Title

Personal and Neighbourhood Indicators of Quality of Urban Life: A Case Study of Hong Kong

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Abstract

This paper provides an overview of findings from a recent survey of quality of urban life (*QOUL*) in Hong Kong which focuses on: (a) individuals' subjective assessment of their *overall quality of life* (*QOL*) and of a set of *QOL life domains*, and (b) their level of satisfaction for three levels of *QOUL living domains*: their *housing*, their *neighbourhood*, and *Hong Kong as a whole*. Differences between demographic and socio-economic groups are discussed. The paper also reports on preliminary results of multivariate modelling to identify factors that might explain variations in individual levels of satisfaction with their *overall QOL* and with the three levels of *QOUL living domains*. The Hong Kong survey of *QOUL* is compared to those of Brisbane and of the greater Detroit region to highlight differences between urban regions in the east and west. The results show that Hong Kong is still lagging far behind the two western regions in most aspects of the *QOL life domains* and the three *QOUL living domains*. The comparisons have implied that the differences between these urban regions are beyond east-west influence in the perception of quality of life and more attributable to disparities in urban environments.

Keywords

Subjective quality of life; quality of life domains; quality of urban life domains; modelling QOL/QOUL in Hong Kong.

Title

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1. Introduction

The investigation of quality of life (QOL) - and more specifically quality of urban life (QOUL) as it explicitly relates to *place* - has long been of interest to social scientists. The measurement and assessment of QOL, the investigation of its effects on human behaviour such as migration and residential location choices (Campbell et al., 1976b; Zehner, 1977; Golledge & Stimson, 1987; Keeble, 1990; Ley, 1996; Glaeser et al., 2000; Liaw et al., 2002), and how it relates to people's life satisfaction, well-being and happiness, are increasingly important topics within the social sciences (Kahneman et al., 1999; Diener & Suh, 2000; Dissart & Deller, 2000; White, 2006; Eid, 2007; Lambiri et al., 2007; Diener & Biswas-Diener, 2008; Lyubomirsky, 2008; Thaler & Sunstein, 2008; van Praag, 2008; Weiner, 2008). In addition, it is important to consider the broader implications of QOUL for urban policy, planning and public action (Dahmann, 1985; Mulligan et al., 2004).

Marans & Stimson (2011) provide a comprehensive review of QOL and QOUL research theory and methods, as well as empirical investigations in a range of urban contexts. QOL is certainly a multi-faceted concept that has attracted the attention of researchers from many disciplines. Over the last decade or so there has been something of a resurgence of interest in QOL issues and related phenomena, including initiatives such as formation of the *International Society for Quality-of-Life Studies*, which holds an annual conference and has launched the journal *Applied Research in Quality of Life*.

Two broad approaches to the investigation of QOL are evident in the literature:

1. The objective approach, which is typically confined to the reporting of analysis of secondary data - usually aggregated data at different geographic or spatial scales - that are available mainly from official governmental data collections, including sources such as the census (for an overview, see Marans & Stimson, 2011). This approach is often associated with social indicators research.

2. The subjective approach, which is specifically designed to collect primary data at the disaggregate unit record (or individual) level using social survey methods, where the focus is on the peoples' behaviours and assessments, or evaluations, of aspects of QOL in general, and of QOUL in particular (for an overview, see McCrea et al., 2011).

The nature and the strength of the links between broad objective dimensions and subjective evaluations of urban environments represents an on-going research challenge to inform how planning and other policy interventions might contribute to improving the QOUL. Much of the published empirical research investigating QOUL has been conducted in the situational context of western cities, with a paucity of empirical investigations having been undertaken in high density eastern cities which are the situational context for the rapid rate of contemporary urbanisation that is occurring in the world and where most of the mega-city regions are emerging (Marans & Stimson, 2011; McCrea et al., 2006; Parkes et al., 2002; von Wirth et al., 2015).

This paper focuses on the subjective approach to the investigation of QOUL in Hong Kong. Noting the relative paucity of QOL-related research that has a specific Chinese population or Chinese urban context focus, this paper provides a brief overview of QOL related research that has been undertaken and highlights some research gaps. That is followed by an introduction to a model framework widely used to investigate QOUL which incorporates multi-levels of living domains enabling the integration of environmental context attributes into the assessment of levels of satisfaction with those living domains. A description of the survey instrument entails a 5-point Likert scale used to collect data on survey respondent's subjective assessment of *QOL life domains* and *QOUL living domains*. The survey findings cover people's subjective assessment of their *overall QOL* based on a set of *QOL life domains* and their levels of satisfaction with respect to three levels of *QOUL living domains* in Hong Kong (*housing*; *neighbourhood*; and *Hong Kong* as a whole). Variations in the mean scores between demographic and social-economic groups of survey respondents with respect to those domains are discussed. That is followed by interpretation of the results of preliminary multivariate modelling undertaken to investigate demographic and socio-economic factors that might explain variations in individuals' subjective evaluations of their QOL and of those urban attributes that might explain variations in people's levels of satisfaction with the three QOUL levels of living domains. The paper concludes with a summary of the findings and further modelling that will be undertaken for the more detailed investigation of the links between objective and subjective evaluation of QOL/ QOUL in Hong Kong.

2. Quality of Life Research in Hong Kong

There are literally many thousands of publications in the social sciences - and also in the medical sciences - relating to research into QOL issues, but there is a relatively low incidence of such studies that explicitly have a Chinese population or a Chinese urban context focus (Shek, 2010). That represents a significant gap in QOL research, particularly given the huge Chinese population and the rapid rate of urbanisation and the emergence of many Chinese mega-cities in in the contemporary world. In addition, Shek (2010) says that because:

> "… culture can play an important role in the conceptualisation and experience of quality of life",

then:

> "… the predominance of studies based on non-Chinese participants limits our understanding of the related phenomena in the Chinese culture" (Shek, 2010: p. 357).

2.1 Recent studies

Over the last decade or so there has been an increase in the incidence of research which addresses that gap. The two special issues of *Social Indicators Research* published in 2005 and 2010 examined QOL of Chinese people covering diverse perspectives/topics and a mix of methodological approaches. Much of the published research on QOL in the Chinese context - and indeed in the wider Asian context - has been undertaken by researchers in Hong Kong and/or focuses on that city as a situational context for the investigation of QOL issues. A QOL index was established for Hong Kong using both objective measures derived from official data sources and subjective measures (survey-based) across a range of QOL domains (Chan et al., 2005).

Not surprisingly, there is overwhelming emphasis on QOL studies conducted within a health context, and in particular with respect to elderly people. An example is an investigation by Lau et al. (2006) that used focus groups to explore how occupational therapy might improve the perceived QOL of elderly people in Hong Kong *vis-à-vis* a range of factors relating to physical, functional, cultural and psychological, social and economic well-being. Another by Chou & Chi (2010) used a longitudinal study to identify variables predicting life satisfaction among Chinese elderly people, including the roles of gender, age, marital status, years of education, chronic illness, functional impairment, self-rated health, somatic complaints, vision, hearing, social network, social support from family members, quality of social support and financial strain.

There are also examples of comparative research on QOL. Liao et al. (2005) used large scale sample survey research to compare perceived QOL of Hong Kong with Taiwan, but the emphasis was on investigating 'perceived fairness' with regard to influence of personal effort within the opportunity structure of society. Lau et al. (2005) investigated the significance of the personal wellbeing index as a predictor of satisfaction with happiness in a cross-cultural context using a sample survey in both Hong Kong and Australia.

2.2 Focus of studies of QOL in Hong Kong and research gaps

Shek & Lee (2007: p.1222) highlighted their observations about QOL studies in Hong Kong indexed in major databases. They noted that most of the published works represented micro studies, involved data collection, adopted the personal-family-societal approach, were quantitative in nature, focused on adults or people with special needs, used as opposed to

developed QOL measures, and Hong Kong's QOL measures were seldom compared with other places. They further identified seven QOL research gaps in Hong Kong. Of particular relevance to this study is "the debate surrounding whether objective indicators (such as official statistics) or subjective indicators (such as opinion surveys) are better indicators of QOL" (Shek & Lee, 2007: p.1223).

However, what is evident is that there is an almost complete dearth of research that explicitly takes a QOUL perspective in which there is an attempt to: (1) develop objective indicators of QOL (in a social and built environment context); (2) measure subjective assessments or evaluations of QOL domains across different levels of scale; or (3) take an approach which integrates subjective and objective measures of QOUL. The research project on which this paper is based explicitly sets out to investigate the above research gaps for Hong Kong. This paper is the first from this wider research project and addresses the second research gap by giving an overview of subjective QOUL in Hong Kong.

2.3 Living domains model framework for investigating QOUL

The Hong Kong QOUL project adopted a widely used framework in QOUL research proposed in the 1970s by researchers from the Institute for Social Research (ISR) at the University of Michigan (Marans & Rodgers, 1975; Campbell et al., 1976a). It is a model that can readily incorporate a range of demographic, social, economic and environmental relationships, while taking into account an individual's level of satisfaction with different levels QOUL living domains. The model framework is shown in Figure 1.

[Insert Figure 1]

The model rests on these four principles:

- the *experiences* of people are derived from their interactions with the surrounding environment;
- the *subjective experiences* of people are different from the objective environment;
- people *respond* to their experiences with the environment; and
- the *level of satisfaction* in various *life domains* contributes to the *overall QOL experienc*e.

The model (Figure 1) specifies a series of *linkages* between various *objective* attributes of each *living domain* and *subjective* measures satisfaction with those domains, which in turn could be influenced by a range of individual characteristics and individual standards of comparison.

The ISR researchers suggested that *satisfaction with living* could be viewed at *multiple levels* of analysis - or for different *living domains.* Commonly three such domains are used (Marans & Rodgers, 1975; Campbell et al., 1976a; Bruin & Cook, 1997; Lu, 1999; Parkes, et al., 2002; Sirgy & Cornwell, 2002), namely:

- level of satisfaction with *housing*;
- level of satisfaction with the *neighbourhood*; and
- level of satisfaction with the *wider community* or the broader *city/metro-region*.

This framework for investigating QOL/QOUL enables us to replicate for the Hong Kong study of QOUL the methodology and empirical analyses used in the QOUL study of Brisbane in Australia (McCrea et al., 2015; McCrea et al., 2006; Stimson et al., 2011) and the QOUL study of Detroit in the US (Marans, 2008; Marans & Kweong, 2011) to investigate levels of satisfaction across three *levels of urban living domains - housing , neighbourhood,* and the

wider community or *Hong Kong as a whole* - and how satisfaction in those living domains might be predicted by assessments of urban attributes associated with that domain, and also by attributes associated with other domains, through hypothesised cross-paths and by personal characteristics.

