Unique Findings from the Study

When the three domains of the living environment (structural, formal, and informal) are compared with respect to each other, the informal domain played only a minor and insignificant role in older

persons' residential satisfaction. This contrasts with the findings of some other studies. For instance, Ng et al. (2002) and Krause (2001) have noted that friends and neighbours as social support are considered as very important in the lives of the older persons. Specifically, filial piety (family values) has traditionally been highly valued in collectivist Chinese societies. Putting the results into a broader context, the influence of the interior environment on residential environment was overwhelming, as it accounted for at least 28% of the total variance while the remaining domains contributed to a mere 4% of the total variance. Demographic variables accounted for 10% of the total variance. The results support the notion that residential satisfaction is affected most strongly by one's immediate perceived environment.

When the sample population was analysed according to district (new towns versus old urban areas) or housing types (public versus private), it was apparent that older people who lived in public housing shielded or perhaps even detached themselves from the exterior environment. Because of this, only their interior environment was used in their evaluation of dwelling satisfaction. Similarly, those who lived in new towns paid more attention to wider aspects of the environment and security concerns whereas respondents in old urban areas did not consider security concerns as important. Instead, they were concerned more about the interior and the exterior living conditions.

Overall, it is perhaps surprising to find there is less concern about facilities or proximity to social services or the need for security among the older persons in Hong Kong. These are features that one might expect to be of concern in major cities in the Western world. Instead, it is the interior environment which accounts more for their evaluation of the residential environment and the impacts are even more profound among older residents living in old urban areas and in public housing in Hong Kong.

These findings are important for policy makers as they indicate the areas that could repay investment and to which their attention should be directed. In other words, resources could be allocated to improve aspects such as the interior of homes and those aspects of the exterior environment identified according to the needs of older persons resides in specific residential areas. Given that the interior environment accounts for the majority of the total variance (that is, it is highly influential in shaping attitudes), it is important to invest more in structures other than those related to the interior environment, even though interior design may not be a priority for government departments. What could be valuable for policy makers is that older persons apparently learn to "attach" or "detach" certain aspects of the environment, which are used to evaluate their satisfaction with their residency. The choice to attach or detach from their residential environment appears to depend on the extent to which they can identify with it. It seems likely that positive identification or negative detachment may be due to the quality of these

environmental aspects. So, residents are not merely passive consumers of environmental factors. Instead, they take the initiative to reach an equilibrium regarding conflicts they encounter daily in their environment. This is demonstrated insofar as that the concerns of residents in new towns were different from those of residents in old urban areas. In the latter, for example, concerns about safety are surprisingly not tied to physical aspects of the environment.

Policy makers, especially those involved in public housing design and maintenance for older persons, clearly also need to pay careful attention to improving the quality of facilities in the community. The fact that this variable was playing only a minor role for many respondents could be explained by several reasons. For instance, certain facilities could be lacking in the first place or located too far away for older persons to reach conveniently. They are thus "discounted" by residents. By contrast, people who use facilities frequently may develop stringent expectations, which are difficult to meet. Those who used facilities more have experience of the quality of service and they therefore become more habituated to the services on offer. This is perhaps one of the main deficiencies of using "satisfaction-based" measures, since people's expectations and frequency of use are likely to be interrelated and are often not taken into account.

