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A Capabilities Approach to Housing and Quality of Life: The Evidence from Germany

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A Capabilities Approach to Housing and Quality of Life: The Evidence from Germany

The capabilities approach developed by Sen (1985) and others has been highly influential in development circles and is increasingly being thought of as a theoretical framework suitable for understanding and measuring quality of life issues in high income contexts (Anand *et al* (2009), EU (2009)). In this paper, we contribute to a growing literature that draws on the approach to help understand connections between housing and quality of life. Specifically, we explore whether a broad range of capabilities and activities associated with housing have a detectable impact on housing satisfaction, and whether housing satisfaction contributes to overall life satisfaction. Our results indicate that housing satisfaction is indeed related to overall life satisfaction and that a wide range of different kinds of variables appear to impact housing satisfaction itself. The paper concludes by suggesting its findings underline the fact that a holistic view of housing policies needs to be taken if such policies are to make a full contribution to improved quality of life.

Keywords: housing satisfaction, capabilities approach, quality of life

1. Introduction

The capabilities approach developed by Sen (1985, 1992) and others, provides an alternative to standard income and expenditure measures by taking account of the heterogeneity of needs among individuals (Kuklys, 2005). This approach recognises the 'multidimensionality of social disadvantage' (Sen and Anand, 2003) and broadens the scope of poverty assessment. In addition, and perhaps most importantly of all, it explicitly recognises that people's opportunities, including life chances, may be quite different and in some cases for reasons that are not ethically warranted. Sen's original version of this approach also emphasises a connection between happiness and general activities (functionings), and in this respect, shares with research on social indicators and the economics of happiness, an interest in what is often variably referred to as life satisfaction, happiness or utility. Despite, the growth of interest in the capabilities approach as a way of structuring social science and policy analysis, there is relatively little substantial research that applies the capabilities approach to housing[1]. This is surprising in view of the fact that the neighbourhood in which a person lives and other characteristics of their housing are likely to be associated with their experienced quality of life as well as the opportunities a person has, objectively speaking.

In what follows, this omission is addressed by seeking to operationalise the capabilities approach in the field of housing research. This analysis is organised as follows. Section, 2 sets out the capabilities approach and discusses its relevance to housing. The operationalization of the capabilities follows by means of identifying those housing and neighbourhood-related social indicators that feed into a 'good life'. Said indicators draw on some of the themes set out in the literatures around housing, and life satisfaction more generally, and are used here to decompose housing satisfaction itself into its

[1] This is not to suggest that there is not a substantial body of literature in other fields and disciplines relating to satisfaction, housing and how people seek to fulfil their needs (see, for instance, Jansen, 2013; Clapham, 2005). There is also a well-developed literature around housing satisfaction, needs and preferences for those with disabilities (see, for instance, Elliott et al, 1990; AAPD, 2012)

component features, insofar as the data allows. On the basis of this analysis, four hypotheses around the type of variables that might impact on housing satisfaction are put forward (Section 3). To achieve this, their explanatory power is tested using data from the 2007 iteration of German Socio-Economic Panel (GSOEP) longitudinal survey whereby a series of sequential regressions are employed. These models take, in turn, self-reported well-being (SWB) and housing satisfaction as the dependent variables where the independent variables reflect key themes from the capabilities and housing literatures such as what a person can do and their opportunity sets (i.e. social interaction, community engagement, etc.). Section 4 reports the descriptive and analytical results of our analyses of these hypotheses using the aforementioned GSOEP survey data. Section 5 sets out the key conclusions of the preceding analysis and on this basis reflect on the usefulness of the capabilities approach for the analysis of housing issues.

2. Theory

2.1 The Capabilities Approach to Welfare

Sen's capabilities approach (1985) offers a constructive model for addressing some of the deficiencies inherent to traditional welfare economics (Anand et al, 2007). The most distinctive feature of this approach as a way of analysing welfare and social issues is the emphasis on opportunity and the distinction between what people are free to do (capabilities) and what they actually do (functionings). There is, therefore, potential for a significant connection to be made between housing and quality of life which the approach can help to draw out.

Sen's capabilities approach to the economics of welfare has, in its formal version, three basic relationships. The first holds that functionings - what a person does or is – depend on the resources at their command. A second relationship holds that these functionings are what cause a person to feel happy, or otherwise. And a third relationship, holds that a person's total opportunities depend on the set of all functionings they could choose, given the resources at their command, and their ability to convert resources into welfare outcomes. A number of approaches to connecting empirical work in this sphere[2] to capabilities theory exist with utility defined as the happiness derived from doing or being some set of 'things' where 'h is a happiness function related to 'functionings achieved', f is a function that maps goods characteristics into functionings achieved, and c is a function that maps the consumer's bundle of goods onto a vector of characteristics' (Anand et al, 2007, 2009; Sen, 1985)[3].

$$u \approx h(f(c(x)) \qquad (1)$$

The capabilities approach draws upon the distinction between those functionings achieved (what a person does) and a person's capabilities where the latter is some set of those functionings that it is possible for a person to achieve. In his original writings, Sen put forward the concept of the set 'Q' (see 2 below) where this set of feasible functions was dependent on both a person's own

[2]Such as testing whether specified capabilities are related to SWB and/or whether variances exist between individuals or groups in their perceptions of their capabilities

[3] For the purposes of the empirical work presented below, these equations can be interpreted as those functionings achieved in the house (or home) and those freedoms and opportunities afforded by the home and neighbourhood in terms of access to services, employment opportunities, social interaction and community engagement

characteristics and their entitlements, opportunities and resources. The consequent empirical approach to modelling SWB as a function of an individual's freedoms then, as put forward by Anand and others, involves the following estimation (see 3 below) with 'g' as a happiness function[4]. A graphical representation (or path diagrams) of these hypothesised relationships, in the context of this research, is presented in Figure 1.

$$Q \approx \{ f(c(x)) \} \quad (2)$$

$$SWB \approx g(Q) \quad (3)$$

Figure 1 here.

So there are already some obvious potential links between the capabilities approach and housing, broadly conceived, and we can therefore ask whether it is possible to think more broadly and systematically (theoretically) about housing and the capabilities that people have. If we apply this kind of thinking to housing, what emerges? One idea is that satisfaction with housing depends on a variety of factors. Housing fundamentally enables people to engage in a variety of social, economic and physical functionings (doings or beings) and these can be constrained by housing which is inappropriate. So in Section 3 of this article, we adopt a social indicators approach to the decomposition of housing satisfaction into a variety of underlying factors and in so doing, propose four hypothesis sets relating to variables that measure the opportunities and functionings (or some combination thereof) that could plausibly affect the extent to which people are happy with where they live.

2.2 Housing and the Capabilities Approach

There is a clear and inherent interaction between the capabilities approach to welfare and the importance of housing. Sen's approach emphasises the importance functionings (what a person does) and capabilities (what a person could achieve) where the freedom to achieve well-being is central. These capabilities reflect 'the person's freedom to lead one type of life or another' (Sen, 1992) and will include many states such as the ability to be adequately nourished and to live in decent accommodation. In previous writings, Sen has referred to survival as the ultimate functioning and the one from which all others flow. This theoretical perspective implies that human survival is critically dependent upon access to safe and adequate shelter, although this is not the only role which shelter plays (Volkert, 2006). The capability to be protected from dangers to one's health is directly dependent upon the standard of one's housing (e.g. leaking roofs, insufficient heating, etc.) but the adequacy of housing also relates to other capabilities such as the ability to live without shame and to meet friends without losing self-respect.

[4]In this context, happiness overlaps with terms such as SWB or life satisfaction and the dataset used here posits a standard survey question with regard to life satisfaction requiring an evaluative judgement with regard to the latter ('satisfaction with life today'). Sen has also defined a function relating to the value of wellbeing ('v') that a person attaches to their functioning state: $v \approx h'(f(c(x)))$ and it has been suggested that it is possible to estimate the function $v \approx h''(Q)$, allowing 'for the possibility that people might, say, have high levels of functioning, objectively speaking, and yet not place much value on them' (Anand et al, 2007, 2009).

Recent research on well-being has underlined the importance of wider social indicators such as health outcomes, education levels and employment status and has examined the impact of these indicators upon life satisfaction and happiness. There has been a growing interest in the development of some broader definition of well-being reflecting those attributes and measures that are important to individuals such as control, enjoyment, security, belonging and attachment (Coast et al, 2006; Dolan et al 2008). This can also be seen in an increased interest in what is sometimes termed the 'economics of happiness' reflected in the burgeoning literature in this field. According to Dolan et al, the evidence indicates that 'poor health, separation, unemployment and lack of social contact are all strongly negatively associated with self-reported well-being (SWB)'. Housing is another such useful indicator we believe that the exploration of the importance of this variable will improve our understanding of well-being and those factors which shape life satisfaction albeit it is clear that the scope of our conceptualisation of housing, and its meaning, is an important consideration. Indeed, the available literature suggests that housing satisfaction is a dynamic and fluid concept which is also multi-tiered. At its most basic level, housing satisfaction is a function of housing quality and suitability (or the physical characteristics of a unit and general housing conditions) and this relationship is amply borne out in the international literature; for instance, research in the US has identified a relationship between the structural features of dwellings and physical amenities and housing satisfaction (James, 2007). These results are consistent with research by Diaz-Serrano (2006; 2009) who had previously noted that dwelling deficiencies such as inadequate space and heating exert a negative effect on housing satisfaction.

