AN INVESTIGATION INTO THE DETERMINANTS OF BUILT ENVIRONMENTAL CUSTOMER SATISFACTION
An investigation of housing satisfaction

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Abstract
This research work adresses determinants of housing satisfaction, with emphasis on its physical attributes correlates. Two parallel field work studies are conducted. In a first stage, some 340 potential clients were interviewed in a building sales fair, asking how much they were satisfied with their present dwellings and reasons for their residential mobility decisions. In a second stage depth interviews were conducted with present occupants of a number of apartments buildings that were apparently satisfied with their homes, with no intention to move in the near future. The work enlarges Total Quality Management housing performance measurement by taking into consideration how behavioural attitudes are developed towards the appreciation of the dwelling unit, mainly in terms of how expectancies and desires are build up for each household.

Keywords: Housing satisfaction, residential mobility, post-occupancy evaluation, construction marketing.

1 Introduction

The concept of housing satisfaction has become the preeminent indicator used by numerous researchers and analysts [1] [2] [3] [4] [5] [6] for at least three different purposes: [i] it has been used as an evaluative measure of private and public sectors building performance; [ii] as an indicator of residential mobility and [iii] to evaluate occupants'perceptions of their residential environment and improvements in new projects. The architectural implications of housing satisfaction is the major concern of this reseach work.

Vischer *apud* Lawrence [7] stated that user satisfaction is connected to the realization of personal needs, and suggested that sociological studies of satisfaction are based on three main assumptions:

- it is possible to identify users' preferences by questioning their point of view;
- the fulfillment of users' needs result in the adequacy of the design and manipulation of physical environment;
- an environment design has a primary goal: meet users' needs and preferences.

For Soen [8], satisfaction can be defined as a clear explicit declaration by occupants or as the absence of complaints.

Others empirical studies have been based on the actual-aspirational gap approach to residential satisfaction. This theory states that occupants perceive and evaluate attributes of their physical environment according to what they aspire to. The satisfaction results of the gap between perceived actual environment and the aspired environment Galster [5].

A number of researchers analysed the correlation between housing satisfaction, quality of the dwelling and residential mobility process. Variables such as personal characteristics, home ownership, life cycle stage, age, location, neighbourhood and housing characteristics have been frequently incorporated in these studies, with less emphasis on the last issue. A brief account of major developments in the area is given in the following paragraphs.

In the relevant literature of residential mobility, Rossi's formulation about housing adjustments and changes in household life cycle has remained as a standard for subsequent studies [9].

Pickvance [10] explained the mobility through four variables: life-cycle, age, income and housing tenure. Notwithstandingly the stress-threshold model proposed that a move is not considered unless people experience residential stress [3].

One of the most used models of residential mobility stated the correlation of household socio-economic characteristics, location and neighbourhood attributes, the satisfaction derived from them and the mobility behaviour. The satisfaction may be measured relative to a persons' threshold for dissatisfaction and is the major predictive variable for mobility [3] [4] [11]. In this sense, dissatisfying factors should be investigated rather than satisfying ones.

Others theories showed the interaction between residential environment and household life cycle and the position in the labor market. The housing is viewed as a social adaptation process. According to this line of thought, there is a hierarchy of attributes and reasons for moving. The house itself, being of lower ranking in this hierarchy setting, enables the adaptation to new patterns of relationship between work and daily life activities, creating values and attitudes towards changing aspirations in terms of residential attributes [12].

Although customer satisfaction has become one of the principal instruments for marketing success, as one of the key elements of Total Quality Management, it is still doubtfull how individual housing attributes might be correlated to satisfaction with the new dwellings being developed.

Once a list of design attributes is proposed and its relative importance correctly evaluated, methods like QFD might help to link conceptual satisfying/dissatisfying feelings with physical design items incorporated into the building. As a firts step it is necessary to identify and assess people satisfaction with their existing housing. There is a need to develop a research method that correlates satisfaction with the present dwelling, residential mobility, and the characteristics of the new dwelling.