3. The Hong Kong QOUL Survey

The Hong Kong QOUL project commenced in 2014 in two phases. Phase 1 focused on the development of a set of indicators measuring objective QOUL derived through secondary data analysis using data compiled for residential neighbourhoods across Hong Kong and using data from the census along with GIS-based environmental and urban facilities data (Chen, 2015). A typology of residential areas on a set of socio-economic and environmental objective measures of QOUL was thus derived. This paper focuses on reporting only the results in Phase 2, which is set to investigate the subjective assessment of individuals' *overall QOL* and of a set of *QOL life domains*, and their levels of satisfaction on the three levels of *QOUL living domains*: *housing*, *neighbourhood*, and *Hong Kong as a whole*.

3.1 Survey methodology

The Hong Kong QOUL survey was administered by the Public Opinion Programme at the University of Hong Kong which uses a survey frame designed to generate a random sample of households across Hong Kong that are used as a panel of persons that regularly participate in social surveys. It is a random sample of some 2,472 households across Hong Kong for the repeated undertaking of social surveys. That sampling frame has a standard error of 1.6%, with a sample error of ±3.1% at the 95% confidence level.

The survey focused on persons aged 18 years and over. It was necessary to gain the agreement of respondents to provide their residential address in order to geocode their residential location to which objective social and environmental data from other sources could be linked. That resulted in a useable sample of 1,169 respondents. The pattern of distribution of the sample respondents across Hong Kong is shown on Figure 2.

[Insert Figure 2]

3.2 The survey instrument

In the subjective approach to investigating QOUL, typically a survey instrument (questionnaire) is designed whereby survey respondents are asked to evaluate or assess various aspects of their lives, which often are presented as QOL domains of life (Marans & Rodgers, 1975; Campbell et al., 1976a). Usually responses such as levels of satisfaction are captured using a standard response format, such as a Likert scale, which yields a numerical rating. However, as aspects of QOL might not hold the same importance for everybody, the evaluation of the importance of each aspect might be built into a questionnaire used to collect information from the survey respondents.

The Hong Kong QOUL survey instrument collected three categories of information of the subjective assessment of individuals: Part A – life and living domains; Part B – social capital measures; and Part C – personal and family aspects (Figure 3). Using a 5-point Likert scale (5=very satisfied, 4=satisfied, 3=neutral, 2=dissatisfied, 1=very dissatisfied), respondents were asked a set of 11 *QOL life domains* relating to their life in general, as well as their level of satisfaction with regard to three levels of *QOUL living domains* at current housing,

neighbourhood in which they live, and Hong Kong in general. Respondents were asked to rate the importance of a set of factors (again using a 5-point Likert scale) that may have influenced their decision to choose their current residential location. The survey also asked respondents to identify the top areas in Hong Kong which they consider have the best QOUL.

[Insert Figure 3]

Although not discussed in this paper, the survey collected information from which it was possible to derive measures of *anomie* and *social capital* (Western et al., 2007). Finally, the survey instrument also collected information on the usual demographic and socio-economic attributes of the survey respondents. Care was taken to ensure the Hong Kong QOUL survey instrument was designed to enable comparative analysis between eastern and western urban contexts, especially in reference to Brisbane (Stimson et al., 2011) and Detroit (Marans & Kweon, 2011).

3.3 Methods of analysis

The study involves various descriptive statistics and one-way ANOVA with post-hoc Scheffe's test to compare within group and between group variations. It then uses multivariate analysis to investigate the degree to which variations in individuals' assessment of their *overall QOL* and their levels of satisfaction might be explained by the 11 *QOL life domains.* Besides, it is also useful to examine the degree to which variations in individual levels of satisfaction with the three levels of *QOUL living domains* - housing, the neighbourhood, and Hong Kong as a whole - might be explained by specific urban attributes relating to life in those living domains.

The multivariate analysis incurs a two-step process. First, the Principal Components Analysis (PCA) is used to convert a set of observations on possibly correlated variables to sets of values of linearly uncorrelated variables (principal components) in which successive components extracted account for decreasing amounts of the total variance in the data under the constraint that is orthogonal to the preceding components. Here, PCA will establish relationships among the subjective assessment of urban attribute variables and their contribution to each of the three levels of *QOUL living domains*. Typically the focus is on those components with Eigenvalues $\geqslant 1.0$ and on those variables with loadings $\geqslant$ +/-0.4. Second, the multiple regression analysis is used to estimate the relationships among variables where the focus is on the dependent (outcome) variable and one or more independent (predictive) variables. The ordinary least square regression is adopted to determine the degree of power of specific urban attributes as independent variables that account for the variance in level of satisfaction with the three levels of *QOUL living domains.*

4. The subjective assessment of overall QOL, QOL life domains, and QOUL living domains in Hong Kong

A summary of the Hong Kong survey of QOUL includes the following findings: (i) individual's subjective assessment of their *overall QOL* as well as the various *QOL life domains*, and (ii) people's subjective assessment of the three levels of QOUL *living domains* by *housing*, *neighbourhood*, and *Hong Kong as a whole.* The discussion will make reference to the degree to which findings of the Hong Kong survey of QOUL do vary (although there are some similarities) from those of Brisbane (Stimson et al., 2011) and of the greater Detroit region (Marans & Kweon, 2011). Results of multivariate analysis follow with a summary of within group variations based on demographic and socio-economic characteristics. This

discussion is supplemented by regression models of the *overall QOL* and the three levels of QOUL *living domains*.

4.1 People's assessment of their overall QOL and of QOL life domains

Figure 4 summarises the respondents' ratings of their *overall QOL* using the 5-point Likert scale. Most people in Hong Kong are generally somewhat ambivalent about their overall QOL, with 41% saying they are 'neither satisfied nor dissatisfied'. Only 43% say they are positive in their assessment of their overall QOL, with 41% indicating they are 'satisfied' but only 2% saying they are 'very satisfied'. A minority of 16% are negative about their overall QOL, with 14% indicating they are 'dissatisfied' and only 2% saying they are 'very dissatisfied'. The mean score on this general measure of Hong Kong people's subjective satisfaction with their *overall QOL* is 3.29, which is lower than the mean score on this measure for the Brisbane study in which the vast majority of people (89%) were positive about their 'overall QOL' with many people (38%) reporting they were 'very satisfied' and a negligible (2%) incidence of people being negative about their overall QOL. However, the findings in the greater Detroit region study showed somewhat lower incidence positiveness with overall QOL placing it a little more towards the level of satisfaction found in Hong Kong.

[Insert Figure 4]

In reference to respondents' level of satisfaction on the 11 aspects of their life relating to various *QOL life domains* (Figure 5; see also Figure 3), it is evident that people in Hong Kong rate most positively (in descending order) those aspects of their life relating to domains of life linked to: relationships with family (74%); independence or freedom (58%); social relationships (51%); health status (49%); amount of free time (51%); leisure activities (44%);

housing (44%); and overall standard of living (41%). At the same time, people in Hong Kong rate most negatively those aspects of their life relating to domains of life linked to: amount of money available to you personally (34%); financial situation (23%);–employment status (21%); and amount of free time (19%). These results for Hong Kong differ somewhat from how people in the Brisbane survey rated their level of satisfaction on *QOL life domains*. People in Brisbane reported mean satisfaction scores of above 4 in their 'social relationships', 'family life', 'independence or freedom', and 'overall standard of living', with between 3.78 and 3.89 in their 'employment status', 'health', and 'leisure activities'. The Brisbane sample had the lowest mean satisfaction scores with the 'amount of money available to you personally' and the 'amount of time available to do the things you want'. The greater Detroit region study tested a more restricted set of *QOL life domains*. It was found that the domains rated most positively with the highest levels of satisfaction were for 'friends', 'family', and 'standard of living', with lower levels of satisfaction with 'health', 'leisure time', and 'employment, while the domain with the lowest levels of satisfaction was 'time to do things you want to do'.

[Insert Figure 5]

Not surprisingly, the Hong Kong survey respondents nominated their 'health status' as the single most important thing contributing to their life, followed a long way behind by their 'financial status', then their 'living environment', and their 'housing'. Other factors were hardly mentioned.

4.2 Level of satisfaction with QOUL living domains

Figure 6 shows the levels of satisfaction of people in Hong Kong with respect to the three levels of *QOUL living domains - housing*, the *neighbourhood*, and *Hong Kong as a whole*. Table 1 shows the comparison of the levels of satisfaction between Hong Kong, Brisbane and the greater region of Detroit. It is evident that a small majority of 51% of people in Hong Kong are positive about their *current housing*, with 44% being 'satisfied' and just 7% being 'highly satisfied'. A small proportion of 16% are negative about their current housing, with only 13% being 'dissatisfied' and just 3% being 'highly dissatisfied'. The mean score on the 5-point Likert scale is 3.38. This level of satisfaction with housing in Hong Kong is considerable lower than was found to be the case in the Brisbane study where 85% were positive about their current housing with 40% being 'very satisfied', and fewer than 5% were negative about their housing. The findings from the Detroit study showed relatively high scores on the current housing scale, but the incidence of positive satisfaction was lower than for Brisbane placing the greater Detroit region somewhat closed to Hong Kong.

[Insert Figure 6]

[Insert Table 1]

People in Hong Kong are also somewhat more positive about *living in their neighbourhood*, with 51% being 'satisfied' but just 6% are 'highly satisfied'. Only a very small proportion of 5% negative about their neighbourhood, with 4% being 'dissatisfied' and just 1% being' highly dissatisfied'. The mean score on the 5-point Likert scale is 3.58. These levels of satisfaction with neighbourhood in Hong Kong are considerable lower than was found in the Brisbane study in which a high 87% were positive about their neighbourhood, and just 4% were negative about their neighbourhood. The results from the greater Detroit study also showed a relatively high proportion of people being positive about their neighbourhoods but less so than in Brisbane.

People in Hong Kong are certainly very ambivalent about the *overall QOUL in Hong Kong as a whole*, with 44% being 'neither satisfied nor dissatisfied'. Only 25% are *positive* about it, with only 22% saying they are 'satisfied' just 3% indicating they are 'very satisfied'. But almost one-third (31%) of people are *negative* about overall QOUL in Hong Kong as a whole, with 26% saying they are 'dissatisfied' and 5% saying they are 'very dissatisfied'. The mean score on the 5-point Likert scale is low at 2.90. This finding contrasts markedly with the Brisbane study in which a high 91% of the survey respondents were positive about living in the Brisbane region as a whole, with a remarkably high 47% saying they were 'very satisfied, with a negligible incidence of people being negative. For greater Detroit people were also largely positive about living in their region but considerably less so than was the case for Brisbane, but considerably more so than for people in Hong Kong.

When the focus is on specific satisfaction levels of the living domain, people in Hong Kong tend to be most satisfied with their *neighbourhood*, while their level of satisfaction with their *housing* is a little lower but still positive, but they are *negative* or ambivalent in their assessment with the *overall QOUL in Hong Kong as a whole*. Compared with the two western regions, Hong Kong has the lowest level of satisfaction in the *overall QOL* and the three *QOUL living domains*. Hong Kong is still lagging far behind the two western regions, especially Brisbane, in many aspects of the *QOL life domains*. Hong Kong has been characterised as an ultra-dense Chinese metropolis that is plagued with problems of housing availability and affordability. This could be the reason why housing has the highest correlation with the *overall QOL* for the people in Hong Kong (See Supplementary Table S7). The dense urban development could be the reason why Hong Kong is so much different in the level of satisfaction from the less dense western regions. The less favourable *overall QOL* in both

Hong Kong and greater Detroit compared with Brisbane also suggests that the variance is more related to urban environments than east-west differences.