Housing, however, should not be conceptualised purely in terms of bricks and mortar, physical accommodation because housing (and homeownership) is interwoven with self-esteem and a sense of control (Rohe and Stegman, 1994) and can also play an important role by means of fulfilling expectations and conferring status. For most people, housing is of an order of importance exceeding many other issues given that housing consumption translates into the formation of a home. It is in the home that one finds refuge, rest and satisfaction (Sirgy and Cornwell, 2002) and builds personal and familial relationships. Easthope (2004) has observed that the personalisation of one's home promotes security and identity whilst Gurney (2000) has referred to the home as an 'emotional warehouse'. The effect of these emotional and psychological attachments to one's home can be seen in people's economic behaviour. In this respect, people do not always act as rational economic actors but rather, their economic decisions can be influenced by other factors such as their attachment to and satisfaction with the home and neighbourhood. For example, this can be seen in the expenditure incurred as people seek to personalise their home. Moreover, the fact that people can and do make economic decisions based upon their perceptions of the nature of place impacts upon house prices, homeownership rates and the success or failure of regeneration projects. Indeed, this importance of the difference between reality and expectations in determining housing satisfaction is a recurrent theme in the readings. Galster (1987) conceptualizes housing satisfaction as a variable reflecting the gap between households actual and desired housing situation. This conceptualization locates aspirations and expectations at the heart of housing satisfaction, particular with regard to the importance of tenure. Given that many governments and some researchers assume that homeownership is the desired or aspired – or even natural – form of housing situation (Saunders, 1990), this 'aspirational' conceptualization of housing satisfaction implies that tenure is a key factor in determining housing satisfaction. In this regard, homeownership can be said to represent expectations fulfilled and to confer status.

Dwellings are located in neighbourhoods and individuals interact not only with the other members of their household but also with the community living in their neighbourhood. The neighbourhood and community, therefore, also impact on satisfaction with one's house and home. Vemuri and Costanza (2006) found that natural capital – including green spaces – has a unique relationship with life satisfaction. Kearney (2006) has identified the provision of shared and natural spaces as promoting better neighbour relations and higher neighbourhood satisfaction as well as reducing perceptions of overcrowding and high densities. One's feelings with regard to house and home are inextricably tied into the broader concepts of community and neighbourhood for a variety of reasons, both economic and social. A number of studies have found that neighbourhoods, housing and life satisfaction are positively correlated (Prezza and Constantini, 1998; Parkes et al, 2002) and have noted that factors such as crime and unfriendly neighbours do exert a negative influence on neighbourhood satisfaction. Similarly, a number of studies have also noted the need to build relationships within communities over time and the importance of a sense of belonging, local safety, access to services and facilities and neighbour interaction in this regard (Lee and Guest, 1984; Ng et al, 2005; European Urban Knowledge Network (2010)).

2.3 Determinants of Housing Satisfaction: Dwelling Characteristics, Ownership and Financial Status

Beyond the importance of factors such as safe shelter and running water, the fundamental importance of good quality housing is clear when one considers that the 'home' is a central location for social life as well, ideally, as a place of refuge. For instance, past research has identified a significant relationship between housing conditions, self-esteem, life satisfaction and what people can do in their day-to-day lives for all households (Volkert (2006); Oswald (2003); Rohe and Stegman (1994); Peck and Stewart (1984); Carp (1975)) whilst the importance of housing in the process of shaping welfare outcomes through its role in everyday life has also been noted (Ronald (2007); Kemeny (2001)). Diaz-Serrano (2006) has noted that dwelling deficiencies – shortage of space, rot, leaky roofs, inadequate heating, insufficient light – have been shown to exert a negative effect on housing satisfaction. It is important to note that such physical issues can have negative medical consequences but they may also have profound impacts on a person's social opportunities if, for example, accommodation inhibits people from socialising with friends at home.

Homeownership is, for example, often felt to give people a greater sense of control over housing in that they have more control over factors ranging from who enters their property to choice of décor compared to renters. By extension, this may bestow a greater sense of control over life more generally and a greater sense of self-worth (Easthope (2004); Rohe and Stegman (1994); Rosenberg (1979); Rakoff (1977); Porteous (1976)). Saunders (1990) notes that homeownership is believed to make a major contribution to one's overall life satisfaction by conferring a higher social status (i.e. that 'one has made it') and acts as an effective means of communicating this status whilst Rohe and Stegman (1994) found that 'ownership had the strongest association with life satisfaction…it was more important than the other demographic variables in the equation'. This relationship is re-affirmed by more recent research in this field. According to Diaz-Serrano and Stoyanova (2009) 'renters who become homeowners not only experience a significant increase in housing satisfaction, but also after changing their tenure status, they obtain a different utility from the same housing context'.

Housing costs are generally the largest single outlay facing any household and one that therefore both shapes a household's non-housing consumption opportunities and provides the principal mechanism for the accumulation of equity over a lifetime (Malpass, 2005). 'For most individuals, housing is the largest consumption and investment item of their lifetime and, as a result, housing satisfaction is an important component of their quality of life' (Vera-Toscano and Ateca-Amestoy, 2008). As a result, it is reasonable to hypothesise that the cost of housing – and the financial stress that this may impose – is an important determinant of both housing satisfaction as well as satisfaction with life in general. For instance, a recent examination of US subsidised rental programmes by James (2008) found that 'subsidised renters report higher satisfaction with their housing unit than do similarly situated non-subsidised renters'. Indeed, the international literature on this issue also makes clear the role the 'housing career'. Over the course of this career, households are conceived of as planning their housing choices – both a consumption and an investment decision – in such a way as to maximise their welfare. In doing so, households make choices with regard to cost, tenure, location and quality over the lifecycle. According to Nordvik (2001) '…a choice of a housing unit today affects tomorrow's opportunities and that households take account of this when making their choices'.

2.4 Determinants of Housing Satisfaction: Neighbourhood Quality, Access to Services and Social Engagement

Satisfaction with one's neighbourhood is determined by both the quality of surrounding houses and the neighbourhood features (i.e. the provision of services, public safety and green spaces) provided. Indeed, van Kamp et al (2003) have noted that both objective and subjective indicators are required to better understand the relationship between a person and his/her local environment and that 'a multidisciplinary framework of environmental quality and quality of life is required'. The importance of neighbourhood quality is under-scored in recent research by Sirgy, Gao and Young (2008); 'satisfaction with a variety of community services (e.g., services related to housing, education, government, healthcare, employment, religion, public safety, retailing, transportation, and leisure) affect satisfaction with the community and life overall through satisfaction in a variety of life domains (e.g., family, social, leisure, health, financial, cultural, consumer, work, spiritual, and environmental domains)'.

Indeed, van de Kamp (2010) has noted that the vitality of a neighbourhood relates to the 'variety of ways in which people live, work and reside there' whilst the European Urban Knowledge Network (2010) has noted the importance of the livability of neighborhoods where this concept is defined as 'the degree in which the environment in the neighbourhood connects to the conditions and needs of the inhabitants. Safety, social cohesion, facilities, integration and other such subjects are of importance for the liveability in neighbourhoods'. Interestingly, this research found that cleanliness, safety and tranquillity are of key interest for residents – with a particular emphasis on safety in the case of those living in disadvantaged communities – and that the social environment (i.e. social cohesion and the norms regarding neighbourhood behaviour) are also important considerations. Finally, the importance of such social engagement has been noted by Dolan et al (2008) where the latter noted the importance of social contact for self-reported well-being (SWB).

3. Hypotheses and Data

3.1 Hypotheses and Indicator Sets

At the outset, it is hypothesised that SWB is a function of satisfaction with a wide variety of life sub-

domains, including housing satisfaction and thereafter, it is hypothesised that housing satisfaction itself, in turn, is influenced by a number of 'indicator sets' (or Q). Based on the preceding review of research concerning housing and quality of life, we have identified the following four clusters of independent variables likely to impact housing satisfaction: (1) dwelling characteristics; (2) ownership and financial status; (3) neighbourhood quality and access to services; and (4) local activities, participation and social engagement. Below we outline how these factors relate to a capabilities approach to quality of life and why they might be determinants of housing satisfaction. Further path diagrams, hypothesising the relationship between capabilities (covariates) and SWB through housing satisfaction, are put forward in Figures 2 and 3.

Figures 2 and 3 here.

The first set of hypotheses relates to dwelling characteristics and it is hypothesised that the quality of a person's housing is an important predictor of housing satisfaction. When considering the determinants of housing satisfaction, it is clear at the outset that 'dwelling characteristics' must play an important causal role and that the conditions of a given housing unit – and the facilities offered (i.e. running water, central heating, garden, etc.) – cannot be underestimated when addressing the issue of what makes people satisfied with their accommodation. Secondly, it is hypothesised that factors pertaining to the cost associated with accommodation and housing tenure are further important predictors of housing satisfaction. The concepts of opportunity and autonomy are central and strongly linked within the capabilities approach, a point that raises the possibility that control over one's home might also be related to housing satisfaction. It is widely believed that homeownership can play an important role in shaping housing satisfaction.

Thirdly, it is hypothesised that factors pertaining to the quality of the local neighbourhood and access to services are further important predictors of housing satisfaction. Housing-related considerations do not exist in a social vacuum and, therefore, community and neighbourhood characteristics are likely to have a significant impact on housing satisfaction. Our fourth and final set of hypotheses concerns engagement in local activities which are normally best classified as functionings within in the capabilities approach. For the purposes of this paper, we have sought to explore social engagement from the perspective of the type (and extent) of the local activities undertaken by the respondent. This allows us to explore the importance of what the respondent does within the context of their community and by extension, provides further insights with regard to the importance of the availability of local facilities.

In each of the four areas above, we believe there are reasons to hypothesise a link between aspects of housing, housing satisfaction and life satisfaction. These four groups provide a theoretical framework for understanding the relations between housing and quality of life in which dwelling characteristics, ownership status and finance, neighbourhood quality and access to services and locally-based activities are highlighted.

3.2 Data

The analysis described here was undertaken using data from the German Socio-Economic Panel for

2007[5] which has an accessible set of variables that are closely related to our theoretical interests. This data provides a useful opportunity to explore the component elements of subjective well-being (Anand and Clarke, 2006). This survey is a representative longitudinal study of private households in the (former) Federal Republic of Germany and by 2007; it covered approximately 12,000 households and more than 20,000 adult persons. The unit of analysis used here is the individual respondent but additionally draws on household variables that have been merged into our dataset. In terms of subjective measures of well-being, the survey captures data across a range of satisfaction variables for each individual respondent. Each respondent is required to give a numerical evaluation[6] of his/her satisfaction across 11 separate domains including satisfaction with health, work, housing and leisure time. The survey also contains a measure of life satisfaction ('general satisfaction with life today') which is similar to that used in surveys such as the British Household Panel Survey and is posed at the end of the survey which implies that this is the opinion 'that arguably most closely satisfies the concept of reflection consistency' (Anand et al, 2005).