This work deals with the analysis of house building customer satisfaction, taking into account not only physical attributes more oftenly related to building performance, but also psychological and socio economic factors.

A satisfaction cycle is proposed, identifying periods of equilibrium and desequilibrium; the latter are associated with the desire to move to a different home. It is taken into consideration that previous experience with dwellings is a strong determinant of how movers perceive quality of their desired new homes.

The methodology was developed and applied in two different stages. Some 340 potential clients were interviewed in a building sales fair, asking how much they were satisfied with their present dwellings and their residential mobility decisions. In this first part it was envisaged to understand how important are the physical attributes of the new dwelling in the mindst of other potentially higher order motives for moving.

The other study was developed through Post Occupancy Techniques, a revealed preference method, with in depth interviews with households that recently moved to a high income new development, with no intention to move in the near future. This second part complements the first, in the sense that now residents are free from potentially higher order mobility motives and might pinpoint in greater detailed satisfying/disatisfying characteristics of their dwellings.

2 The housing satisfaction cycle

A Housing Satisfaction Cycle was developed from the literature. It includes conceptual views such as:
- satisfaction is not a static variable;
- satisfaction is defined as the balance of expectations and performance;
- the perceived quality in other dwellings influences the desired quality for the next dwelling;
- the evaluation of dwelling quality is close to the concept of performance and is assumed to take into consideration tecnical, functional and behavioural aspects.

The influencing factors for satisfaction were classified into five categories [13]:
- Homebuyer decision making determinant attributes – A number of attributes may contribute to perceived quality by occupants, such as materials quality, finishing quality, layout, condominium aspects, location and others. Freitas [14] suggested to arrange these these macro variables into five groups when dealing with appartment building: [i] private area of the dwelling area; [ii] price; [iii] communal area of the block of apartment dwellings [iv] quality of the dwelling; [v] equipments attached to the private area of the dwelling and [vi] location .
- Building and functional aspects – Building aspects are related to technical issues like layout thermal, luminic and accoustical performance, quality and number of outlets in the electric and plumbing installations. Functional evaluation is concearned with accessibility, rooms architecture, security and project flexibility.
- Building developer before and after sales behaviour – Costumers assistance includes a number of stages such as selling, payment conditions bargaining, physical and legal ownership tranferral, and maintenance/support during the occupancy stage.
  Any failure in costumers assistance stage may not only damage company's image but also decrease the final satisfaction.
- Environment and behaviour relations – Include the evaluation of behavioural elements such as privacy, territoriability, social ties and identity, among other elements related to built environment activities.
- Household socio-economic characteristics – The main factors that influence costumer's behaviour include cultural aspects, social aspects, personal aspects, and psychologic aspects, specially social-economic class, life style, personality and family life cycle.

3 Characterization of satisfaction through the residential mobility process

3.1 Metodology

The first part of this study aimed to define satisfaction through residential mobility. The survey was carried out with 340 potential costumers of Florianópolis, a city on the coast of south Brazil.

The interview was divided into three parts:

- social-economic profile of the interviewed person (age, sex, marital status, number of persons in the household, duration of residence, income, income origin, and kind of current residence);
- project macro variables (location, area, number of bedrooms, number of garages, and payment conditions);
- dwelling specific attributes (communal area, quality of the dwelling and equipments).

Also questions about the main reason for this particular intended move and previous move histories were asked.

Reasons for mobility were studied according to classifications defined by Clark & Onaka [9] that consider three categories for moving: [i] adjustment moves; [ii] induced moves; [iii] forced moves.

Forced moves (i.e destruction) were not considered in this study, since they do not characterize the voluntary process of residential mobility. Only adjustment moves characterize the voluntary process in which satisfaction is included as an intervening variable.

Analysis are essentially based on age, income, housing tenure and family life cycle.