4.3 Multivariate analysis

4.3.1 Differences between demographic and socio-economic groups

The above findings show aggregate effects of people in Hong Kong comprising of individuals with different demographic and socio-economic characteristics (Part C in Figure 2). It is common to find variations between demographic and socio-economic groups in their subjective assessment of levels of satisfaction with the *overall QOL* and the three levels of *QOUL living domains*. Differences in the mean satisfaction scores of the survey respondents on these scales have been calculated and plotted to detect differences, as listed in Table 2.

[Insert Table 2]

Table 2 shows health status and size of dwelling exhibit significant within group variations, at 99% confidence interval, in the mean scores for the *overall QOL* and the three levels of *QOUL living domains*. It is evident that the mean satisfaction scores on all the scales tend to decrease with worsening self-rated health status, which is especially apparent for the 'Hong Kong as a whole QOUL living domain'. However, the mean satisfaction scores increase with increasing size of the dwelling, and that is especially marked for the 'housing QOUL living domain'.

Household monthly income and age both display significant within group variations, at 99% confidence interval in the mean scores for three of the four scales and at 95% confidence

interval for the remaining one. There does seem to be an increase in the mean satisfaction scores on the scales with increasing household income, peaking at a monthly income of '≥HK$80,000'. The increasing income effect is evident for mean scores on people's subjective assessment of their 'overall QOL' and on level of satisfaction on the 'housing' and 'neighbourhood' QOUL living domain. The mean satisfaction scores for age on the scales show a statistically significant but slight dipping between the '18-24' and '25-44' year age cohorts, but then increasing substantially with increasing age to be considerably higher for the '65 years and over' age cohort. This increasing-satisfaction-with-age effect is especially marked for the level of satisfaction for the 'Hong Kong as a whole QOUL living domain'.

The next three groups by type of dwelling, engagement-in-work, and marital status all present significant within group variations, at 99% confidence interval, in the mean scores for three of the four scales. There appear to be marked variations in the mean satisfaction scores on all of the scales relating to the type of housing people occupy except for the 'Hong Kong as a whole QOUL living domain' which exhibits no real within group differences. Lowest levels of satisfaction seem to relate to people living in a 'private rental housing' and to those living in the 'other' housing category, while the highest mean scores are for people living in 'private housing'. As for the type of engagement-in-work, there are no apparent within group differences for the 'neighbourhood QOUL living domain'. The 'unemployed' and those 'working part-time' appear most dissatisfied whereas people engaged in 'full-time home duties' and those who are retired seem to be more satisfied with their 'overall QOL' and with 'housing' and 'Hong Kong as a whole QOUL living domain. There are also no significant within group differences in mean satisfaction scores for marital status on the 'neighbourhood QOUL living domain'. It is evident that 'single' and 'divorced/separated' people have lower mean satisfaction scores in other domains. While people who are 'married or have a partner'

have slightly higher mean scores, the mean score increases markedly for people who are 'widowed' although the difference is not statistically significant according to the post-hoc Scheffe's test. It is speculated that retirement is likely to improve the satisfaction score among the 'widowed' as more than half of the 'widowed' group has retired.

Housing tenure, cost of housing, and occupational status all demonstrate significant within group variations, at 99% confidence interval, for the *overall QOL* and the 'housing QOUL living domain'. The highest mean scores on housing tenure are for those who occupy 'provided or partially subsidised housing', followed by those who are home owners. The mean scores seem to be a little higher for 'outright owners' than those 'paying-off' their dwelling. The means are lowest for 'renters' who scored particularly low on the 'housing' and 'Hong Kong as a whole QOUL living domains'. With regard to the cost of housing as a proportion of total household income, the mean satisfaction scores decrease as housing costs exceed 30% with increasing dissatisfaction as housing cost consumes over 40% of household income. In terms of types of occupation, the mean scores for people's levels of satisfaction are highest for 'managers and administrators' and for 'craft and related workers', but they tend to drop for plant and machinery operators' and for 'associate professionals'.

It would seem that in general there is little difference in the mean satisfaction scores across all the scales for people 'born in Hong Kong' and for those 'born elsewhere'. However, the mean score on the 'Hong Kong as a whole QOUL living domain' for people born in Hong Kong is markedly lower and significantly different from that 'born elsewhere'. Considering the level of education, it appears that the mean satisfaction scores on the 'Hong Kong as a whole QOUL living domain' decline with an increasing level of education. One possible explanation to this is that people with higher level of education are more conscious and

discontent with the overall situation in Hong Kong, particularly in the domains of air and noise pollution.

4.3.2 Effect of assessment of QOL life domains on individual assessment of overall QOL

The PCA performed on the 11 *QOL life domains* (Part A in Figure 2) for which the survey respondents were asked to rate their level of satisfaction extracted two components: (1) the first component with an Eigenvalue of 5.0 explains 46% of the total variance, on which all of the *QOL life domain* variables have significant high positive loadings; and (2) a second component with an Eigenvalue of 1.1 explains a further 10% of the total variance, on which the life domain variables 'amount of time to do things you want to do' and 'independence or freedom' have significant moderate positive loadings.

A regression model was run using survey respondent's assessment of their levels of satisfaction with the 11 *QOL life domains* as independent variables that might explain variations in respondent's assessment of their *overall QOL* (Table 3). The adjusted R^2=0.69 means that almost 70% of the variance in the scores of the survey respondents on the 5-point Likert scale for the subjective assessment of their *overall QOL* is explained by their levels of satisfaction with those 11 *QOL life domains* that are the independent variables in Table 3. The regression model results show three major observations. First, the *QOL life domain* 'overall standard of living' is a very highly significant explanatory factor (β=0.573, t=22.117, p<0.001), a finding that is not surprising as it is highly correlated with the dependent variable of *overall QOL*. Second, three other *QOL life domain*s are highly significant explanatory

factors, namely 'housing situation' (β=0.134, t=6.071, p<0.001), 'financial situation' (β=0.115, t=4.198, p<0.001), and 'employment status' (β=0.086, t=3.903, p<0.001). Third, people's level of satisfaction with their 'independence or freedom' (β=0.058, t=1.968, p<0.05) is a lesser but still significant explanatory variable.

[Insert Table 3]

4.3.3 Effect of urban attributes on assessment of urban attributes on levels of satisfaction with three levels of QOUL living domains

QOUL Living domain: 1 - Housing

The PCA performed on the 7 urban attributes relating to the *housing level QOUL living domain* (Part A, 1 – Housing in Figure 2) for which the survey respondent were asked to rate their levels of satisfaction extracted two components: (1) the first component with an Eigenvalue of 3.9 explains 60% of the total variance, on which all the housing life domain urban attribute variables have a high significant loading; and (2) a second component with an Eigenvalue of 1.2 explains a further 17% of the total variance, on which the housing life domain variables 'adequacy of rooms for family' and 'housing situation meeting needs of family' have significant moderate negative loadings, and the attributes 'ventilation' and 'sunniness' have significant moderate positive loadings.

A regression model was run using survey respondent's assessment of their levels of satisfaction with the 7 urban attributes as independent variables that might explain variations in respondent's subjective assessment of their current *housing* situation as the dependent variable (Table 4). The adjusted R^2=0.63 means that a little more than three-fifths of the

variance in the scores of the survey respondents on the 5-point Likert scale for the subjective levels of satisfaction with their current *housing* is explained by their levels of satisfaction with those 7 urban attributes that are the independent variables in Table 3. The regression model results report two major findings. First, people's level of satisfaction with the 'overall comfort level' of their housing (β=0.435, t=14.201, p<0.001) is a particularly significant variable influencing the subjective assessment of their current *housing*. Second, the other variables that are highly significant are how their 'current housing situation' meets the family needs (β=0.245, t=6.393, p<0.001), the 'affordability / cost' of their housing (β=0.098, t=4.243, p<0.001), and the 'adequacy of rooms' for the family (β=0.116, t=3.317, p<0.01).

[Insert Table 4]

QOUL Living domain: 2 – Neighbourhood

The PCA performed on the 8 urban attributes relating to the *neighbourhood level QOUL living domain* (Part A, 2 – Neighbourhood in Figure 2) for which the survey respondent were asked to rate their levels of satisfaction extracted three components: (1) the first component with an Eigenvalue of 3.1, which explains 38% of the total variance, on which all of the neighbourhood living domain variables have significant positive loadings, but on which the neighbourhood living domain variables 'employment opportunities' and 'jobs local social workers are doing' in particular have high positive loadings; (2) a second component with an Eigenvalue=1.4, which explains a further 17% of the total variance, on which the variables 'safety walking after dark' and 'breaking and entering' have significant moderate positive loadings; and (3) a third component with an Eigenvalue=1.0, which explains a further 13% of the total variance, on which the variable 'built density' has a significant moderate positive

loading and ‘convenience to walk to stores, parks and other amenities’ has a significant moderate negative loading.

A regression model was run using survey respondent’s assessment of their levels of satisfaction with the 8 urban attributes as independent variables that might explain variations in respondent’s subjective levels of satisfaction with their *neighbourhood* as the dependent variable (Table 5). The adjusted R^2=0.402 means that only a little more than one-third of the variance in the scores of the survey respondents on the 5-point Likert scale for the subjective assessment with their *neighbourhood* is explained by their levels of satisfaction with those 8 urban attributes domains that are the independent variables in Table 5. The regression model results show three major outcomes. First, the urban attributes relating to ‘safety walking after dark’ (β=0.224, t=7.444, p<0.001) and ‘built density’ (β=0.152, t=8.240, p<0.001) are important highly significant variables explaining people’s level of satisfaction with their neighbourhood. Second, three other urban attributes of ‘convenience to walk to stores, parks and other amenities’ (β=0.144, t=6.513, p<0.001), ‘willingness of people to help each other’ (β=0.098, t=4.320, p<0.001) and ‘home safety (such as breaking and entering)’ (β=0.093, t=4.056, p<0.01) are also significant variables. Third, of lesser explanatory power but still significant, is the ‘jobs local social workers are doing’ (β=0.060, t=2.227, p<0.05).

[Insert Table 5]

QOUL Living domain: 3 - Hong Kong as a whole

The PCA performed on the 11 urban attributes relating to the *Hong Kong as a whole level QOUL living domain* (Part A, 3 – Hong Kong as a whole in Figure 2) for which the survey respondent were asked to rate their levels of satisfaction extracted two components: (1) the

first component with an Eigenvalue=4.9, explaining 44% of the total variance, on which all the Hong Kong as a whole living domain variables have significant moderate positive loadings; and (2) a second component with an Eigenvalue=1.3, explaining a further 12% of the total variance, on which the variables 'air quality' and 'noise pollution' have significant moderate negative loadings.