The survey also provides information regarding other characteristics that are relevant to this paper including an assessment of the quality and type of accommodation inhabited, the facilities available in the accommodation (i.e. storage, running water, etc.) and the cost associated with the accommodation. The author has also selected a series of variables which measure functionings (or what a person does)[7]. Alternatively, other variables which can act as proxies for functionings are also employed, where appropriate[8]. Such measures are useful as they allow us to focus upon the availability of substantive freedoms (or what people can actually chose to do) across a range of themes including social interaction and community engagement. Indeed, such questions allow us to view poverty as multi-dimensional in nature and to consider poverty as an expression of capability deprivation. The functionings chosen from the survey, albeit limited, do provide insights into what the respondents actually do in spheres such as social interaction within the neighbourhood (to invite friends to dinner, to worry about crime) and community engagement (to volunteer, to socialize).

3.3 Specifying a Model

Given the foregoing, we seek to understand the relationship between housing satisfaction and subjective well-being using a regression model approach that allows the influence of a variety of factors to be studied at the same time. This is done by estimating a model of housing satisfaction where the dependent variable (subjective housing satisfaction) is a function of a series of dependent variables as outlined above. This is estimated from the data using the OLS approach and the estimation model may be written as:

[5] The authors also estimated similar models using data for 2000 and 2004; the results of these regressions did not differ significantly from the results presented here

[6] Based upon a Likhert Scale where 0=low and 10=high

[7] A total of 27 dummy variables were created to reflect those facilities that a respondent has and/or what he or she can do. For instance, responses 'yes' and 'no' re: the presence of hot water were coded 1 and 0, respectively. Similarly, the responses 'once per month' or 'less than once per month' re: attendance at artistic/cultural events were coded 1 whilst 'never' was coded 0. In some cases, no data was provided on the survey. For example, on the questions pertaining to the presence of hot water and membership of an environmental interest group, 'No Answer' was entered in 66 (0.3%) and 541(2.6%) of cases, respectively.

[8] Some of the variables mentioned in the literature review, such place attachment, do not have good corresponding variables in the dataset. Some other themes, such as community engagement, and the availability of local activities, required the derivation of useful proxies (i.e. attendance at artistic events)

$$y = a + b_1 x_1 + ... + b_k x_k + \varepsilon$$

where $x_1,...x_k$ are the values of the regressor variables, $b_1,...b_k$ are the corresponding coefficients to be estimated, ε is a normally distributed error term, and y is the dependent variable.

We will use two versions of this general model, one in which housing satisfaction depends on the variables identified above and a second in which life satisfaction depends on housing satisfaction. The first model will provide evidence for or against our theoretical above whilst the second model will provide an indicator of the contribution of housing satisfaction to overall life satisfaction (or happiness).

4. Descriptive Results and Model Estimations

4.1 Relating Life Satisfaction to Housing Satisfaction

The distribution of both life satisfaction and housing satisfaction is shown by Figure 1 below. Table 1 indicates that the mean housing satisfaction was 7.7 with a standard deviation of 1.9. In other words, 68 per cent of all survey respondents reported a level of housing satisfaction of between 5.8 and 9.6 on a Likhert scale. The level of correlation between these two variables is less than 0.40[9] and remains unchanged when movements in the other 10 sub-domains are controlled for[10].

Figure 4 and Tables 1 and 2 here.

The results of the multiple regression analysis are presented in Table 3. This analysis takes life satisfaction as the dependent variable and explores whether the latter is a function of a set of nine satisfaction variables[11] – across a series of life domains (including housing, health and income) and including a series of socio-demographic controls – in order to test the basic hypothesis about the contribution of housing satisfaction to overall SWB. The results of this analysis indicate that each of these variables is significant at the 5 per cent level. Moreover, the analysis also shows that whilst the remaining variables are positively related to life satisfaction, this relationship is strongest with regard to satisfaction with health. This is important when one considers that access to good quality housing can play an important role in shaping a person's health. The analysis undertaken demonstrates that satisfaction with housing is a statistically significant component of broader life satisfaction and is therefore worthy of further investigation.

Table 3 here.

4.2 The Co-variates of Housing Satisfaction: Dwelling Characteristic Indicators

The analysis commences with a model which only considers the relationship between housing satisfaction and the physical attributes of the actual dwelling. The latter are captured using a set of 11

[9] Descriptive statistics, including bivariate correlations, are presented in Tables 1 and 2

[10] The latter refers to the results of a supplementary pairwise correlation

[11] This relates to the results of a backward elimination exercise whereby the least significant variables were excluded and the model re-estimated until all independent variables were statistically significant at the 5 per cent level (restricted model). The variables 'satisfaction with housework' and 'satisfaction with childcare' are both dropped here. A similar approach is used for the purposes of Table 8b

indicators denoting the characteristics of each dwelling including objective measures of the available facilities (i.e. garden, storage) and subjective assessments of conditions and space. In the first iteration of the model, nine of these variables had coefficients that were statistically significant at the 5 per cent level. As expected, those variables pertaining to a respondent's subjective assessment of condition and space are positively related to the reported level of housing satisfaction though the presence of a kitchen and an indoor toilet are negatively related to the reported level of housing satisfaction. This latter finding, however, may reflect the impact of habituation whereby respondents expect that such basic facilities will be provided and consequently, do not attach any significant value to them[12]. In a second version of the model, a variable denoting gender has been added. There is no discernible change to the results of the analysis as a result suggesting that these findings apply equally to men and women.

In the third version of the model, a variable relating to the respondent's age is added to the equation. There is an unexpected and important change regarding the presence of running water and storage as these variables now become statistically insignificant, a change that may reflect changing household composition over time (i.e. children leaving home) and a concomitant reduction in the need for storage space. There is also an important change in the coefficient related to a respondent's subjective assessment of condition and space; these now become less positive and this change may reflect a reduced capacity to finance housing upgrades or repairs as a person ages. Interestingly, the reverse of this phenomenon arises in the case of the variable denoting heating and solar energy; the coefficient of these variables becomes more positive and this could conceivably relate to the issue of fuel poverty amongst older persons. The introduction of a variable denoting German nationality in the next iteration of the model has only a minimal impact and therefore hints that results in other similar high-income European countries might not be so different.

In a fifth version of the model, the addition of a variable relating to tenure of the respondent's residence causes a series of variables to become statistically insignificant; in addition to the indoor toilet and kitchen, the presence of running water, a bathroom, storage space and solar energy have now become insignificant. Moreover, the coefficients of the remaining variables in the model also become less positive. This rather suggests that tenure is linked to the possession of these attributes but it is difficult to say from the results, or theory, whether tenure or dwelling characteristics are ultimately driving housing satisfaction. Finally, a sixth version of the model introduces all of the control variables listed above. In this model, six of the initial variables are statistically significant and the coefficient of each of these variables is positive: the respondent's subjective assessment of condition and space in addition to the presence of heating, a terrace, a garden and solar energy.

Figure 5 and Table 4 here.

4.3 The Co-variates of Housing Satisfaction: Ownership and Financial Status Indicators

We now turn to the results of a regression model in which ownership and financial status are key. The analysis commences with a model which only considers housing satisfaction as a function of a

[12] Only a very small proportion of respondents (with a response) reported the absence of these two facilities. In some cases, no data was reported on the survey instrument. The reference to habituation and expectations above is only one possible interpretation and it is, of course, possible to hypothesise a number of other plausible, alternative explanations. For instance, some persons may choose to live in a relatively primitive dwelling in remote rural surroundings

set of seven ownership and financial factors including the nature of the ownership of the property (i.e. privately owned, Government-owned, etc.), whether the property is Government subsidized and the monthly rent/mortgage. In the first version, six of these variables had coefficients that were statistically significant at the 5 per cent level and only ownership by a co-operative was statistically insignificant. Government subsidization of a property is negatively correlated with housing satisfaction, a result that is not unanticipated given that German authorities intervene in the housing market to subsidise households through the provision of a housing benefit to those with low incomes (indeed research from across Europe indicates that poorer households tend to occupy lower quality accommodation (Fack, 2006)).

Moreover, private ownership of a property was negatively correlated with housing satisfaction. Given that much of the available literature assumes that homeownership is the desired or aspired housing situation, this result may appear to be counter-intuitive. However, it is in fact consistent with Oswald et al (2003) whose research found that whilst housing tenure was indeed an important predictor for well-being, it was tenants who were more satisfied by comparison with owner-occupiers. In this case, the authors speculated that this result may be due to the fact that tenants are not responsible for maintaining and fixing a dwelling or because they just perceive greater freedom to leave whenever they want. Subsequently, variables relating to the respondent's gender, age, nationality and tenure were added to the model but produced no discernible change to the results of the analysis – again indicating an element of robustness in the empirical findings.

Table 5 here.

4.4 The Co-variates of Housing Satisfaction: Neighbourhood Quality and Social Interaction Indicators

The analysis commences with a model which only considers the relationship between housing satisfaction and a set of four indicators relating to the quality of a neighbourhood where the latter is specifically concerned with social interaction within one's own neighbourhood and the livability of that neighbourhood (i.e. safety, social cohesion, etc.). In this first iteration of the model, four of these variables had coefficients that were statistically significant at the 5 per cent level; the variable denoting anxiety relating to crime was not significant. As might be expected, a variable pertaining to a respondent's subjective assessment of quality of their own neighbourhood was statistically significant and demonstrated a strongly positive correlation to housing satisfaction. Similarly, a propensity to invite friends to one's own home to dine was also positively correlated with housing satisfaction. By contrast, being gainfully employed was negatively correlated with housing satisfaction in this model. This may indicate a problem with regards to the availability of desirable employment opportunities in certain neighbourhoods and/or some requirement to travel beyond one's own neighbourhood in order to take up employment. As before, there is no discernible change to the results of the analysis as a result of the introduction of the respondent's gender.

When the respondent's age is added to the equation, being gainfully employed becomes positively correlated with housing satisfaction. This is an interesting development and may reflect changing expectations and needs as a person ages - with younger respondents being more flexible, whilst older respondents are less willing to travel. Interestingly, the propensity to worry about crime remains statistically insignificant even when the equation is modified to control for age whilst the scale and direction of the outstanding variables remain broadly unchanged. The final iteration of the model introduces all of the control variables used previously. In this model, three of the four independent

variables are statistically significant and the coefficient of each of these variables is positive; in particular, the respondent's subjective assessment of the quality of the neighbourhood is strongly correlated with housing satisfaction. By contrast, the propensity to worry about crime is not statistically significant in any of the models estimated.