Previous surveys have seldom examined the effects that different aspects of dwelling environments have on older persons' residential satisfaction, so the present study can contribute to the development of theories of ageing and environment in developed and developing countries. Objectively, as found in the American Housing Survey (1997), older persons in some developed Western countries enjoy a relatively better living environment and have a higher residential satisfaction than most of those in Hong Kong, both in terms of space and quality of physical environmental conditions (American Housing Survey, 1997). However, this can be re-interpreted as there are just perhaps different sources of satisfaction or dissatisfaction amongst older persons in the different societies. For instance, some American older people, if "overhoused", living in housing too large for their needs, might be worried about their financial ability to meet housing expenses. This could then become a stressor coming from their living environment. It seems that other developing countries in Asia, in particular large cities in the People's Republic of China (PRC), could learn from Hong Kong's experience of older people living in the old urban areas and the new towns. Recently, there have been a plethora urban renewal projects in many mega-cities in the PRC, such as Shanghai and Beijing, due to rapid development of modernization of infrastructure and housing projects (not the least of which stems from urban redevelopment associated with the 2008 Olympic Games in Beijing). The living environments of many older persons in such cities will be affected to a certain extent. Therefore, the differential needs of older persons in their interior and exterior environments should be taken into account in the planning design and construction of appropriate housing for older citizens.

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Future Refinements

The present project has explored an understudied research area and had the merit of an areal stratified random sample, but it nevertheless has certain limitations. For example, as it assessed the inter-correlations between one measure of overall residential satisfaction against other "satisfaction-based" measures (various environmental and social domains), the results could statistically be affected by common method variance. Future research could be enhanced by taking into account frequency measures for some of the domains used. For instance, the frequency of visits or use of the various social facilities such as day-care centres should also be examined. It may be expected that differences in use of these services might have influenced levels of satisfaction with them but the detailed recording of such information can be very time consuming especially in large scale survey. In addition, more refined measures of accessibility such as the precise times, physical distances and costs involved in reaching various domain aspects (such as home, post offices, supermarkets, banks and clinics) could be plotted to investigate their relationship with residential satisfaction. The assumption was made that the perceived accessibility of these domain aspects may affect the results of the satisfaction scores. It was also a challenge to derive qualitative measures for some aspects of the structural domain. Perhaps more detailed measures such as the number of elevators (rather than simple presence or absence) as well as various physical measures relating to environmental impact factors (such as wind speed, temperature and humidity) could be incorporated although the complexity of asking such details to some older participants must be acknowledged.

As in many empirical studies, this research can be criticised on the basis of its initial classifications, in this case, the division of domains into formal, informal and structural domains. These categories were not firmly formulated on any strong theoretical grounds. Instead, the distinction was motivated by the need to assess the impact of various contributors (such as government, NGOs and the private sector) on older persons' well-being. Another potential criticism relates to whether the comparisons are meaningful and justifiable especially when the domains are so different from each other. For instance, some domains (or aspects within domains) are "consumed" (or need to be used) more frequently than others, while some are used only temporarily or only at critical moments. Additionally, some domains (or aspects within domain) are subject to greater autonomous choice and control by the participant. Finally, the ways in which satisfaction was derived may arise differently across the different domains. All of these qualitative differences mean interpretations of the comparisons should be made with caution yet they do add to the opportunities for future refinement and development of the methodology.

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Notes

1. The two old urban areas were Sham Shui Po and Kwun Tong and the two new towns were Tuen Mun and Tai Po.
2. The census data were stored on CD-ROM for analysis at the Centre of Urban Planning and Environmental Management, The University of Hong Kong.
3. According to the Hong Kong Census 2001, the average monthly income from main employment of the working population was just under HKD$10,000 (Hong Kong Census and Statistics Department, 2001).

References

American Housing Survey for the United States. (1997). Retrieved November 30, 2003, from http:// www.census.govlhhes/www/housing/ahslahs97/ahs97.html.

Amerigo, M. & Aragones, J.I. (1990). Residential satisfaction in council housing. Journal of Environmental Psychology, 10, 313-325.

Amerigo, M. & Aragones, J.I. (1997). A theoretical and methodological approach to the study of residential satisfaction. Journal of Environmental Psychology, 17, 47-57.

Antonucci, T.C. & Akiyama, H. (1991). Social relationship and aging well. Generations, 15, 39-44.

Antonucci, T.C., Fuhrer, R., & Dartigues, J.F. (1997). Social relations and depressive symptomatology in a sample of community-dwelling French older adults. Psychology and Aging, 12, 189-195.