A regression model was run using survey respondent's assessment of their levels of satisfaction with the 11 urban attributes as independent variables that might explain variations in respondent's subjective assessment of the Hong Kong as a whole as the dependent variable (Table 6). The adjusted R^2=.0497 means that just half of the variance in the scores of the survey respondents on the 5-point Likert scale for the subjective level of satisfaction with *Hong Kong as a whole* is explained by their levels of satisfaction with those 11 urban attributes of Hong Kong that are the independent variables in Table 5. The regression model results offer four key points. First, the urban attributes that are most highly significant in explaining variations in people's assessment of QOUL in Hong Kong as a whole are 'climate' (β=0.237, t=8.322, p<0.001), 'economic conditions' (β=0.156, t=5.564, p<0.001), and the 'cultural environment' (β=0.141, t=4.870, p<0.001). Second, the variables 'air quality' (β=0.107, t=3.300, p<0.01), 'natural environment' (β=-0.090, t=-3.382, p<0.01), and 'noise pollution' (β=0.079, t=2.597, p<0.05) are also highly significant. Third, other highly significant explanatory variables are 'transportation' (β=0.074, t=2.676, p<0.01), 'services and facilities (retail and entertainment)' (β=0.089, t=3.279, p<0.01), and the 'provision of educational facilities' (β=0.093, t=3.095, p<0.01). Fourth, the lesser important but still significant variables are 'social conditions' (β=0.067, t=2.443, p<0.05), and the 'provision of health services' (β=0.065, t=2.341, p<0.05).

[Insert Table 6]

5. Conclusion

This paper discusses findings from the survey of QOUL in Hong Kong in which the focus has been on investigating variations in people's subjective assessment of their *overall QOL* and of a set of *QOL life domains,* and their levels of satisfaction for three levels of *QOUL living domains,* namely their current *housing*, the *neighbourhood*, and *Hong Kong as a whole*. Some comparative findings with two earlier studies of QOUL in Brisbane in Australia and in greater Detroit in the US reveal some important differences.

People in Hong Kong appear ambivalent about their *overall QOL,* with a little more than two fifths being positive and less than one fifth being negative about it. This is in contrast to the high levels of positiveness that a sizeable majority of people had with their overall QOL in Brisbane (where this was extremely high) and in greater Detroit. The life domains on which a majority of people in Hong Kong have positive assessments are 'relationships with family', 'independence or freedom', and 'social relationships', while a considerable minority have negative assessments regarding the 'amount of money available to you personally', their 'financial situation', and their 'housing situation'.

Hong Kong people seem to be considerably less satisfied with the three *QOUL levels of living domain* than is the case for residents of Brisbane and of greater Detroit. About 50% of people in Hong Kong are positive in their level of satisfaction with both their *housing* and with their *neighbourhood*, with only a small proportion being negative about their *neighbourhood* and only 16% being negative about their *housing*. But people in Hong Kong are much less satisfied

with *Hong Kong as a whole* with only one-quarter being positive and one-third being negative in their level of satisfaction on this living domain.

It is evident that people's demographic and socioeconomic characteristics do play a role in affecting their levels of satisfaction with their *overall QOL* and with the three *QOUL living domains*, but this aspect needs to be more fully explored than it has been in this paper.

The preliminary modelling undertaken to investigate the effect of sets of urban attributes in explaining variations in the levels of satisfaction of Hong Kong people with respect to the three levels of *QOUL living domains* indicates that:

- people's level of satisfaction with their *overall QOL* is significantly affected by their assessments of their 'overall standard of living', their 'housing situation', and their 'financial situation' and 'employment status', and by their 'independence or freedom'.
- people's level of satisfaction with *housing* level of QOUL living domain is significantly affected by their level of satisfaction with the 'overall comfort level' of their housing, how their 'current housing situation meets the family needs', the 'affordability / cost' of their housing, and the 'adequacy of rooms for the family'.
- people's level of satisfaction with the *neighbourhood* level of QOUL living domain is significantly affected by urban attributes relating to 'safety walking after dark', 'home safety (such as breaking and entering)', the 'willingness of people to help each other', the 'convenience to walk to stores, parks and other amenities', and the 'performance of local councillors in terms of hearing voices of residents'.
- people's level of satisfaction with the *Hong Kong as a whole* QOUL living domain is significantly affected by 'economic conditions', the 'cultural environment', 'climate'; 'air quality', 'noise pollution', the 'natural environment', 'transportation' the

'provision of educational facilities', the 'provision of health services', 'services and facilities (retail and entertainment)',and 'social conditions' in Hong Kong.

There remains much to be done to explore these relationships more thoroughly, in particular to model the links in the relationships between people's subjective assessment of their *overall QOL* and their levels of satisfaction with the three levels of *QOUL living domains* and the explanatory roles of both those subjective assessments and the moderating effects of sets of objective attributes of the urban environment and of the personal characteristics of the survey respondents. There is also the need to examine variation between subjective assessment of the *overall QOL* against objective measurements of the living environment, particularly in reference to urban morphology, air quality, service provision, and convenience at three spatial levels of *housing*, *neighbourhood,* and *Hong Kong as a whole*.

Footnotes

1 Note that both the Brisbane and the greater Detroit studies found that there were within region variations in the levels of people's assessment of their overall QOL and in their levels of satisfaction on the three levels of QOUL living domains. These variations need to be borne in mind as the overall findings from the QOUL surveys for the three cities in this paper were compared at the aggregate city regions.

References

Bruin, M. J. & Cook, C. C. (1997). Understanding constraints and residential satisfaction among low-income single-parent families. *Environment and Behavior,* 29(4), 532-553.

Campbell, A., Converse, P.E. & Rodgers W.L. (1976a). *The Quality of American Life: Perceptions, Evaluations and Satisfactions.* New York, Russell Sage Foundation.

Campbell, A., Converse, P., Rodgers, W. & Marans, R. W. (1976b). The residential environment, in A. Campbell, P. Converse and W. Rodgers (Eds.), *The Quality of American Life: Perceptions, Evaluations and Satisfactions*. New York, Russell Sage Foundation, pp. 217-266.

Chan, Y.K., Kwan, C.C.A. & Shek, T.L.D. (2005). The CHHK Quality of Life Index. *Social Indicators Research*, 71, 259-289.

Chen, S. (2015). Measuring Environmental Quality of Life: A GIS Approach to Deriving Objective Measures using Hong Kong as a Case Study, PhD Thesis, The University of Hong Kong.

Chou, Y-L. & Chi, I. (2010). Determinants of life satisfaction in Hong Kong Chinese elderly: A longitudinal study. *Aging and Mental Health,* 3(4), 328-335.

Dahmann, D.C. (1985). Assessments of neighborhood quality in metropolitan America. *Urban Affairs Quarterly, 20*(4), 511-535.

Dissart, J.-C., Deller, S.C. (2000). Quality of life in the planning literature. *Journal of Planning Literature*, 1, 36-61.

Diener, E. & Biswas-Diener, R. (2008). *Happiness: Unlocking the Mysteries of Psychological Wealth.* Malden, MA., Blackwell Publishing.

Diener, E. & Suh, E.M (Eds.) (2000). *Culture and Subjective Well-being.* Cambridge, MA., The MIT Press.

Eid, M. (2007), *The Science of Subjective Wellbeing*. New York, Guilford Publications.

Glaeser, E., Kolko, J. & Saiz, A. (2000). Consumer city, *Working Paper 7790*. National Bureau of Economic Research, Cambridge, MA.

Golledge, R.G. & Stimson, R.J. (1987). *Analytical Behavioural Geography*. London, Croom Helm.

Kahneman, D., Deiner, D. & Schwartz, N. (Eds.) (1999). *Well-being: The Foundations of Hedonic Psychology*. New York, Russell Sage Foundation.

Keeble, D. (1990). Small firms, new firms, and uneven regional development in the United Kingdom. *Area*, 22, 234-245.

Lambiri, D., Biagi, B. & Rpyuela, V. (2007). Quality of life in the economic and urban economic literature. *Social Indicators Research*, 84, 1-25.

Lau, A., Chi, I. & McKenna, K. (2006). Self-perceived quality of life of Chinese elderly people in Hong Kong. *Occupational Therapy International*, 5(2), 118-139.

Lau, A.L.D., Cummins, R.A. & McPherson, W. (2005). An investigation into the cross-cultural equivalence of the Personal Wellbeing Index. *Social Indicators Research*, 72, 403-430.

Ley, D. (1996). *The New Middle Class and the Remaking of the Central City*. Oxford, Oxford University Press.

Liaw, K.L., Frey, W.H. & Lin, J.P. (2002). Location of adult children as an attraction for black and white elderly primary migrants in the United States. *Environment and Planning A*, 34 (2), 191-216.

Liao, T-S., Fu, Y-C. & Yi, C-C. (2005). Perceived quality of life in Taiwan and Hong Kong: An intra-culture comparison. *Journal of Happiness Studies*, 6, 43-47.

Lu, M. (1999). Determinants of residential satisfaction: Ordered logit vs. regression models. *Growth and Change*, 30(2), 264-287.

Lyubomirsky, S. (2008). *The How of Happiness: A Scientific Approach to Getting the Life You Want*. New York, The Penguin Press.

Marans, R. W. (2008). Quality of urban life research: Travel findings from the Detroit Area Study. *IAPS Bulletin of People-Environment Studies*, 33, Spring-Summer, 299-352.

Marans, R.W. & Rodgers, W. (1975). Toward an understanding of community satisfaction, in Hawley, A. and Rock, V. (Eds.), *Metropolitan America in Contemporary Perspective*. New York, Halsted Press, pp. 299-352.

Marans, R. & Kweon, B-S., (2011). The quality of life in metro Detroit at the beginning of the millennium, in R.W. Marans & R.J. Stimson (Eds.), *Investigating Quality of Urban Life: Theory, Methods and Empirical Research*. Social Indicators Research Series, Volume 45, Springer, Dordrecht, pp. 456.

Marans, R.W. & Stimson, R.J. (Eds.) (2011). *Investigating Quality of Urban Life: Theory, Methods and Empirical Research*. Social Indicators Research Series, Volume 45, Springer, Dordrecht.

McCrea, R., Shyy, T.K. & Stimson, R. (2006). What is the strength of the link between objective and subjective indicators of urban quality of life? *Applied Research in Quality of Life*, 1, 79-96.

McCrea, R., Stimson, R. & Western J. (2005). Testing a moderated model of satisfaction with urban living using data for Brisbane-South East Queensland, Australia. *Social Indicators Research*, 72, 121-151.