Table 6 here.

4.5 The Co-variates of Housing Satisfaction: Local Activities and Community Engagement Indicators

This analysis begins with a model which considers the relationship between housing satisfaction and social engagement where the latter reflects each respondent's functionings (or what they are or do within their community). For the purposes of this analysis, engagement with the local community is measured using seven variables denoting local activities undertaken (socializing, volunteering, etc.). In this first iteration of the model, four of these variables had coefficients that were statistically significant at the 5 per cent level – attending sporting events, socializing, attending church and membership of an environmental interest group – and in each case, these variables are positively correlated with housing satisfaction: a propensity to undertake a range of other local activities (including volunteering and political activism) is not statistically significant. In a second iteration of the model, gender is added but there is no discernible change.

When the respondent's age is added to the model, five of the independent variables are statistically significant. Specifically, the propensity to attend artistic events and political activism become statistically significant albeit that the direction of the relationship between these variables and the dependent variable does differ; attendance at artistic events is positively correlated with housing satisfaction whilst political activism is negatively correlated. Moreover, the scale of the coefficient of the latter variable increases significantly. This may suggest that persons who are dissatisfied with some aspect of their community are more likely to commence campaigning in pursuit of change. Interestingly, when German nationality and tenure are introduced as control variables in the next iterations of this model, the number of statistically significant independent variables falls back to just three (socializing, attending church and membership of an environmental interest group). This could indicate that participation (social inclusion) in activities is linked to being a national of the country in which one lives, something that we might expect to see replicated in most countries.

Finally, the sixth iteration of the model introduces all of the control variables listed above. In this model, five of the principal independent variables are statistically significant. In the case of four of these variables (attendance at sporting events, socializing, attendance at church and membership of an environmental interest group), the direction of the relationship with housing satisfaction. In the case of political activism, this variable continues to show a negative relationship with housing satisfaction.

Table 7 here.

4.6 The Co-variates of Housing Satisfaction: Estimating the Broader Model

The analysis to date has focussed on the covariates of housing satisfaction in each of the four areas of concern, an approach that was warranted given the relative novelty and multi-dimensionality of the phenomena under investigation. However, to develop a proper sense of how these variables relate, we need to estimate models in which all variables appear and the results of doing so are

presented in Table 3. This regression presents housing satisfaction as a function of all independent variables that were explored previously when age, gender, German nationality and tenure are controlled for. The results of this analysis indicate those variables examined are statistically significant[13] and that the assessments regarding the sufficiency of space within the home, the general condition of the dwelling and the quality of the neighbourhood are statistically significant at the 5 per cent level and have a relatively strong positive correlation with overall housing satisfaction. The results also demonstrate that certain objective measures of the physical attributes of a dwelling are important predictive variables; the presence of central heating, a terrace and a garden are statistically significant and positively related to housing satisfaction.

The results of this linear analysis also demonstrate that what a person can do and their degree of social engagement within their own community are important predictive variables. For instance, the capacity to invite friends to dinner and to socialize and the propensity to attend sporting (or church) events or engage politically are all statistically significant at the 5 per cent level and are positively related to overall housing satisfaction (save for political engagement which is negatively related to housing satisfaction). Furthermore, the variable denoting gainful employment is statistically significant and shows a positive coefficient in this final model although the direction of the coefficient was opposite in a number of the models discussed earlier. The variable denoting anxiety about crime is also statistically significant in this broader model and this variable is negatively related to housing satisfaction. The results of this linear estimation are also supported by the estimation of further, complementary probit and logistic models[14].

This finding viz crime is consistent with earlier work (see for example Anand and Santos (2007)) in which violent crime appears to play a significant role on satisfaction with life. Finally, private ownership of a property was negatively correlated with housing satisfaction. This absence of an automatic overlap between ownership and housing satisfaction, however, is neither counter-intuitive nor inconsistent with previous research. Homeownership rates in Germany are low by comparison with many other Western economies and recent research by Diaz-Serrano (2006) found that ownership was more important in those countries where owner-occupation was the dominant tenure status (i.e. viewed as the natural state and thus, as an aspiration which people expect to fulfil).

Tables 8, 9 and 10 here.

5. Conclusions

The capability theory approach is a key development in thinking on issues of poverty assessment. The traditional economic approach to poverty assessment has been centred on monetary measures of utility but the capability approach moves beyond this to examine the importance of functionings - what a person does or is – and their opportunities. Recent research in this field has examined the relationship between wider social indicators such as health outcomes, education levels and

[13] A series of Block Exclusion (F) tests were applied to each of the four sets of covariates used here (see Table 9)

[14] In most cases, with a small number of exceptions, the nature and direction of these relationships were re-affirmed by the additional regressions. Approximately 80 per cent of all respondents rated their housing satisfaction at 7 or higher (out of 10). These results were recoded as '>7' is 1 and '<7' is 0 and a series of complementary probit and logistic regression models were estimated for comparative purposes. These results are presented at Table 10

employment status on life satisfaction and happiness. The evidence presented in this paper on the relationship between housing satisfaction and subjective well-being – and on the role played by a diverse range of housing and neighbourhood characteristics through the mediating effect of housing satisfaction – indicates that housing broadly construed, impacts on life satisfaction in a number of ways.

The preceding analysis demonstrates that satisfaction with housing is a statistically significant component of broader life satisfaction and that housing satisfaction itself can be decomposed into a series of individual components relating to dwelling characteristics, neighbourhood quality and liveability and community interaction. The results also indicate that certain physical attributes of dwellings are positively related to housing satisfaction. Our analysis confirms Diaz-Serrano's (2006) finding that dwelling deficiencies exert a negative effect on housing satisfaction and that the physical condition of the dwelling, the provision of sufficient living space and the presence of attributes such as central heating and a garden particularly important in this regard.The results presented here indicate that the presence or absence of what are basic amenities in dwellings in developed countries such as running water and indoor toilets are not actually statistically significant in terms of housing satisfaction, perhaps reflecting an element of habituation whereby German people do not ascribe any inherent value to common facilities that they have come to expect.

However, the results indicate that the physical attributes of a dwelling are not the sole determinants of housing satisfaction but that a series of factors reflecting the quality and liveability of the neighbourhood and the potential for interaction with the broader community of residents also play an important role in shaping satisfaction, thereby suggesting that respondents attach importance to neighbourhood quality and liveability and do not simply conceptualise the home as a space isolated from the outside world. Rather, a number of variables denoting neighbourhood interaction and social engagement (or those local activities that can be undertaken) – such as inviting friends to dinner, socialising and attending church – are also statistically significant in our model of housing satisfaction. This is in accordance with other research whereby neighbourhood and life satisfaction have been found to be positively correlated (Parkes et al, 2002). The results presented at Table 3 suggest that private ownership of property is statistically significant but negatively correlated with housing satisfaction. This seems counter-intuitive given that homeownership can be expected to provide a mechanism for fulfilling expectations and conferring status and a greater sense of control. However, a number of factors must be borne in mind when interpreting this result. Firstly, housing-related expectations are shaped by prevailing housing norms (and private renting is the dominant tenure in Germany and homeownership rates are low by comparison with many other Western economies). Secondly, other research has demonstrated that although homeownership can serve to increase self-esteem and a sense of control, this effect is not necessarily statistically significant and that it is not wholly uncommon for tenants to report higher levels of housing satisfaction than owners (Rohe and Stegman, 1994; Oswald, 2003).

Thus the analysis presented in this article provides several useful insights for public policy-makers concerned with housing, communities and area regeneration, given that our results demonstrate that housing (and by extensions, neighbourhood) satisfaction cannot be enhanced solely by addressing accommodation standards, housing costs and material deprivation within a household or promoting home ownership. Rather, the results suggest that a more holistic approach is required whereby accommodation – whether owner-occupied or rented – is delivered within a context of sustainable

communities, which include facilities that enable greater levels of social engagement and access to local services.

When interpreting these results it is important to note some potential limitations to both the data and models used here. For instance, some of the variables mentioned in the literature review, such place attachment, the personalisation of the home and individual expectations, do not have good corresponding variables in the dataset used here whilst other themes emerging from this literature, such as community engagement and the availability of local activities, required the derivation of useful proxies, including participation in sporting or artistic events. Secondly, in each of the models estimated above subjective survey responses, such as SWB and housing satisfaction, are used as the dependent variables. Such responses can be confounded by cultural factors or experiences albeit, nonetheless, this approach has increasingly gained traction within the capabilities approach and within economic research more generally. Finally, a more extensive set of independent variables than that employed here, perhaps addressing more of the issues surfaced in the international literature surrounding the determinants of housing and neighbourhood satisfaction, needs and preferences, could well serve to explain a higher proportion of the observed variance than do the models estimated in this research.