3.2 Residential mobility process analysis

The majority of adjustment moves are impelled by physical characteristics of dwelling (40%), followed by moves due to familiar life cycle changes (20%), moves due to rental dissatisfaction (18%), location dissatisfaction (14%) and dissatisfaction concerning neighbourhood environment (8%).

Adjustment moves due to dissatisfaction regarding physical aspects were characterized by the following motivations: quality of the dwelling improvement (31%), easy of operating and maintaining (move from a house to apartment – 30%), privacy (move from an apartment to a house – 22%), security (9%) and communal area (8%). Relations between motivations and age-groups are shown in Figure 1.
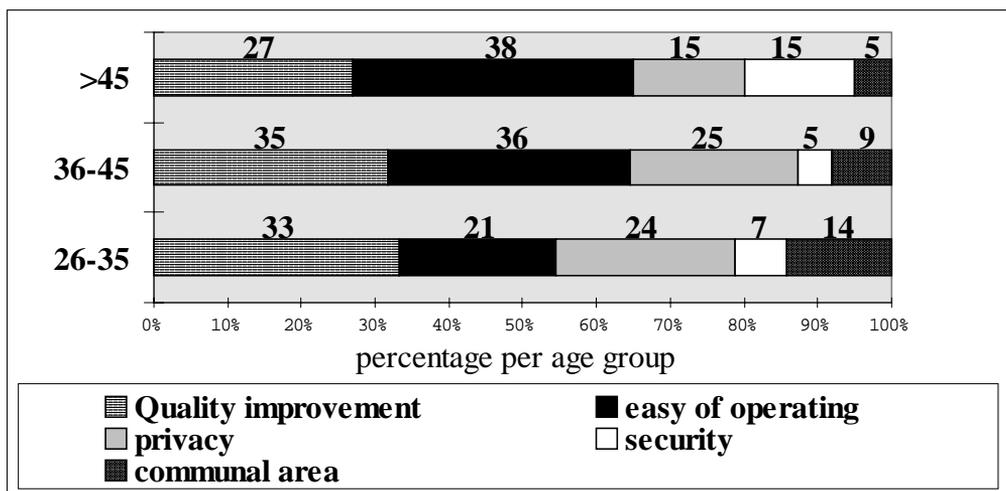

Figure 1 Adjustment moves due to dissatisfaction regarding physical aspects by age group

Quality of the dwelling improvement appears to be a significative worry in all age-groups. Tendencies for moving from a house to an apartment (related to maintenance and operating aspects) are increasingly higher at older age-groups. The opposite tendency (search for privacy through move from an apartment to a house) is more significant at the 36-45 age-group. Security arises as an explicative variable for moves in the last age-group (older then 45). It's also important to say

that even occuring a strong preference for apartments in the whole sample, houses are preferred essentially by people who are moving because of communal area dissatisfaction.

Growing families and contracting families look for more suitable dwellings in connection with greater or smaller private area of the dwelling. It's clearly perceived that the age group of up to 45 years old looks for the increase in space, characterizing the familiar expansion due to birth and growth of children. Among the age-group above 45, decreasing space becomes an explaining variable for moving because of familiar contraction stage (Figure 2).
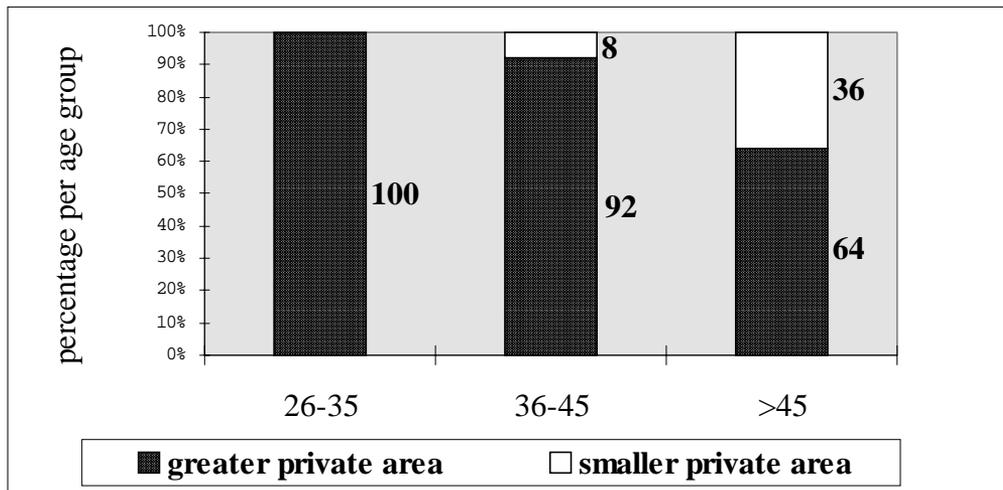