McCrea, R., Marans, R.W., Stimson, R. & Western, J. (2011). Subjective measurement of quality of life using primary data collection and the analysis of survey data, in R.W. Marans & R. J. Stimson (Eds.), *Investigating Quality of Urban Life: Theory, Methods and Empirical Research*. Social Indicators Research Series, Volume 45, Springer, Dordrecht, pp. 55-74.

Mulligan, G., Carruthers, J. & Cahill, M. (2004). Urban quality of life and public policy: a survey, in R. Capello & P.Nijkamp (Eds.), *Advances in Urban Economics*. Amsterdam, Elsevier Science B, pp. 729-802.

Parkes, A., Kearns, A. & Atkinson, R. (2002). What makes people dissatisfied with their neighbourhoods*? Urban Studies*, 39(13), 2413-2438.

Shek, D.T.L. (2010). Introduction: Quality of life of Chinese people in a changing world. *Social Indicators Research*, 95, 357-361.

Shek, D.T.L. & Lee, M. (2007). A comprehensive review of quality of life (QOL) research in Hong Kong. *The Scientific WorldJOURNAL: TWS Holistic Health and Medicine*, 7, 1222-1229.

Sirgy, M. J. & Cornwell, T. (2002). How neighborhood features affect quality of life. *Social Indicators Research*, 59(1), 79-114.

Stimson, R., McCrea, R. & Western, J. (2011). The Brisbane-South East Queensland region, Australia: Subjective assessment of quality of urban life and changes over time, in R.W. Marans & R. J. Stimson (Eds.), *Investigating Quality of Urban Life: Theory, Methods and Empirical Research.* Social Indicators Research Series, Volume 45, Springer, Dordrecht, pp. 185-208.

Thaler, R.H. & Sunstein, C. (2008). *Nudge: Improving Decisions About Health, Wealth, and Happiness*. New haven, Yale University Press.

van Praag, B. (2008). *Happiness Quantified: A Satisfaction Calculus Approach*. Oxford University Press.

von Wirth, T., Gret-Regamey, A. & Stauffacher, M. (2015). Mediating effects between objective and subjective indicators of urban quality of life: testing specific models for safety and access. *Social Indicators Research*, 122(1), 189-210.

Weiner, E. (2008). *The Geography of Bliss*, New York, Twelve (Hatchett Book Group).

Western, J., McCrea, R. & Stimson, R.J. (2007). Quality of life and social inclusion. *International Review of Sociology*, 17 (3), 523-537.

White, N.P. (Ed.) (2006). *A Brief History of Happiness*. Malden, MA., Blackwell Publishing.

Zehner, R. (1997). *Indicators of Quality of Life in New Communities*. Cambridge, MA, Ballinger Publishing Co.

Table captions

1 Comparison of different aspects of life satisfaction between Hong Kong, greater Detroit, and Brisbane

2 Differences in the mean scores of demographic and socio-economic groups on the satisfaction with *overall QOL* and for the three levels of *QOUL living domains*

3 Regression model: Role of individual assessment of satisfaction of *QOL life domain*s in explaining variation in survey respondent assessment of their *overall QOL* in Hong Kong

4 Regression model: Role of individual assessment of satisfaction of urban attributes for housing in explaining variation in survey respondent assessment of their housing QOUL living domain in Hong Kong

5 Regression model: Role of individual assessment of satisfaction of urban attributes for the neighbourhood in explaining variation in survey respondent assessment of their neighbourhood QOUL living domain in Hong Kong

6 Regression model: Role of individual assessment of satisfaction of urban attributes for the Hong Kong in explaining variation in survey respondent assessment of the Hong Kong as a whole QOUL living domain

Supplementary Table captions

S3 Correlation coefficient (Pearson's r) values between independent variables of *overall QOL* in Hong Kong

S4 Correlation coefficient (Pearson's r) values between independent variables of *housing QOUL living domain* in Hong Kong

S5 Correlation coefficient (Pearson's r) values between independent variables of *neigbourhood QOUL living domain* in Hong Kong

S6 Correlation coefficient (Pearson's r) values between independent variables of *Hong Kong as a whole QOUL living domain*

S7 Correlation coefficient (Pearson's r) values between dependent variables of different QOUL domains

Figure captions

1 A broad model framework for investigating subjective assessment of determinants of satisfaction with the residential environment. Source: adapted from Marans and Rodgers (1975) and Campbell et al. (1976a)

2 The location of respondents to the Hong Kong QOUL survey, 2015

3 Questions in the Hong Kong QOUL survey, 2015

4 People's subjective assessment of their *overall QOL* in Hong Kong

5 People's subjective assessment of their o*verall QOL* and set of *QOL life domain*s in Hong Kong

6 People's subjective assessment of their *overall QOL* in Hong Kong and their levels of satisfaction with three QOUL levels of living domains - housing, neighbourhood, and overall QOUL in Hong Kong as a whole

Table 1: Comparison between Hong Kong, greater Detroit, and Brisbane

	Percent of satisfaction% (overall mean score)		
	Hong Kong*	**Greater Detroit****	**Brisbane***
	Year 2015	**Year 2001**	**Year 2003**
Domain	**n=1169**	**n=4292**	**n=1374**
Current housing	51 (3.38)	n.a. (3.76)	85 (4.19)
Living in their neighbourhood	51 (3.58)	n.a. (3.80)	87 (4.10)
Living in the region	25 (2.90)	n.a. (3.67)	91 (4.10)
Overall quality of life	43 (3.29)	n.a. (3.96)	89 (4.20)
Friends/social	51 (3.45)	n.a. (3.84)	n.a. (4.26)
Standard of living	41 (3.25)	n.a. (3.84)	n.a. (4.07)
Family life	74 (3.84)	n.a. (3.83)	n.a. (4.24)
Health	49 (3.39)	n.a. (3.70)	n.a. (3.89)
Leisure	44 (3.31)	n.a. (3.69)	n.a. (3.88)
Job/school	39 (3.19)	n.a. (3.64)	n.a. (3.78)
The amount of free times	51 (3.39)	n.a. (3.06)	n.a. (3.29)
Financial	30 (3.06)	n.a. (n.a.)	n.a. (n.a.)
The amount of money	24 (2.81)	n.a. (n.a.)	n.a. (3.12)
Independence of freedom	58 (3.52)	n.a. (n.a.)	n.a. (4.20)

***** *The mean scores are based on a 5-point scale*
*** The mean scores have been standardized from a 7-point scale to a 5-point scale*

Table 2: Differences in the mean scores of demographic and socio-economic groups on the satisfaction with overall QOL and for the three levels of QOUL living domains

Demographic and socio-economic Groups	Mean score based on a 5-point Likert scale (Count)			
	Subjective assessment of overall QOL	Satisfaction with Current Housing	Satisfaction with Neighbour-hood	Satisfaction with Hong Kong as a Whole
Excellent	3.66 (50)	3.74 (50)	3.87 (47)	3.39 (44)
Very good	3.46 (332)	3.57 (328)	3.75 (319)	3.06 (315)
Fair	3.25 (607)	3.33 (588)	3.50 (581)	2.83 (564)
Not very good/poor	2.99 (147)	3.09 (146)	3.47 (139)	2.73 (139)
Very poor	2.67 (18)	2.67 (18)	3.53 (17)	2.56 (16)
< 200 feet^2	3.07 (40)	2.97 (37)	3.45 (38)	2.81 (31)
200-399 feet^2	3.07 (313)	3.00 (307)	3.47 (298)	2.75 (287)
400-599 feet^2	3.30 (399)	3.35 (391)	3.57 (377)	2.91 (374)
600-799 feet^2	3.39 (238)	3.67 (233)	3.70 (231)	2.96 (228)
800-999 feet^2	3.53 (85)	3.77 (83)	3.72 (81)	3.12 (82)
≥1,000 feet^2	3.59 (76)	3.95 (76)	3.72 (74)	3.09 (70)
Household gross monthly income	**	**	**	*
< HK$10,000	3.16 (94)	3.27 (92)	3.60 (86)	3.06 (78)
HK$10,000-$19,999	3.02 (183)	3.16 (178)	3.51 (176)	2.87 (170)
HK$20,000-$39,999	3.22 (348)	3.27 (340)	3.53 (335)	2.83 (331)
HK$40,000-$59,999	3.33 (239)	3.42 (238)	3.58 (231)	2.84 (224)
HK$60,000-$79,999	3.31 (96)	3.54 (95)	3.59 (92)	2.86 (91)
≥HK$80,000	3.73 (130)	3.80 (128)	3.77 (128)	3.06 (125)
No income/retired/supported	3.60 (50)	3.47 (47)	3.81 (42)	3.13 (46)
Age	**	**	*	**
18-24 years	3.18 (164)	3.26 (163)	3.57 (158)	2.85 (159)
25-44 years	3.18 (379)	3.25 (375)	3.53 (368)	2.75 (364)
45-64 years	3.33 (458)	3.47 (446)	3.59 (440)	2.92 (422)
65 years and over	3.55 (147)	3.56 (140)	3.73 (130)	3.36 (124)
Type of dwelling	**	**	**	
Public rental housing	3.09 (350)	3.09 (341)	3.50 (330)	2.88 (318)
Govt. subsidised sales flat	3.27 (241)	3.43 (236)	3.60 (231)	2.83 (225)
Private housing	3.44 (490)	3.55 (481)	3.65 (472)	2.97 (463)
Other	3.24 (68)	3.51 (67)	3.49 (65)	2.84 (64)
Engagement-in-work	**	**		**
Unemployed	3.11 (113)	3.29 (111)	3.62 (108)	2.79 (104)
Working part-time	3.17 (143)	3.20 (142)	3.51 (136)	2.84 (137)
Working full-time	3.27 (622)	3.36 (611)	3.56 (604)	2.83 (590)
Full-time home duties	3.28 (65)	3.45 (65)	3.53 (62)	2.89 (61)
Retired	3.53 (182)	3.59 (175)	3.68 (167)	3.25 (161)
Marital status	**	**		**
Single	3.15 (390)	3.22 (387)	3.53 (381)	2.80 (372)
Divorced/separated	3.33 (69)	3.38 (66)	3.59 (67)	2.91 (63)
Married/partner	3.35 (651)	3.46 (635)	3.61 (614)	2.94 (604)
Widowed	3.55 (33)	3.72 (32)	3.75 (32)	3.31 (26)

One-Way ANOVA: * significant at 95% confidence interval; ** significant at 99% confidence interval

Source: The authors.