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Tables

Table 1a: Summary Statistics for Life Satisfaction and other sub-domains

Variable	Obs	Mean	Std. Dev.	Min	Max
Health Satisfaction	20,886	6.56	2.22	1	10
Work Satisfaction	20,886	3.21	4.64	1	10
Housework Satisfaction	20,886	4.65	4.03	1	10
Household Income Satisfaction	20,886	6.14	2.42	1	10
Personal Income Satisfaction	20,886	5.44	2.78	1	10
Housing Satisfaction	20,886	7.77	1.94	1	10
Leisure Time Satisfaction	20,886	6.92	2.27	1	10
Childcare Satisfaction	20,886	-0.60	3.31	1	10
Family Life Satisfaction	20,886	7.53	2.26	1	10
Volunteer Work Satisfaction	20,886	0.12	3.96	1	10
Social Security System Satisfaction	20,886	5.19	2.29	1	10
Life Satisfaction	20,886	6.93	1.82	1	10

Table 1b: Summary Statistics for Capabilities Covariates

Variable	Obs	1	0
		%	
Good Condition	27300	74.3	25.5
Good Space	27300	73.0	26.9
Kitchen	27300	99.3	0.5
Bathroom	27300	99.5	0.3
Water	27300	99.6	0.1
Toilet	27300	99.3	0.5
Heating	27300	97.1	2.6
Terrace	27300	80.4	18.8
Storage	27300	94.4	5.3
Garden	27300	66.4	32.8
Solar	27300	5.3	91.6
Worried about crime	20886	88.1	11.2
Good neighbourhood	27300	91.4	7.9
Invite friends to dinner	27300	46.1	53.5
Sporting Events	20886	59.5	39.9
Artistic Events	20886	44.2	54.9
Socialise	20886	96.8	2.7
Volunteering	20886	30.7	68.8
Politically Active	20886	8.1	90.8
Attend Church	20886	46.7	52.8
Environmental Interest Group	20866	4.2	93.2

Table 2a: Correlation Results for SWB and other sub-domain subjective evaluations

Variable	Life Satisfaction	Health Satisfaction	Work Satisfaction	Housework Satisfaction	House. Income Satisfaction	Person. Income Satisfaction	Housing Satisfaction	F. Life Satisfaction
Health Satisfaction	0.51	1.00						
Work Satisfaction	0.19	0.29	1.00					
Housework Satisfaction	0.13	0.13	0.00	1.00				
House. Income Satisfaction	0.48	0.30	0.17	0.14	1.00			
Personal Income Satisfaction	0.38	0.21	0.33	0.04	0.65	1.00		
Housing Satisfaction	0.37	0.24	0.06	0.15	0.43	0.33	1.00	
Family Life Satisfaction	0.40	0.26	0.06	0.13	0.32	0.21	0.40	1.00

Table 2b: Correlation Results for SWB, Housing Satisfaction and Capabilities Covariates

Variable	Life Satisfaction	Housing Satisfaction
Good Condition	0.14	0.29
Good Space	0.04	0.18
Kitchen	0.03	0.05
Bathroom	0.02	0.04
Water	0.02	0.03
Toilet	0.03	0.04
Heating	0.05	0.09
Storage	0.03	0.05
Garden	0.12	0.21
Solar	0.05	0.06
Privately-owned	-0.11	-0.23
Government-owned	-0.12	-0.23
Coop-owned	-0.11	-0.23
Company-owned	-0.10	-0.21
Government-subsidised	-0.12	-0.23
Employed	0.11	-0.01
Worried about crime	-0.02	0.01
Good neighbourhood	0.11	0.20
Invite friends to dinner	0.20	0.12
Sporting Events	0.18	0.04
Artistic Events	0.12	0.04
Socialise	0.09	0.06
Volunteering	0.09	0.04
Politically Active	0.04	0.02
Attend Church	0.11	0.09
Environmental Interest Group	0.05	0.05

Table 3a: Regression of Subjective Well-Being on Sub-satisfaction Domains

Variable	Coef.	Std Error	t stat	P value
Constant	47.37	10.55	4.49	**0.00**
Health Satisfaction	0.26	0.01	52.85	**0.00**
Work Satisfaction	0.01	0.00	4.80	**0.00**
Housework Satisfaction	0.00	0.00	0.09	0.93
Household Income Satisfaction	0.15	0.01	25.84	**0.00**
Personal Income Satisfaction	0.06	0.01	11.54	**0.00**
Housing Satisfaction	0.05	0.01	7.64	**0.00**
Leisure Time Satisfaction	0.08	0.01	15.65	**0.00**
Childcare Satisfaction	-0.00	0.00	-0.98	0.33
Family Life Satisfaction	0.13	0.01	27.37	**0.00**
Volunteer Work Satisfaction	0.01	0.00	5.72	**0.00**
Social Security System Satisfaction	0.06	0.01	12.43	**0.00**
Male	-0.10	0.02	-4.99	**0.00**
Age (in years)	-0.00	0.00	-4.32	**0.00**
German	-0.09	0.04	-2.36	**0.02**
Owner	0.10	0.02	5.14	**0.00**
	Number of obs = 20863 R-squared = 0.4463 Adj R-squared = 0.4459 F(15, 20,874)= 1120.39 Prob>F= 0.0000			

Table 3b: Regression of Subjective Well-Being on Sub-satisfaction Domains (restricted)

Variable	Coef.	Std Error	t stat	P value
Constant	45.55	10.39	4.39	**0.00**
Health Satisfaction	0.27	0.01	53.01	**0.00**
Work Satisfaction	0.01	0.00	4.76	**0.00**
Household Income Satisfaction	0.15	0.01	25.89	**0.00**
Personal Income Satisfaction	0.06	0.00	11.55	**0.00**
Housing Satisfaction	0.05	0.01	7.63	**0.00**
Leisure Time Satisfaction	0.08	0.01	15.86	**0.00**
Family Life Satisfaction	0.13	0.00	27.38	**0.00**
Volunteer Work Satisfaction	0.01	0.00	5.67	**0.00**
Social Security System Satisfaction	0.06	0.01	12.41	**0.00**
Male	-0.10	0.02	-5.17	**0.00**
Age (in years)	-0.00	0.00	-4.21	**0.00**
German	-0.09	0.04	-2.31	**0.02**
Owner	0.10	0.02	5.15	**0.00**
	Number of obs = 20863 R-squared = 0.4463 Adj R-squared = 0.4460 F(13, 20,849)= 1292.74 Prob>F= 0.0000			

Table 4: Regression of Housing Satisfaction on Dwelling Characteristics with Gender, Age, German Nationality and Tenure Controls

Variable	Dwelling Characteristics				Dwelling Characteristics and Gender				Dwelling Characteristics and Age				Dwelling Characteristics and German Nationality				Dwelling Characteristics and Tenure			
	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P value
Constant	6.28	0.14	43.94	**0.00**	6.30	0.14	43.93	**0.00**	5.73	0.15	39.22	**0.00**	5.82	0.15	38.51	**0.00**	6.06	0.14	42.41	**0.00**
Good Condition	1.07	0.03	36.81	**0.00**	1.07	0.03	36.81	**0.00**	1.03	0.03	35.76	**0.00**	1.07	0.03	36.82	**0.00**	1.03	0.03	35.36	**0.00**
Good Space	0.62	0.03	22.19	**0.00**	0.62	0.03	22.19	**0.00**	0.61	0.03	21.91	**0.00**	0.61	0.03	21.98	**0.00**	0.62	0.03	22.37	**0.00**
Kitchen	-0.12	0.15	-0.76	0.45	-0.11	0.15	-0.76	0.45	-0.16	0.15	-1.07	0.29	-0.10	0.15	-0.69	0.49	-0.10	0.15	-0.63	0.53
Bathroom	-0.37	0.17	-2.22	**0.03**	-0.37	0.17	-2.23	**0.03**	-0.36	0.16	-2.20	**0.03**	-0.35	0.17	-2.12	**0.03**	-0.28	0.16	-1.68	0.09
Water	-0.41	0.16	-2.55	**0.01**	-0.41	0.16	-2.54	**0.01**	-0.31	0.16	-1.93	0.05	-0.40	0.16	-2.48	**0.01**	-0.31	0.16	-1.92	0.06
Toilet	-0.01	0.14	-0.06	0.95	-0.01	0.14	-0.06	0.95	-0.01	0.14	-0.06	0.95	-0.01	0.14	-0.06	0.95	0.01	0.14	0.09	0.93
Heating	0.33	0.07	4.62	**0.00**	0.33	0.07	4.62	**0.00**	0.34	0.07	4.76	**0.00**	0.32	0.07	4.52	**0.00**	0.31	0.07	4.42	**0.00**
Terrace	0.36	0.03	11.65	**0.00**	0.36	0.03	11.64	**0.00**	0.35	0.03	11.33	**0.00**	0.35	0.03	11.38	**0.00**	0.30	0.03	9.81	**0.00**
Storage	0.11	0.05	2.03	**0.04**	0.11	0.05	2.03	**0.04**	0.08	0.05	1.48	0.14	0.12	0.05	2.29	**0.02**	0.09	0.05	1.81	0.07
Garden	0.67	0.03	26.02	**0.00**	0.67	0.03	26.03	**0.00**	0.66	0.03	25.71	**0.00**	0.63	0.03	24.43	**0.00**	0.43	0.03	14.10	**0.00**
Solar	0.10	0.04	2.27	**0.02**	0.10	0.04	2.29	**0.02**	0.12	0.04	2.67	**0.01**	0.10	0.04	2.27	**0.02**	0.07	0.04	1.72	0.09
Male					-0.03	0.02	-1.33	0.18												
Age (in years)									0.01	0.00	16.13	**0.00**								
German													0.49	0.05	9.40	**0.00**				
Owner																	0.46	0.03	15.25	**0.00**
	Number of obs = 20863 R-squared = 0.1465 Adj R-squared = 0.1461				Number of obs = 20863 R-squared = 0.1466 Adj R-squared = 0.1461				Number of obs = 20863 R-squared = 0.1570 Adj R-squared = 0.1565				Number of obs = 20863 R-squared = 0.1501 Adj R-squared = 0.1496				Number of obs = 20863 R-squared = 0.1559 Adj R-squared = 0.1554			

Table 4 (cont'd): Regression of Housing Satisfaction on Dwelling Characteristics with Gender, Age, German Nationality and Tenure Controls

Variable	**Dwelling Characteristics, Age, Gender, German Nationality and Tenure**			
	Coef.	Std Error	t stat	P value
Constant	5.22	0.15	34.03	**0.00**
Good Condition	1.00	0.03	34.63	**0.00**
Good Space	0.61	0.03	21.92	**0.00**
Kitchen	-0.13	0.15	-0.85	0.40
Bathroom	-0.27	0.16	-1.64	0.10
Water	-0.22	0.16	-1.39	0.17
Toilet	0.01	0.14	0.07	0.95
Heating	0.32	0.07	4.47	**0.00**
Terrace	0.29	0.03	9.50	**0.00**
Storage	0.08	0.05	1.56	0.12
Garden	0.42	0.03	13.84	**0.00**
Solar	0.09	0.04	2.17	**0.03**
Male	-0.04	0.02	-1.53	0.13
Age (in years)	0.01	0.00	14.23	**0.00**
German	0.42	0.05	8.09	**0.00**
Owner	0.40	0.03	13.27	**0.00**
	Number of obs = 20863			
	R-squared = 0.1672			
	Adj R-squared = 0.1666			