Figure 2 Adjustment moves due to familiar life cycle changes by age group

Motivations for moves concerning ownership are more frequent at intermediate age-groups, becoming less significant to older age-groups (as shown in Figure 3).
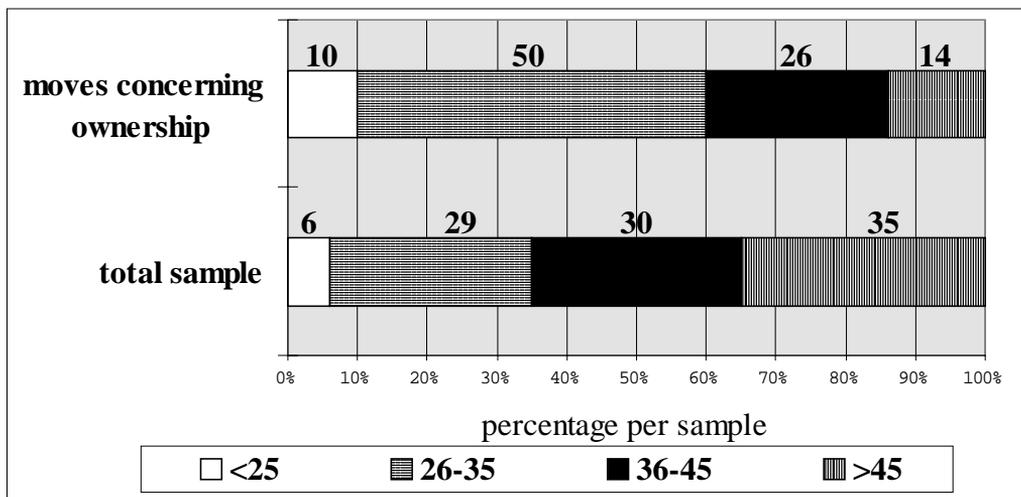

Figure 3 Comparative of adjustment moves concerning ownership sample and total sample by age group

Motivating forces for moving due to location are related to a number aspects such as transportation, social bonds, distance to work, schools and shoppings and others. The sample showed apparent preferences for downtown locations (about 60%), as shown in Figure 4. Dwellers belonging to the 26-35 and 36-45 age-groups preferred downtown location because of the proximity of schools for children and work place , which reduces costs and transporting time. Downtown location was also preferred by the 45 age-group because of the location status and bigger supply of better apartments.
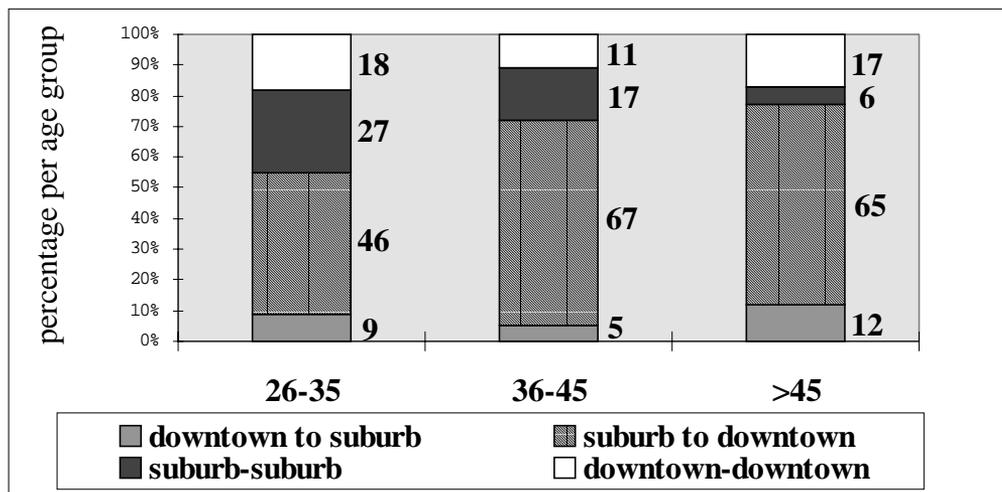