Table 2 ***(continues…)***

Demographic and socio-economic Groups	Mean score based on a 5-point Likert scale (Count)			
	Subjective assessment of overall QOL	Satisfaction with Current Housing	Satisfaction with Neighbour-Hood	Satisfaction with Hong Kong as a Whole
Housing tenure	**	**	*	*
Provided/partially subsidised	3.62 (13)	3.69 (13)	3.54 (13)	3.17 (12)
Fully owned	3.45 (444)	3.50 (437)	3.64 (424)	3.00 (410)
Being paid-off	3.39 (271)	3.64 (265)	3.65 (259)	2.91 (264)
Rented	3.03 (405)	3.07 (397)	3.50 (387)	2.79 (375)
Housing costs as proportion of gross household monthly income	**	**	*	*
<30%	3.34 (726)	3.42 (714)	3.62 (701)	2.93 (680)
30-39%	3.23 (195)	3.39 (189)	3.53 (190)	2.83 (189)
≥40%	2.96 (107)	3.09 (105)	3.44 (102)	2.67 (99)
Occupational status	**	**		
Manager/administrator	3.43 (144)	3.57 (143)	3.67 (138)	2.88 (138)
Professional	3.36 (285)	3.47 (280)	3.62 (272)	2.92 (267)
Associate professional	3.15 (67)	3.18 (67)	3.48 (65)	2.78 (63)
Clerical support professional	3.20 (171)	3.31 (167)	3.58 (166)	2.85 (163)
Service/sales worker	3.16 (169)	3.29 (165)	3.56 (166)	2.92 (156)
Craft and related worker	3.54 (41)	3.53 (38)	3.74 (38)	3.26 (35)
Plant/machine operator & assembles	3.24 (34)	3.28 (32)	3.55 (33)	2.76 (33)
Elementary occupation	3.30 (57)	3.22 (55)	3.45 (51)	3.04 (54)
Birthplace				**
Hong Kong	3.29 (899)	3.38 (884)	3.58 (870)	2.84 (851)
Elsewhere	3.29 (251)	3.37 (242)	3.60 (228)	3.16 (220)
Number of persons in household (excluding domestic helpers)		*		
One	3.35 (74)	3.37 (73)	3.65 (71)	2.98 (66)
Two	3.32 (227)	3.48 (220)	3.68 (218)	2.91 (214)
Three	3.23 (310)	3.38 (305)	3.58 (298)	2.83 (289)
Four	3.33 (341)	3.40 (338)	3.54 (327)	2.93 (327)
Five	3.26 (110)	3.19 (106)	3.53 (102)	2.88 (102)
Six or more	3.14 (42)	3.09 (43)	3.50 (40)	2.75 (40)
Highest level of education				*
No schooling; Primary School	3.34 (47)	3.47 (45)	3.57 (37)	3.08 (38)
Lower secondary school	3.26 (150)	3.36 (143)	3.54 (141)	3.05 (137)
Upper secondary; Matriculation	3.28 (327)	3.37 (318)	3.54 (314)	2.92 (304)
Post-secondary; Bachelor's degree	3.27 (471)	3.36 (468)	3.62 (461)	2.86 (447)
Postgraduate	3.38 (151)	3.48 (149)	3.64 (143)	2.80 (143)
Gender				
Male	3.28 (509)	3.38 (494)	3.58 (485)	2.94 (465)
Female	3.29 (654)	3.38 (645)	3.6 (626)	2.86 (619)

One-Way ANOVA: * significant at 95% confidence interval; ** significant at 99% confidence interval

Source: The authors.

Table 3: Regression model: Role of individual assessment of satisfaction of *QOL life domains* in explaining variation in survey respondent assessment of their overall QOL in Hong Kong

Model		Unstandardized Coefficients β	Unstandardized Coefficients Std. Error	Standardized Coefficients β	t	Sig.
Constant		.288	.087		3.324	.001
a.	Overall standard of living***	.571	.026	.573	22.117	.000
b.	Employment status***	.077	.020	.086	3.903	.000
c.	Housing situation***	.108	.018	.134	6.071	.000
d.	Health status	-.009	.019	-.010	-.489	.625
e.	Relationships with family	.029	.020	.028	1.434	.152
f.	Financial situation***	.108	.026	.115	4.198	.000
g.	Social relationships	-.030	.023	-.030	-1.341	.180
h.	Leisure activity	.024	.022	.025	1.091	.276
i.	The amount of time you have to do the things you want to do	.010	.023	.013	.436	.663
j.	Your independence of freedom*	.046	.023	.058	1.968	.049
k.	The amount of money you have available to yourself personally	-.010	.019	-.013	-.529	.597

*** p<0.001; **p<0.01; *p<0.05
Dependent variable: Overall QOL
R=0.83; R square=0.689; Adjusted R square=0.685; Standard error of the estimate=0.450
(See also supplementary Table S3)

Table 4: Regression model: Role of individual assessment of satisfaction of urban attributes for housing in explaining variation in survey respondent assessment of their housing QOUL living domain in Hong Kong

Model	Unstandardized Coefficients β	Unstandardized Coefficients Std. Error	Standardized Coefficients β	t	Sig.
Constant	.374	.081		4.635	.000
a. Adequacy of rooms**	.093	.028	.116	3.317	.001
b. Current housing situation***	.216	.034	.245	6.393	.000
c. Affordability / Cost***	.095	.022	.098	4.243	.000
d. Humidity	-.001	.022	-.022	-.066	.947
e. Ventilation	.029	.026	.031	1.105	.269
f. Sunniness	-.007	.025	-.008	-.293	.770
g. Overall comfort level***	-455	.032	.435	14.201	.000

*** p<0.001; **p<0.01; *p<0.05
Dependent variable: Satisfaction with housing
R=.792; R square=.627; Adjusted R square=.625; Standard error of the estimate=.549
(See also supplementary Table S4)

Table 5: Regression model: Role of individual assessment of satisfaction of urban attributes for the neighbourhood in explaining variation in survey respondent assessment of their neighbourhood QOUL living domain in Hong Kong

Model	Unstandardized Coefficients β	Unstandardized Coefficients Std. Error	Standardized Coefficients β	t	Sig.
Constant	.687	.112		6.116	.000
a. Safety walking after dark***	.224	.030	.236	7.444	.000
b. Home safety**	.093	.030	.097	3.096	.002
c. Convenience to walk to stores, parks and other amenities***	.144	.022	.180	6.513	.000
d. Employment opportunity	.045	.023	.056	1.950	.051
e. Jobs local social workers are doing*	.060	.027	.072	2.227	.026
f. Performance of local councillors in terms of hearing voices of residents	.018	.021	.026	0.894	.371
g. Willingness of people to help each other***	.098	.023	.119	4.320	.000
h. Built density***	.152	.018	.219	8.240	.000

*** p<0.001; **p<0.01; *p<0.05
Dependent variable: Satisfaction with neighbourhood
R=0.606; R square=0.367; Adjusted R square=0.363; Standard error of the estimate=0.548
(See also supplementary Table S5)

Table 6: Regression model: Role of individual assessment of satisfaction of urban attributes for the Hong Kong in explaining variation in survey respondent assessment of the Hong Kong as a whole QOUL living domain

Model		Unstandardized Coefficients		Standardized Coefficients		
		β	Std. Error	β	t	Sig.
Constant		-.097	.107		-.904	.366
a.	Climate (e.g. sunshine and humidity)***	.249	.030	.237	8.322	.000
b.	Air quality**	.111	.034	.107	3.300	.001
c.	Noise pollution*	.090	.035	.079	2.597	.010
d.	Services and facilities **	.093	.029	.089	3.279	.001
e.	Social conditions	.068	.028	.067	2.443	.015
f.	Economic conditions***	.157	.028	.156	5.564	.000
g.	Cultural conditions***	.129	.027	.141	4.870	.000
h.	Natural environment**	-.084	.025	-.090	-3.382	.001
i.	Transportation**	.078	.029	.074	2.676	.008
j.	The provision of educational services**	.091	.030	.093	3.095	.002
k.	The provision of health services*	.062	.026	.065	2.341	.019

*** p<0.001; **p<0.01; *p<0.05
Dependent variable: Satisfaction with Hong Kong as a whole
R=0.637; R square=0.406; Adjusted R square=0.402; Standard error of the estimate=0.532
(See also supplementary Table S6)

Supplementary Table S3

Correlation coefficient (Pearson's r) values between independent variables of *overall QOL* in Hong Kong

	a. Overall standard of living	b. Employment status	c. Housing situation	d. Health status	e. Relationships with your family	f. Financial situation	g. Social relationships	h. Leisure Activity	i. The amount of time you have to do the things you want to do	j. Your independence or freedom	k. The amount of money you have available to yourself personally
a. Overall standard of living	1	.580**	.582**	.383**	.305**	.642**	.359**	.451**	.379**	.409**	.523**
b. Employment status	.580**	1	.431**	.372**	.272**	.538**	.336**	.359**	.278**	.334**	.415**
c. Housing situation	.582**	.431**	1	.340**	.299**	.509**	.261**	.355**	.411**	.412**	.412**
d. Health status	.383**	.372**	.340**	1	.339**	.394**	.341**	.384**	.288**	.332**	.331**
e. Relationships with your family	.305**	.272**	.299**	.339**	1	.335**	.366**	.306**	.272**	.351**	.248**
f. Finantial situation	.642**	.538**	.509**	.394**	.335**	1	.385**	.422**	.393**	.429**	.679**
g. Social relationships	.359**	.336**	.261**	.341**	.366**	.385**	1	.591**	.325**	.350**	.318**
h. Leisure Activity	.451**	.359**	.355**	.384**	.306**	.422**	.591**	1	.464**	.448**	.384**
i. The amount of time you have to do the things you want to do	.379**	.278**	.411**	.288**	.272**	.393**	.325**	.464**	1	.798**	.386**
j. Your independence or freedom	.409**	.334**	.412**	.332**	.351**	.429**	.350**	.448**	.798**	1	.401**

k. The amount of money you have available to yourself personally	.523**	.415**	.412**	.331**	.248**	.679**	.318**	.384**	.386**	.401**	1

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

Supplementary Table S4

Correlation coefficient (Pearson's r) values between independent variables of *housing QOUL living domain* in Hong Kong

	a. Adequacy of rooms	b. Current housing situation	c. Affordability cost	d. Humidity	e. Ventilation	f. Sunniness	g. Overall comfort level
a. Adequacy of rooms	1	.845**	.481**	.348**	.324**	.337**	.612**
b. Current housing situation	.845**	1	.550**	.363**	.368**	.388**	.681**
c. Affordability cost	.481**	.550**	1	.398**	.389**	.377**	.526**
d. Humidity	.348**	.363**	.398**	1	.530**	.490**	.488**
e. Ventilation	.324**	.368**	.389**	.530**	1	.712**	.604**
f. Sunniness	.337**	.388**	.377**	.490**	.712**	1	.602**
g. Overall comfort level	.612**	.681**	.526**	.488**	.604**	.602**	1