Table 5: Regression of Housing Satisfaction on Ownership and Financial Status Indicators with Gender, Age, German Nationality and Tenure Controls

Variable	Ownership				Ownership and Gender				Ownership and Age				Ownership and German Nationality				Ownership and Tenure			
	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P val
Constant	7.35	0.14	53.18	**0.00**	7.37	0.14	53.12	**0.00**	6.73	0.14	47.70	**0.00**	6.87	0.15	47.15	**0.00**	7.35	0.14	53.14	**0.00**
Privately-owned	-0.71	0.17	-4.12	**0.00**	-0.72	0.17	-4.13	**0.00**	-0.82	0.17	-4.76	**0.00**	-0.74	0.17	-4.26	**0.00**	-0.72	0.17	-4.13	**0.00**
Government-owned	0.21	0.07	2.85	**0.00**	0.21	0.07	2.85	**0.00**	0.21	0.07	2.98	**0.00**	0.22	0.07	3.08	**0.00**	0.21	0.07	2.85	**0.00**
Coop-owned	-0.10	0.17	-0.58	0.56	-0.10	0.17	-0.57	0.57	0.01	0.17	0.04	0.97	-0.06	0.17	-0.38	0.71	-0.09	0.17	-0.56	0.57
Company-owned	0.36	0.06	5.82	**0.00**	0.36	0.06	5.83	**0.00**	0.43	0.06	6.98	**0.00**	0.36	0.06	5.75	**0.00**	0.37	0.06	5.81	**0.00**
Government-subsidised	-0.16	0.03	-4.78	**0.00**	-0.16	0.03	-4.81	**0.00**	-0.16	0.03	-4.89	**0.00**	-0.15	0.03	-4.57	**0.00**	-0.14	0.06	-2.47	**0.01**
Monthly rent	0.00	0.00	8.92	**0.00**	0.00	0.00	8.92	**0.00**	0.00	0.00	9.50	**0.00**	0.00	0.00	9.02	**0.00**	0.00	0.00	8.90	**0.00**
Monthly mortgage	0.00	0.00	2.95	**0.00**	0.00	0.00	2.96	**0.00**	0.00	0.00	6.90	**0.00**	0.00	0.00	3.42	**0.00**	0.00	0.00	2.91	**0.00**
Male					-0.05	0.03	-1.76	0.08												
Age (in years)									0.01	0.00	18.41	**0.00**								
German													0.55	0.05	10.16	**0.00**				
Owner																	0.05	0.13	0.35	0.73
	Number of obs = 20863 R-squared = 0.0620 Adj R-squared = 0.0617				Number of obs = 20863 R-squared = 0.0621 Adj R-squared = 0.0618				Number of obs = 20863 R-squared = 0.0770 Adj R-squared = 0.0766				Number of obs = 20863 R-squared = 0.0666 Adj R-squared = 0.0662				Number of obs = 20863 R-squared = 0.0620 Adj R-squared = 0.0616			

Table 5 (cont'd): Regression of Housing Satisfaction on Ownership and Financial Status Indicators with Gender, Age, German Nationality and Tenure Controls

Variable	**Ownership, Age, Gender, German Nationality and Tenure**			
	Coef.	Std Error	t stat	P value
Constant	6.31	0.15	42.44	**0.00**
Privately-owned	-0.84	0.17	-4.87	0.00
Government-owned	0.23	0.07	3.19	0.00
Coop-owned	0.03	0.17	0.20	0.84
Company-owned	0.42	0.06	6.72	0.00
Government-subsidised	-0.18	0.06	-3.18	0.00
Monthly rent	0.00	0.00	9.61	0.00
Monthly mortgage	0.00	0.00	7.32	0.00
Male	-0.04	0.03	-1.55	0.12
Age (in years)	0.01	0.00	18.14	0.00
German	0.52	0.05	9.67	0.00
Owner	-0.07	0.13	-0.56	0.57
	Number of obs = 20863			
	R-squared = 0.0812			
	Adj R-squared = 0.0808			

Table 6: Regression of Housing Satisfaction on Neighbourhood Quality and Social Interaction Indicators with Gender, Age, German Nationality and Tenure Controls

Variable	**Neighbourhood Quality**				**Neighbourhood Quality and Gender**				**Neighbourhood Quality and Age**				**Neighbourhood Quality and German Nationality**				**Neighbourhood Quality and Tenure**			
	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P val
Constant	6.72	0.05	130.5	**0.00**	6.73	0.05	126.9	**0.00**	5.82	0.07	87.50	**0.00**	6.05	0.07	86.20	**0.00**	6.42	0.05	125.20	**0.00**
Employed	-0.07	0.03	-2.68	**0.01**	-0.07	0.03	-2.62	**0.01**	0.18	0.03	6.33	**0.00**	-0.08	0.03	-2.94	**0.00**	-0.08	0.03	-3.06	**0.00**
Worried about Crime	0.02	0.04	0.52	0.60	0.02	0.04	0.51	0.61	-0.05	0.04	-1.43	0.15	0.00	0.04	0.13	0.90	0.00	0.04	0.12	0.90
Good Neighbourhood	1.01	0.04	26.61	**0.00**	1.01	0.04	26.61	**0.00**	0.97	0.04	25.95	**0.00**	0.97	0.04	25.62	**0.00**	0.90	0.04	24.25	**0.00**
Invite Friends to Dinner	0.36	0.03	14.01	**0.00**	0.36	0.03	14.01	**0.00**	0.36	0.03	14.35	**0.00**	0.38	0.03	15.00	**0.00**	0.31	0.03	12.41	**0.00**
Male					-0.01	0.03	-0.33	0.75												
Age (in years)									0.02	0.00	20.99	**0.00**								
German													0.76	0.05	13.93	**0.00**				
Owner																	0.80	0.03	30.72	**0.00**
	Number of obs = 20863 R-squared = 0.0469 Adj R-squared = 0.0468				Number of obs = 20863 R-squared = 0.0469 Adj R-squared = 0.0467				Number of obs = 20863 R-squared = 0.0667 Adj R-squared = 0.0664				Number of obs = 20863 R-squared = 0.0557 Adj R-squared = 0.0555				Number of obs = 20863 R-squared = 0.0882 Adj R-squared = 0.0880			

Table 6 (cont'd): Regression of Housing Satisfaction on Neighbourhood Quality and Social Interaction Indicators with Gender, Age, German Nationality and Tenure Controls

Variable	**Neighbourhood Quality, Age, Gender, German Nationality and Tenure**											
	Coef.	Std Error	t stat	P value								
Constant	5.31	0.08	66.81	**0.00**								
Employed	0.13	0.03	4.41	**0.00**								
Worried about Crime	-0.07	0.04	-1.79	0.07								
Good Neighbourhood	0.86	0.04	23.27	**0.00**								
Invite Friends to Dinner	0.34	0.02	13.53	**0.00**								
Male	-0.05	0.03	-2.00	**0.04**								
Age (in years)	0.01	0.00	16.92	**0.00**								
German	0.52	0.05	9.67	**0.00**								
Owner	0.71	0.03	26.97	**0.00**								
	Number of obs = 20863 R-squared = 0.1052 Adj R-squared = 0.1049											

Table 7: Regression of Housing Satisfaction on Local Activities and Community Engagement Indicators with Gender, Age, German Nationality and Tenure Controls

Variable	**Local Activities**				**Local Activities and Gender**				**Local Activities and Age**				**Local Activities and German Nationality**				**Local Activities and Tenur**			
	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P value	Coef.	Std Error	t stat	P va
Constant	7.20	0.06	116.1	**0.00**	7.20	0.06	113.3	**0.00**	6.16	0.08	79.78	**0.00**	6.45	0.08	80.39	**0.00**	6.85	0.06	111.2	**0.**
Sporting Events	0.07	0.03	2.52	**0.01**	0.07	0.03	2.52	**0.01**	0.25	0.03	8.38	**0.00**	0.05	0.03	1.91	0.06	0.04	0.03	1.40	0.
Artistic Events	0.02	0.03	0.63	0.53	0.02	0.03	0.64	0.53	0.06	0.03	2.16	**0.03**	0.00	0.03	-0.16	0.87	0.00	0.03	0.03	0.
Socialise	0.37	0.06	5.86	**0.00**	0.37	0.06	5.86	**0.00**	0.47	0.06	7.43	**0.00**	0.38	0.06	5.97	**0.00**	0.38	0.06	6.10	**0.**
Volunteering	0.06	0.03	1.88	0.06	0.06	0.03	1.87	0.06	0.06	0.03	1.94	0.05	0.03	0.03	0.99	0.32	-0.03	0.03	-0.85	0.
Politically Active	-0.06	0.05	-1.15	0.25	-0.06	0.05	-1.15	0.25	-0.12	0.05	-2.52	**0.01**	-0.06	0.05	-1.28	0.20	-0.08	0.05	-1.65	0.
Attend Church	0.31	0.03	11.20	**0.00**	0.31	0.03	11.18	**0.00**	0.22	0.03	8.15	**0.00**	0.33	0.03	12.28	**0.00**	0.18	0.03	6.51	**0.**
Environmental Interest Group	0.29	0.05	5.69	**0.00**	0.29	0.05	5.68	**0.00**	0.26	0.05	5.10	**0.00**	0.29	0.05	5.60	**0.00**	0.27	0.05	5.37	**0.**
Male					0.00	0.03	0.05	0.96												
Age (in years)									0.02	0.00	22.06	**0.00**								
German													0.81	0.06	14.62	**0.00**				
Owner																	0.84	0.03	31.42	**0.**
	Number of obs = 20886 R-squared = 0.0128 Adj R-squared = 0.0125				Number of obs = 20886 R-squared = 0.0128 Adj R-squared = 0.0125				Number of obs = 20886 R-squared = 0.0353 Adj R-squared = 0.0350				Number of obs = 20886 R-squared = 0.0228 Adj R-squared = 0.0225				Number of obs = 20863 R-squared = 0.0574 Adj R-squared = 0.0570			

Table 7 (cont'd): Regression of Housing Satisfaction on Local Activities and Community Engagement Indicators with Gender, Age, German Nationality and Tenure Controls