Bonaiuto, M., Aiello, A., Perugini, M., Bonnes, M., & Ercolani, A.P. (1999). Multidimensional perception of residential environment quality and neighbourhood attachment in the urban environment. Journal of Environmental Psychology, 19, 331-352.

Bond, J. (1993). Living arrangements of elderly people. In J. Bond, P. Coleman and S. Peace (Eds.), Ageing in society: An introduction to social gerontology (pp. 200-225). London, UK: Sage.

Brown, V. (1995). The effects of poverty environments on elders' subjective well-being: A conceptual model. The Gerontologist, 35, 541-548.

Brown, V. (1997). The elderly in poor urban neighbourhoods. New York: Garland Publishing Inc.

Bruin, M.J. & Cook, C.C. (1997). Understanding constraints and residential satisfaction among lowincome single-parent families. Environment and Behavior, 29, 532-553.

Burnette, D. & Mui, A.C. (1994). Determinants of self-reported depressive symptoms by frail

elderly persons living alone. Journal of Gerontological Social Work, 22, 3-19.

Burnette, D. & Mui, A.C. (1996). Psychological well-being among three successive cohorts of older American women who lived alone. Journal of Women and Aging, 8, 63-80.

Carp, F.M. & Christensen, D.L. (1986). Technical environmental assessment predictors of residential satisfaction: A study of elderly women living alone. Research on Aging, 8, 269-287.

Chi, I. & Chou, K.L. (2001). Social support and depression among elderly Chinese people in Hong Kong. International Journal of Aging and Human Development, 52, 231-252.

Chou, K.E. & Chi, I. (2001). Social support exchange among elderly Chinese people and their family members in Hong Kong. International Journal of Aging and Human Development, 53, 329-346.

Chow, N.W.S. (1992). Hong Kong: Community Care for Elderly People. In D.R. Phillips (Ed.), Ageing in East and Southeast Asia (pp. 65-76). London, UK: Edward Arnold.

Chow, N.W.S. (2000). Ageing in Hong Kong. In D.R. Phillips (Ed.), Ageing in the Asia-Pacific region (pp. 158-173). London, UK: Routledge.

DuPertuis, L.L., Aldwin, C.M., & Bosse, R. (2001). Does the source of support matter for different health outcomes? Findings from the Normative Aging Study. Journal of Aging and Health, 13, 494-510.

Fried, M. (1982). Residential attachment: Sources of residential and community satisfaction. Journal of Social Issues, 38, 107-119.

Fried, M. & Gleicher, P. (1961). Some sources of residential satisfaction in an urban slum. Journal of American Institute of Planners, 27, 305-315.

Galster, G.C., & Hesser, G.W. (1981). Residential satisfaction: Compositional and contextual correlates. Environment and Behavior, 13, 735-758.

Gentile, K.M. (1991). A review of the literature on interventions and quality of life in the frail elderly. In J.E. Birren, J.E. Lubben, J.C. Rowe and D.E. Deutchman (Eds.), The concept and measurement of quality of life in the frail elderly (pp. 75-86). San Diego, CA: Academic Press.

Golant, S.M. (1984). A place to grow old: The meaning of environment in old age. New York: Columbia University Press.

Gomez-Jacinto, L. & Hombrados-Mendieta, I. (2002). Multiple effects of community and household crowding. Journal of Environmental Psychology, 22, 233-246.

Hong Kong Census and Statistics Department. (2001). Hong Kong population projections: 2001-2016. Hong Kong: Government Printer.

Kaplan, R. (1985). Nature at the doorstep: Residential satisfaction and the nearby environment. Journal of Architectural and Planning Research, 2, 115-127.

Kart, C.S. & Kinney, J.M. (2001). The realities of aging: An introduction to gerontology (6th Ed.). Needham Heights, MA: AUyn & Bacon.