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

Supplementary Table S5

Correlation coefficient (Pearson's r) values between independent variables of *neigbourhood QOUL living domain* in Hong Kong

	a. Safety walking after dark	b. Home safety	c. Convenience to walk to stores, parks and other amenities	d. Employment opportunity	e. Jobs local social workers are doing	f. Performance of local councillors in terms hearing voices of residents	g. Willingness of people to help each other	h. Built density
a. Safety walking after dark	1	.644**	.375**	.196**	.212**	.154**	.180**	.243**
b. Home safety	.644**	1	.323**	.199**	.188**	.144**	.206**	.276**
c. Convenience to walk to stores, parks and other amenities	.375**	.323**	1	.336**	.387**	.205**	.201**	.108**
d. Employment opportunity	.196**	.199**	.336**	1	.528**	.360**	.290**	.169**
e. Jobs local social workers are doing	.212**	.188**	.387**	.528**	1	.547**	.365**	.233**
f. Performance of local councillors in terms hearing voices of residents	.154**	.144**	.205**	.360**	.547**	1	.397**	.280**
g. Willingness of people to help each other	.180**	.206**	.201**	.290**	.365**	.397**	1	.378**
h. Built density	.243**	.276**	.108**	.169**	.233**	.280**	.378**	1

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

Supplementary Table S6

Correlation coefficient (Pearson's r) values between independent variables of *Hong Kong as a whole QOUL living domain*

	a. Climate	b. Air quality	c. Noise pollution	d. Services and facilities	e. Social conditions	f. Economic conditions	g. Cultural environment	h. Natural environment	i. Transportation	j. The provision of educational services	k. The provision of health services
a. Climate	1	.584**	.502**	.326**	.347**	.365**	.338**	.351**	.327**	.354**	.354**
b. Air quality	.584**	1	.669**	.234**	.362**	.364**	.438**	.340**	.269**	.366**	.312**
c. Noise pollution	.502**	.669**	1	.249**	.374**	.305**	.375**	.328**	.241**	.319**	.301**
d. Services and facilities	.326**	.234**	.249**	1	.370**	.475**	.348**	.330**	.458**	.430**	.376**
e. Social conditions	.347**	.362**	.374**	.370**	1	.471**	.492**	.331**	.287**	.382**	.304**
f. Economic conditions	.365**	.364**	.305**	.475**	.471**	1	.485**	.356**	.388**	.390**	.390**
g. Cultural environment	.338**	.438**	.375**	.348**	.492**	.485**	1	.491**	.322**	.454**	.368**
h. Natural environment	.351**	.340**	.328**	.330**	.331**	.356**	.491**	1	.379**	.387**	.359**
i. Transportation	.327**	.269**	.241**	.458**	.287**	.388**	.322**	.379**	1	.529**	.477**
j. The provision of educational services	.354**	.366**	.319**	.430**	.382**	.390**	.454**	.387**	.529**	1	.576**
k. The provision of health services	.354**	.312**	.301**	.376**	.304**	.390**	.368**	.359**	.477**	.576**	1

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

Supplementary Table S7

Correlation coefficient (Pearson's r) values between dependent variables of different QOUL domains

	Overall QOL	Housing	Neighbourhood	Hong Kong as a whole
Overall QOL	1	.518**	.405**	.496**
Housing	.518**	1	.474**	.380**
Neighbourhood	.405**	.474**	1	.373**
Hong Kong as a whole	.496**	.380**	.373**	1

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

Figure 1

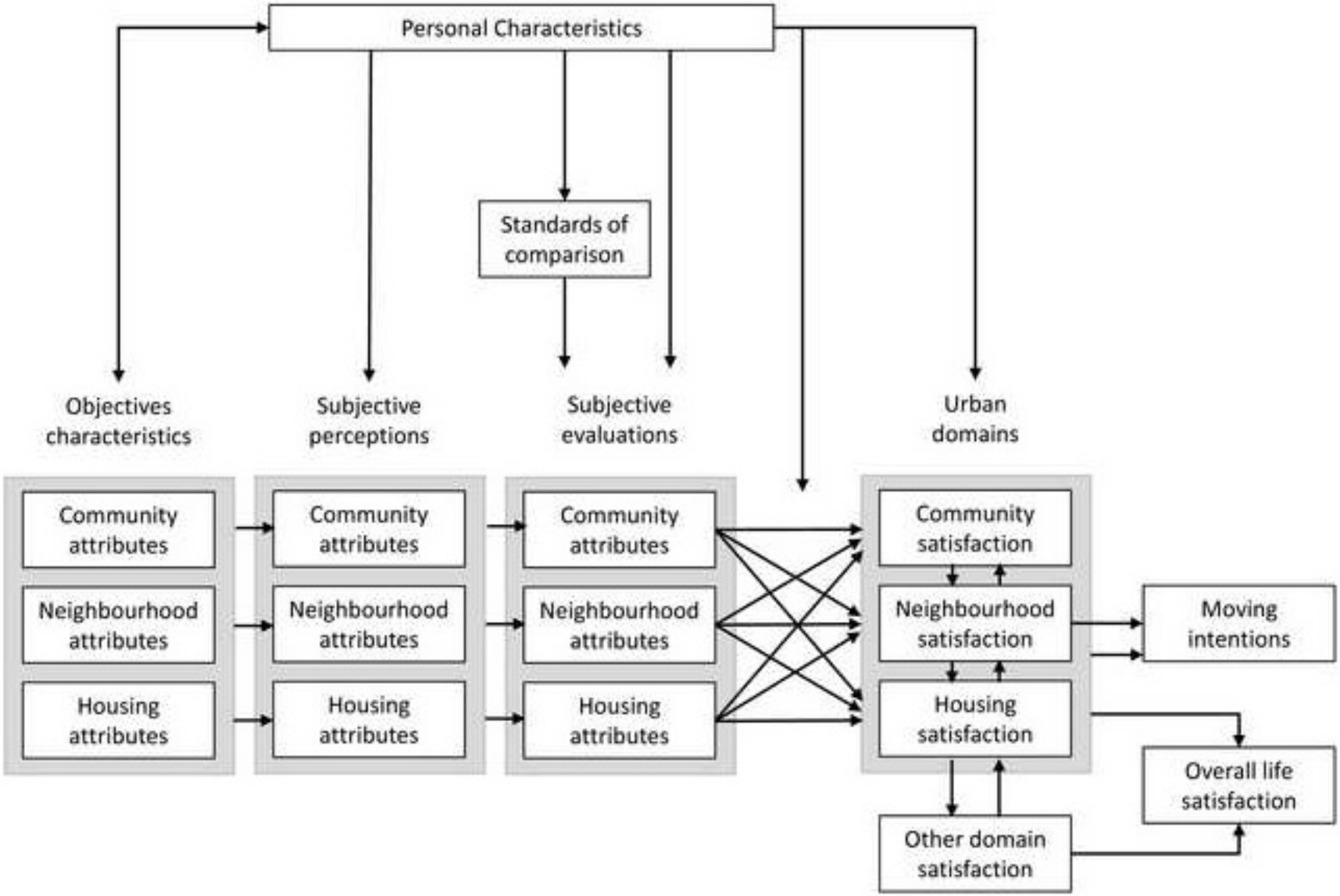

Personal Characteristics
Standards of comparison
Objectives characteristics
Subjective perceptions
Subjective evaluations
Urban domains
Community attributes
Neighbourhood attributes
Housing attributes
Community attributes
Neighbourhood attributes
Housing attributes
Community attributes
Neighbourhood attributes
Housing attributes
Community satisfaction
Neighbourhood satisfaction
Housing satisfaction
Moving intentions
Overall life satisfaction
Other domain satisfaction

Figure 2

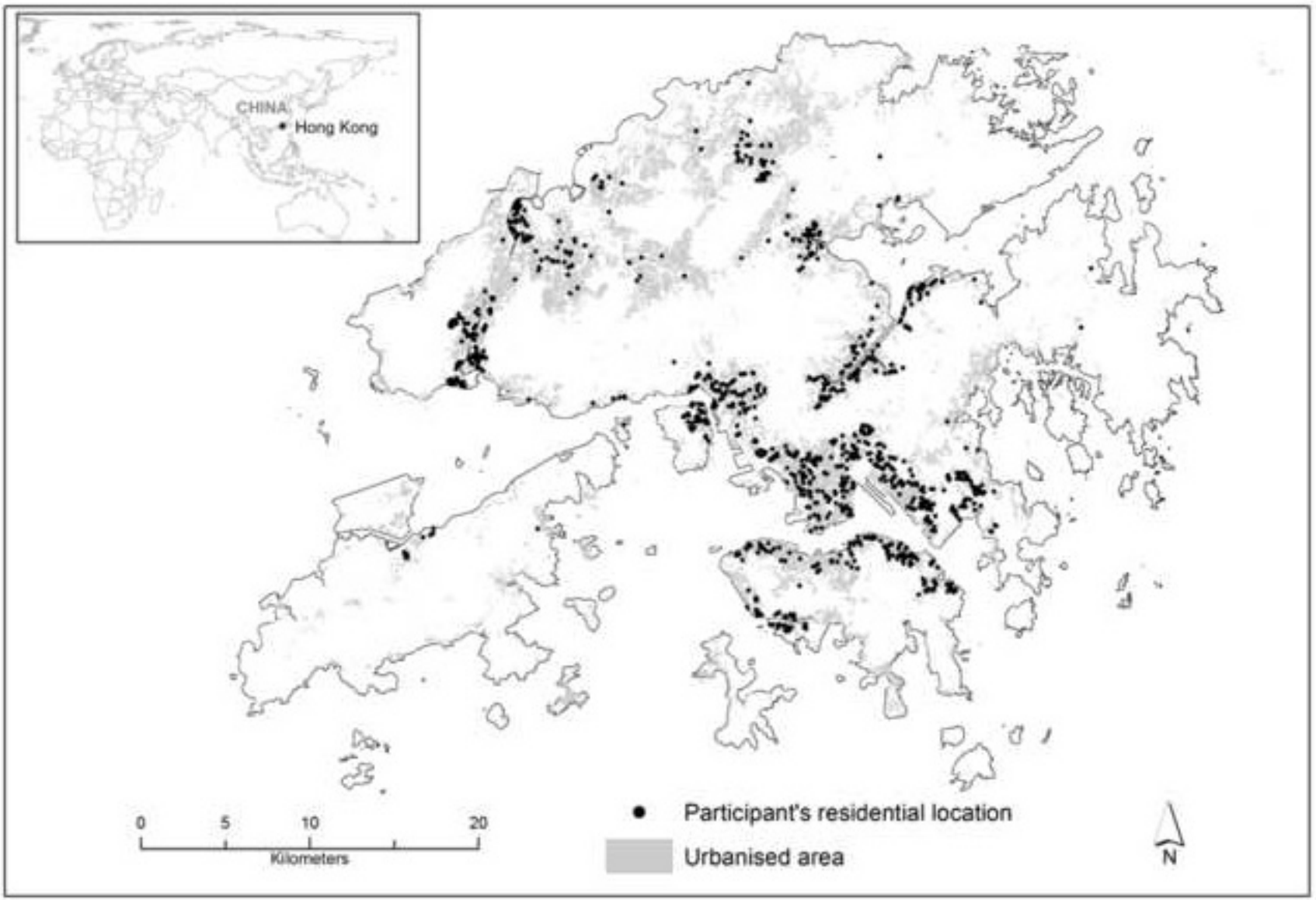

CHINA
Hong Kong
0
5
10
20
Kilometers
Participant's residential location
Urbanised area
N