Variable	**Local Activities, Age, Gender, German Nationality and Tenure**			
	Coef.	Std Error	t stat	P value
Constant	5.59	0.09	62.45	**0.00**
Sporting Events	0.17	0.03	5.85	**0.00**
Artistic Events	0.02	0.03	0.72	0.47
Socialise	0.46	0.06	7.40	**0.00**
Volunteering	-0.03	0.03	-1.06	0.29
Politically Active	-0.13	0.05	-2.73	**0.01**
Attend Church	0.14	0.03	5.23	**0.00**
Environmental Interest Group	0.24	0.05	4.88	**0.00**
Male	-0.02	0.03	-0.76	0.45
Age (in years)	0.01	0.00	17.50	**0.00**
German	0.53	0.05	9.75	**0.00**
Owner	0.75	0.03	27.61	**0.00**
	Number of obs = 20863			
	R-squared = 0.0765			
	Adj R-squared = 0.0760			

Table 8a: Regression of Housing Satisfaction on all Variables

Variable	Coef.	Std Error	t stat	P value
Constant	-204.4	12.78	-15.98	**0.00**
Good Condition	0.89	0.03	30.55	**0.00**
Good Space	0.60	0.03	21.76	**0.00**
Kitchen	-0.07	0.15	-0.47	0.64
Bathroom	-0.19	0.16	-1.17	0.24
Water	-0.31	0.16	-1.94	0.05
Toilet	0.01	0.14	0.06	0.95
Heating	0.27	0.07	3.86	**0.00**
Terrace	0.22	0.03	7.17	**0.00**
Storage	0.04	0.05	0.77	0.44
Garden	0.30	0.03	9.55	**0.00**
Solar	0.06	0.04	1.45	0.15
Privately-owned	-0.55	0.16	-3.36	**0.00**
Government-owned	0.13	0.07	1.94	0.05
Coop-owned	0.07	0.16	0.47	0.64
Company-owned	0.29	0.06	4.90	**0.00**
Government-subsidised	-0.09	0.05	-1.74	0.08
Monthly rent	0.00	0.00	3.46	**0.00**
Monthly mortgage	0.00	0.00	3.61	**0.00**
Employed	0.08	0.03	2.83	**0.01**
Worried about crime	-0.09	0.03	-2.66	**0.01**
Good neighbourhood	0.54	0.04	15.04	**0.00**
Invite friends to dinner	0.21	0.02	8.83	**0.00**
Sporting Events	0.08	0.03	2.84	**0.01**
Artistic Events	0.03	0.03	1.01	0.31
Socialise	0.38	0.06	6.44	**0.00**
Volunteering	-0.01	0.03	-0.47	0.64
Politically Active	-0.11	0.04	-2.54	**0.01**
Attend Church	0.08	0.03	2.97	**0.00**
Environmental Interest Group	0.20	0.05	4.15	**0.00**
Male	-0.04	0.02	-1.50	0.13
Age (in years)	0.01	0.00	16.39	**0.00**
German	0.41	0.05	7.86	**0.00**
Owner	-0.11	0.12	-0.88	0.38
	Number of obs = 20863			
	R-squared = 0.1910			
	Adj R-squared = 0.1898			
	F(33, 20,829)= 149.05			
	Prob>F= 0.0000			

Table 8b: Regression of Housing Satisfaction on all Variables (restricted)

Variable	Coef.	Std Error	t stat	P value
Constant	-204.1	12.73	-16.03	**0.00**
Good Condition	0.89	0.03	30.63	**0.00**
Good Space	0.59	0.03	21.53	**0.00**
Heating	0.19	0.07	2.97	**0.00**
Terrace	0.22	0.03	7.08	**0.00**
Garden	0.29	0.03	9.47	**0.00**
Privately-owned	-0.37	0.04	-9.57	**0.00**
Company-owned	0.23	0.04	5.53	**0.00**
Monthly rent	0.00	0.00	3.63	**0.00**
Monthly mortgage	0.00	0.00	3.95	**0.00**
Employed	0.08	0.03	2.77	**0.01**
Worried about crime	-0.09	0.03	-2.56	**0.01**
Good neighbourhood	0.54	0.04	15.10	**0.00**
Invite friends to dinner	0.21	0.02	8.90	**0.00**
Sporting Events	0.09	0.03	3.31	**0.00**
Socialise	0.37	0.06	6.43	**0.00**
Politically Active	-0.12	0.04	-2.86	**0.00**
Attend Church	0.08	0.03	3.27	**0.00**
Environmental Interest Group	0.20	0.05	4.20	**0.00**
Age (in years)	0.01	0.00	16.40	**0.00**
German	0.41	0.05	8.03	**0.00**
	Number of obs = 20863			
	R-squared = 0.1900			
	Adj R-squared = 0.1892			
	F(20, 20,842)= 244.46			
	Prob>F= 0.0000			

Table 9: Clustered Results for Block Exclusion (F) Tests (ref: Table 8b)

Variable	Set 1	Set 2	Set 3	Set 4
Good Condition	0			
Good Space	0			
Heating	0			
Terrace	0			
Garden	0			
	F(5, 20,842)= 373.68			
	Prob>F= 0.0000			
Privately-owned		0		
Company-owned		0		
Monthly rent		0		
Monthly mortgage		0		
		F(4, 20,842)= 59.36		
		Prob>F= 0.0000		
Employed			0	
Worried about crime			0	
Good neighbourhood			0	
Invite friends to dinner			0	
			F(4, 20,842)= 89.42	
			Prob>F= 0.0000	
Sporting Events				0
Socialise				0
Politically Active				0
Attend Church				0
Environmental Interest Group				0
				F(5, 20,842)= 19.78
				Prob>F= 0.0000

Table 10a: Probit Regression of Housing Satisfaction on all Variables

Variable	Coef.	Std Error	z	P >{z}
Constant	-150.6	11.18	-13.54	**0.00**
Good Condition	0.56	0.02	24.15	**0.00**
Good Space	0.41	0.02	17.92	**0.00**
Kitchen	-0.05	0.12	-0.44	0.66
Bathroom	-0.21	0.15	-1.45	0.15
Water	-0.32	0.14	-2.21	**0.03**
Toilet	-0.05	0.12	-0.40	0.69
Heating	0.20	0.05	3.69	**0.00**
Terrace	0.14	0.03	5.44	**0.00**
Garden	0.20	0.03	7.48	**0.00**
Solar	0.03	0.04	0.74	0.46
Privately-owned	-0.23	0.13	-1.85	0.06
Government-owned	0.02	0.05	0.44	0.66
Coop-owned	0.03	0.12	0.22	0.83
Company-owned	0.13	0.05	2.75	**0.01**
Government-subsidised	-0.06	0.04	-1.46	0.14
Monthly rent	0.00	0.00	2.04	**0.04**
Monthly mortgage	0.00	0.00	3.15	**0.00**
Employed	0.07	0.02	2.92	**0.00**
Worried about crime	-0.06	0.03	-1.94	0.05
Good neighbourhood	0.31	0.03	11.26	**0.00**
Invite friends to dinner	0.13	0.02	6.05	**0.00**
Sporting Events	0.09	0.02	3.78	**0.00**
Artistic Events	0.06	0.02	2.46	**0.01**
Socialise	0.22	0.05	4.56	**0.00**
Volunteering	0.05	0.03	1.84	0.07
Politically Active	-0.07	0.04	-1.65	0.10
Attend Church	0.04	0.02	1.53	0.13
Environmental Interest Group	0.10	0.04	2.42	**0.02**
Male	0.00	0.02	-0.05	0.96
Age (in years)	0.01	0.00	13.49	**0.00**
German	0.27	0.04	6.58	**0.00**
Owner	-0.05	0.11	-0.45	0.65
	Number of obs = 20863			
	LR chi2 (33) = 3011.19			
	Prob>chi2 = 0.0000			
	Psuedo R2= 0.1470			
	Log Likelihood = -8739.2566			

Table 10b: Logistic Regression of Housing Satisfaction on all Variables

Variable	Coef.	Std Error	z	P >{z}
Constant	-253.9	19.76	-12.85	**0.00**
Good Condition	0.97	0.04	24.26	**0.00**
Good Space	0.74	0.04	18.46	**0.00**
Kitchen	-0.13	0.21	-0.63	0.53
Bathroom	-0.37	0.26	-1.41	0.16
Water	-0.55	0.26	-2.10	**0.04**
Toilet	-0.08	0.20	-0.37	0.71
Heating	0.33	0.09	3.55	**0.00**
Terrace	0.24	0.04	5.44	**0.00**
Garden	0.34	0.05	7.52	**0.00**
Solar	0.05	0.07	0.61	0.54
Privately-owned	-0.39	0.21	-1.81	0.07
Government-owned	0.03	0.09	0.35	0.73
Coop-owned	0.04	0.21	0.21	0.83
Company-owned	0.21	0.08	2.63	**0.01**
Government-subsidised	-0.09	0.07	-1.27	0.20
Monthly rent	0.00	0.00	2.11	**0.04**
Monthly mortgage	0.00	0.00	2.99	**0.00**
Employed	0.12	0.04	2.82	**0.01**
Worried about crime	-0.12	0.05	-2.17	0.03
Good neighbourhood	0.52	0.05	11.22	**0.00**
Invite friends to dinner	0.23	0.04	6.11	**0.00**
Sporting Events	0.16	0.04	3.65	**0.00**
Artistic Events	0.10	0.04	2.43	**0.02**
Socialise	0.37	0.08	4.57	**0.00**
Volunteering	0.09	0.05	1.98	**0.05**
Politically Active	-0.12	0.08	-1.59	0.11
Attend Church	0.07	0.04	1.67	0.09
Environmental Interest Group	0.17	0.08	2.26	**0.02**
Male	-0.01	0.04	-0.20	0.84
Age (in years)	0.02	0.00	12.80	**0.00**
German	0.48	0.07	6.82	**0.00**
Owner	-0.02	0.18	-0.11	0.91
	Number of obs = 20863			
	LR chi2 (33) = 3011.25			
	Prob>chi2 = 0.0000			
	Psuedo R2= 0.1470			
	Log Likelihood = -8739.2302			