Krause, N. (2001). Social support. In R.H. Binstock & L.K. George (Eds.), Handbook of aging and the social sciences (pp. 272-294). San Diego, CA: Academic Press.

Leff, H. (1978). Experience, environment, and human potentials. New York: Oxford University Press.

Levy-Leboyer, C. & Ratiu, E. (1993). The need for space and residential satisfaction. Architecture and Comportement/ Architecture and Behaviour, 9, 475-490.

Loo, W.M. (2000). Living environment and residential satisfaction of older persons in Hong Kong: A comparative study between Sha Tin New Town and Wan Chai Old Urban Area, Unpublished M.Phil. Thesis, Hong Kong: Lingnan University.

Ng, A.C.Y., Phillips, D.R., & Lee, W.K.M. (2002). Persistence and challenges to filial piety and informal support of older persons in a modem Chinese society: A case study in Tuen Mun, Hong Kong. Journal of Aging Studies, 16, 1-20.

O'Bryant, S.L. (1982). The value of home to older persons: Relationship to housing satisfaction. Research in Aging, 4, 349-363.

Oxam, T.C., Berkman, L.F., Kasl, S., Freeman, D.H., & Barrett, J. (1992). Social support and depressive symptoms in the elderly. American Journal of Epidemiology, 135, 356-368.

Perez, F.R., Fernandez-Mayoralas, G., Fernandez, E.P.R., & Abuin, J.M.R. (2001). Ageing in place: Predictors of the residential satisfaction of elderly. Social Indicator Research, 54, 173-208.

Phillips, D.R. (2000). Ageing in the Asia-Pacific Region. London, UK: Routledge.

Phillips, D.R., Siu, O.L., Yeh, A.G.O., & Cheng, K.H.C. (2003). Social support and its influence on psychological well-being and residential satisfaction. Unpublished manuscript, Hong Kong: Lingnan University.

Phillips, D.R., Siu, O.L., Yeh, A.G.O., & Cheng, K.H.C. (2004). The impacts of dwelling conditions on older persons' psychological well-being in Hong Kong: The mediating role of residential satisfaction. Social Science and Medicine (in press).

Phillips, D.R. & Yeb, A.G.O. (1999). The environment and elderly people--An emerging social and planning issue in Hong Kong. In D.R. Phillips, & A.G.O. Yeh (Eds.), Environment and ageing: Environmental policy, planning and design for elderly people in Hong Kong (pp. 7-12). Hong Kong: Centre of Urban Planning and Environmental Management, University of Hong Kong.

Siu, O.L. & Phillips, D.R. (2002). A study of family support, friendship, and psychological well-being among older women in Hong Kong. International Journal of Aging and Human Development, 55, 295-315.

Siu, O.L., Phillips, D.R., Yeh, A., & Cheng, K.H.C. (2003). Housing environment and psychological well-being of older persons in Hong Kong: The mediating and moderating influences of selfesteem and feelings of control. Unpublished manuscript, Hong Kong: Lingnan University.

Siu, O.L. & Wong, K.C. (2001). Living environment, self-image, and self-esteem among older persons in different housing types in Hong Kong. Paper presented at the XVIIth World Congress of Gerontology held in Vancouver, July.

Weenig, M.W., Schmidt, H., & Midden, C.J.H. (1990). Social dimensions of neighbourhoods and effectiveness of information programs. Environment and Behavior, 22, 27-54.

Yeh, A.G.O. (1999). The changing spatial distribution of elderly population and its planning implications. In D.R. Phillips, & A.G.O. Yeh (Eds.), Environment and ageing: environmental policy, planning and design for elderly people in Hong Kong (pp. 81-9l). Hong Kong: Centre of Urban Planning and Environmental Management, University of Hong Kong.

Yeung, A. & Chow, E. (2000). Correlates of subjective well-being of Chinese elderly in Hong Kong. Journal of Social Work Research and Evaluation, 1, 165-184.