Figure 3

PART A

11 QOL life domains

- overall standard of living
- employment status
- housing situation
- health status
- relationships with family
- financial situation
- social relationships
- leisure activities
- the amount of time to do the things you want
- independence or freedom
- the amount of money available to yourself personally

PART B

Social capital measures

Not discussed in this study

- disorientation
- feeling alone
- felt negative
- felt discriminated
- world falling apart
- wish to be important
- not able to tell right from wrong
- don't like rules
- no caring person
- depressed and don't know why
- past year activities
- interaction with family, friends, co-workers, neighbours
- trust of family, friends, co-workers, neighbours
- seek help from family, friends, co-workers, neighbours

PART C

Personal and family aspects

- gender
- age
- marital status
- birthplace
- number of persons in household (excluding domestic helper)
- type of dwelling
- size of dwelling
- housing tenure
- household gross monthly income
- housing cost (proportion of household gross monthly income)
- highest level of education
- engagement in work
- occupation status
- health status

3 levels of living domains

1 - Housing

- adequacy of rooms for your family
- housing situation meets family needs
- affordability of housing cost;
- humidity
- ventilation
- sunniness
- overall comport level

2 - Neighbourhood

- safety walking after dark
- breaking and entering
- convenience to walk to stores, parks, and other amenities
- employment opportunities
- jobs local social workers are doing
- performance of local councillors in terms of hearing voices of residents
- willingness of people to help each other
- build density

3 - Hong Kong as a whole

- climate
- air quality
- noise pollution
- services and facilities (retail, entertainment)
- social conditions
- economic conditions
- cultural environment
- natural environment
- transportation
- provision of educational facilities
- provision of health services

Figure 4

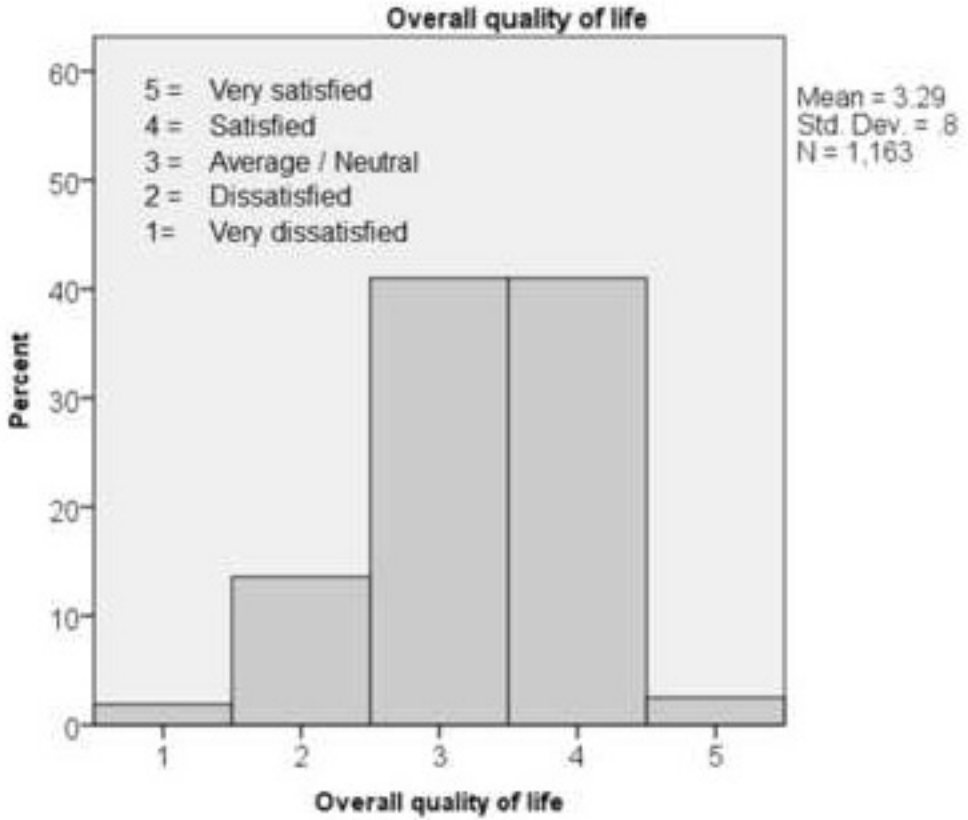

Overall quality of life
5 = Very satisfied
4 = Satisfied
3 = Average / Neutral
2 = Dissatisfied
1= Very dissatisfied
Mean = 3.29
Std. Dev. = .8
N = 1,163
Percent
60
50
40
30
20
10
0
1
2
3
4
5
Overall quality of life

Figure 5

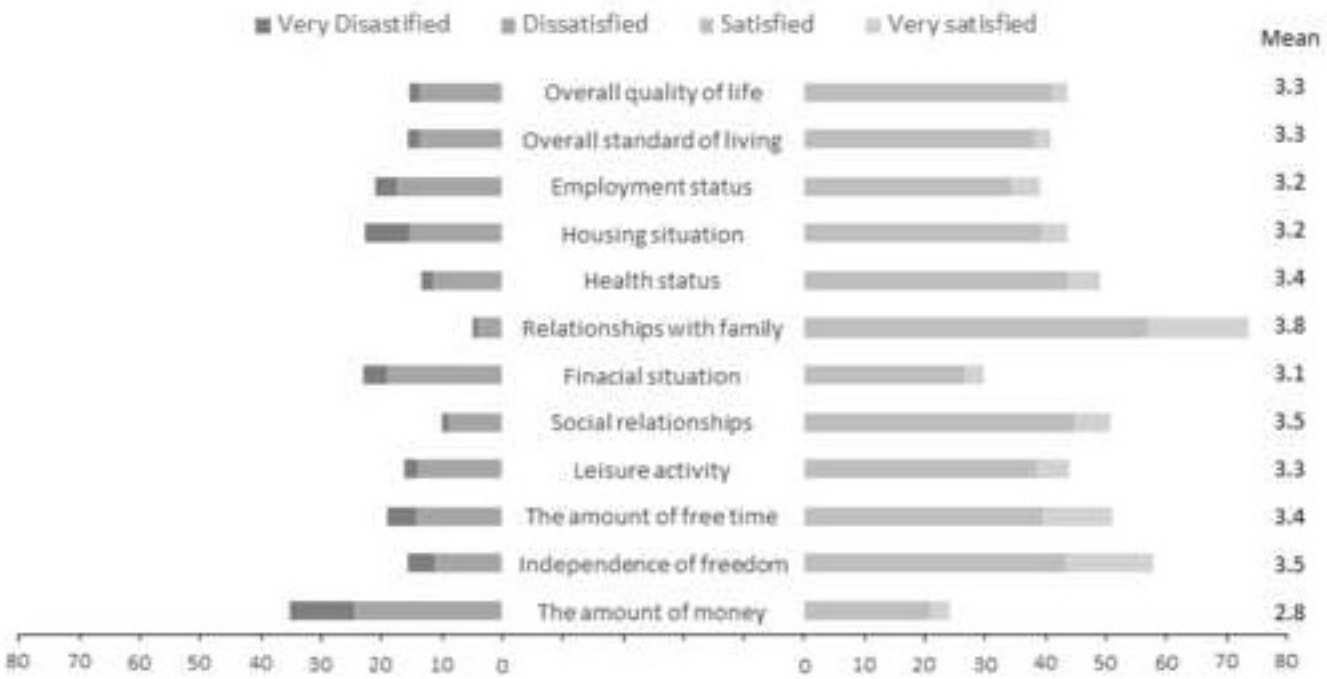
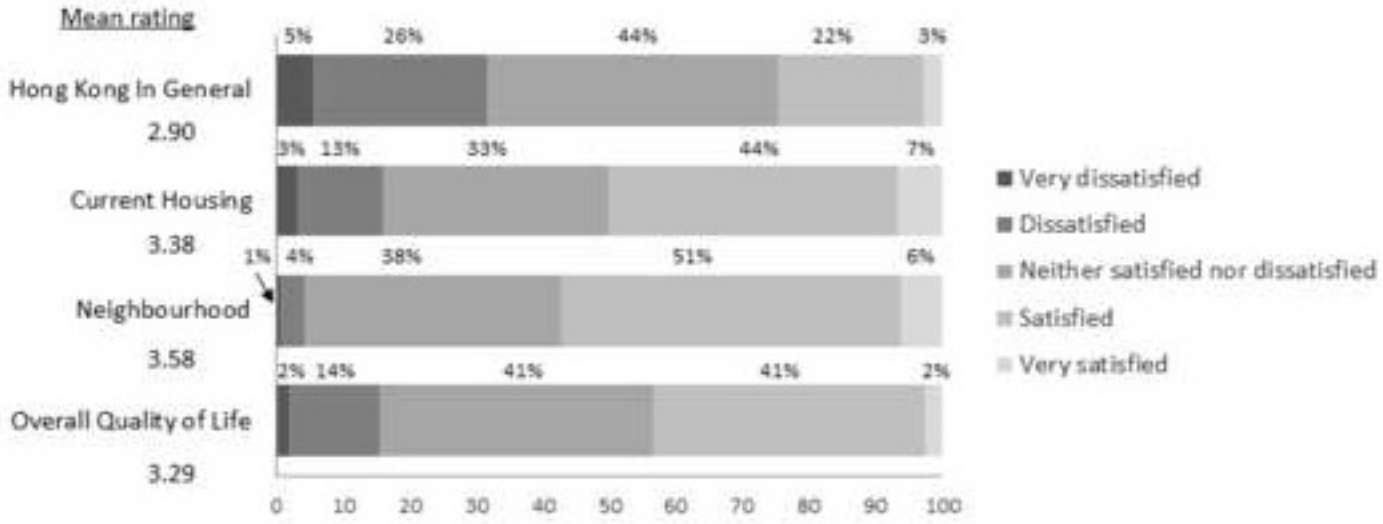

Very Disastified
Dissatisfied
Satisfied
Very satisfied
Mean
Overall quality of life
3.3
Overall standard of living
3.3
Employment status
3.2
Housing situation
3.2
Health status
3.4
Relationships with family
3.8
Finacial situation
3.1
Social relationships
3.5
Leisure activity
3.3
The amount of free time
3.4
Independence of freedom
3.5
The amount of money
2.8
80 70 60 50 40 30 20 10 0
0 10 20 30 40 50 60 70 80

Figure 6


Mean rating
Hong Kong In General
2.90
5%
26%
44%
22%
3%
Current Housing
3.38
3%
13%
33%
44%
7%
Neighbourhood
3.58
1%
4%
38%
51%
6%
Overall Quality of Life
3.29
2%
14%
41%
41%
2%
0
10
20
30
40
50
60
70
80
90
100
Very dissatisfied
Dissatisfied
Neither satisfied nor dissatisfied
Satisfied
Very satisfied