Figures

Figure 1 Hypothesised housing 'Q' and SWB

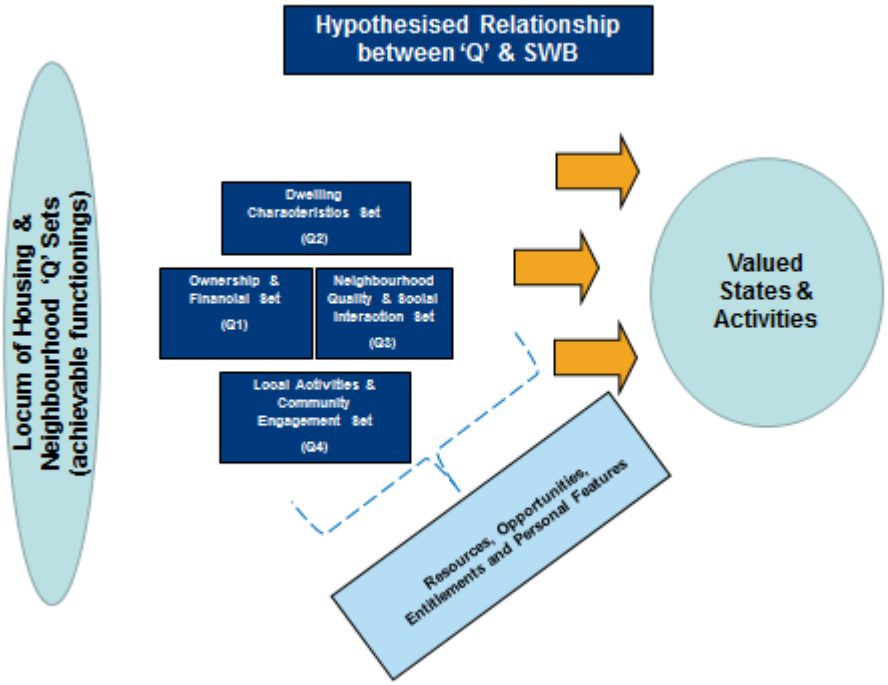


Figure 2 Hypothesised relationship between life sub-domains and SWB

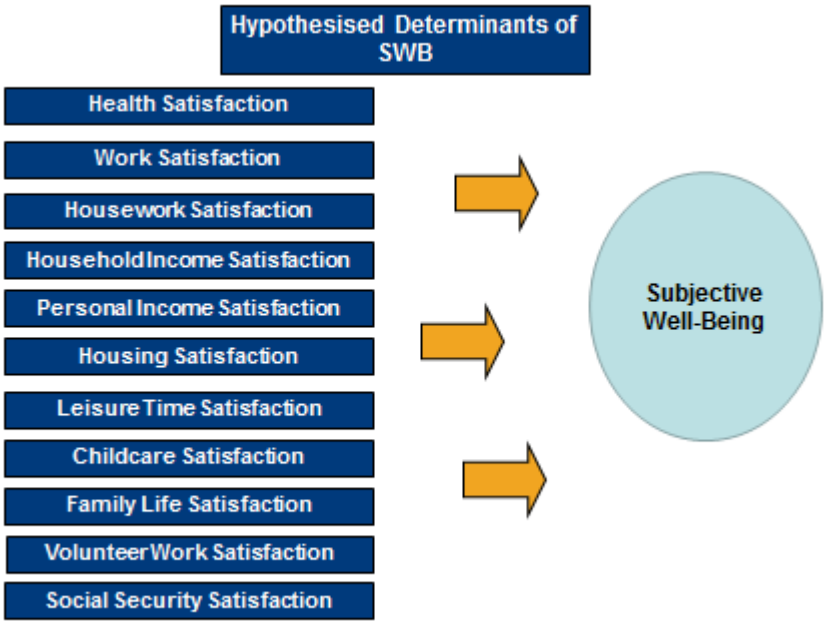


Figure 3 Hypothesised predictors (covariates) of Housing Satisfaction

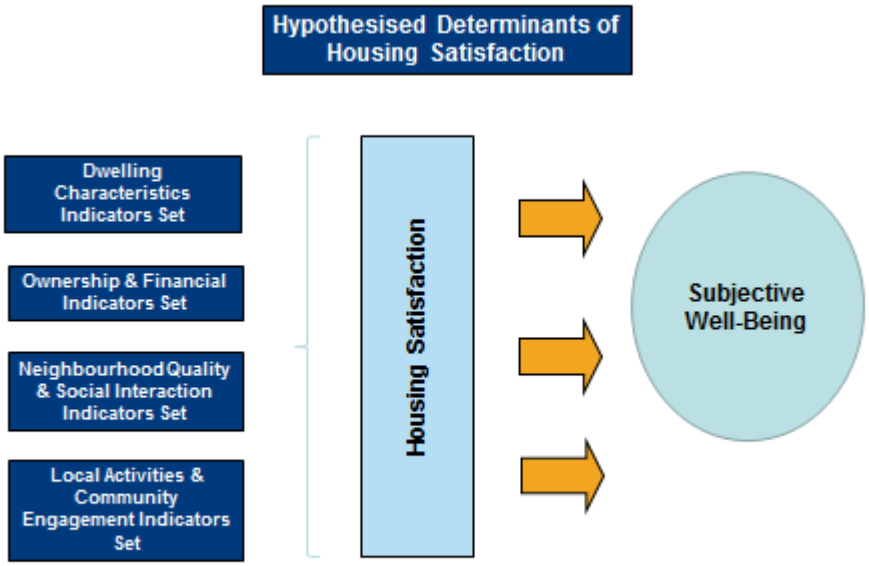


Figure 4 Life Satisfaction

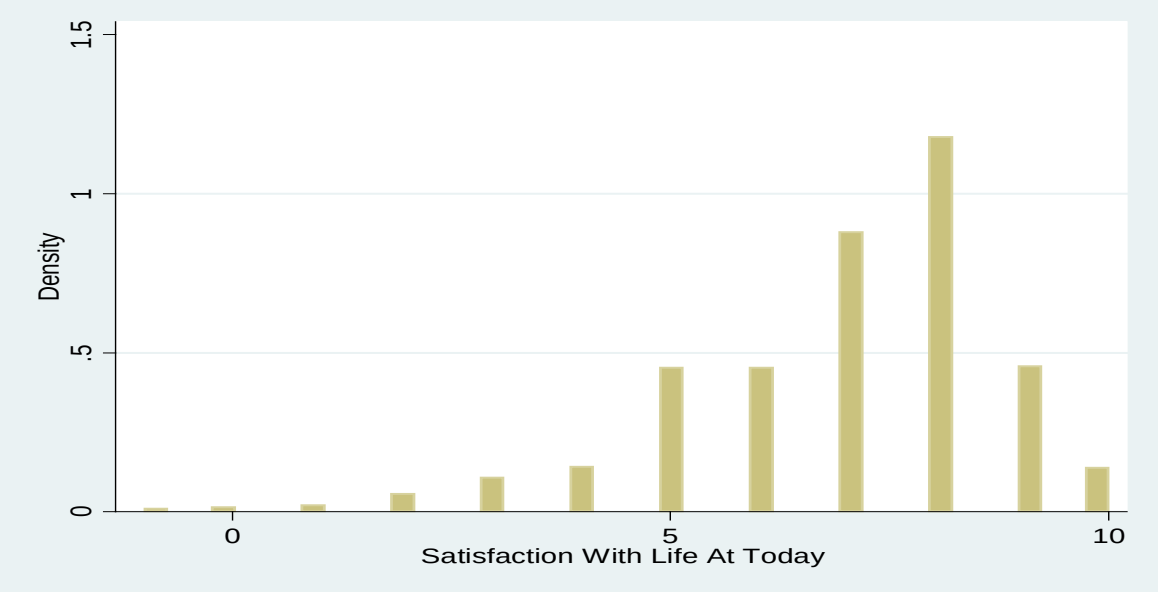
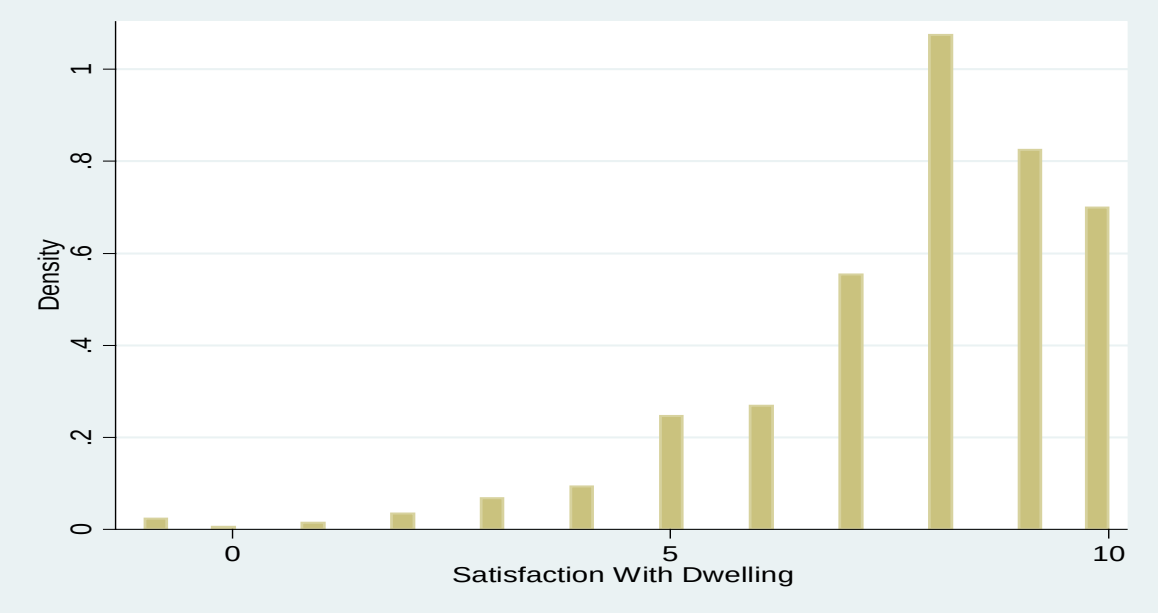


Figure 5 Housing Satisfaction



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