Figure 4 Adjustment moves due to location dissatisfaction by preferences of location

Adjustment moves impelled by the dissatisfaction concerning neighbourhood characteristics were more frequent at older age-groups. About 56% of those who are moving because of neighbourhood, including all age-groups, have their dwellings in downtown (only 24 % of the whole sample have dwellings in downtown). This confirms a correlation presented by Varady [4] which states that there is a stronger tendency for moving (due to neighbourhood dissatisfaction) among people living in downtown location.

4 A case study

4.1 Methodology

The second stage aimed at characterizing an equilibrium period through a case study of a condominium apartment building whose households did not manifest the desire for moving. A post-occupancy evaluation methodology was carried out aiming to evaluate households satisfaction levels [15].

Data collecting was the first step comprising interview with engineer, maintenace and post-selling assistance technicians in order to obtain data about requested items for technical support. All major architectural changes commanded by the occupants during construction were also documented. After that, it was carried out the investigative stage, based on interviews with the apartment building housing manager and building employees. According to the brazilian practice, one of the apartment owners is appointed for a period of one year as the condominium manager, and most developments

have employess like caretakers, guards and porters. Besides, all households were invited to participate in the research. The interviews were registered in writing, and took about one hour each.

The enterprise studied is a one block building, 12 floors, 2 units/floor, high quality finishing with a private area of 120 m^2. Each apartment has 4 bedrooms (one bathroom en suite), a bedroom and toilet for servants. It is located at a very good location place in downtown Florianópolis. About 50% of households belong to the age-group above 45, 30% belong to the 36-45 age-group, and 20% belong to the 26-35 age-group.

4.2 Case study analysis

According to the interviews these are the major conclusions that might be drawn from the data.

■ Building company quality assistance – About 42% of the total amount interviewed reported dissatisfaction with the assistance offered by the company. Dissatisfaction main causes include inability to comply with maintenance due dates and the range of support services available.

■ Homebuyer decision making determinant attributes – It was clearly perceived that housing choices were strongly determined by the location. Secondly, the cases of adjustment moves were motivated by space increase and quality improvement, Previous experience and preferences developed while leaving in previous dwellings along with family life style also influence in a significantly way the decision making process. For many families, how far the most visited places are, and how long it takes to get there are priority aspects.

■ Technical-constructive analysis: The technical evaluation performed by visiting the apartments and going through the maintenance records indicated that the majority of problems were related to the plumbing installations, quality of brickworkmanship, floor tiling, windows, wall rendering, wall tiling, and electrical installation. Notwithstandig this is not the order in which occupants reported dissatisfaction with the physical performance of the building. For them, floor tiling caused the highest level of dissatisfaction, followed by plumbic, bricklyaing, windows, electric installation and wall rendering. However, among usuaries, floor tiling were responsible for the highest level of dissatisfaction, followed by plumbing, bricklaying, windows, electric wiring and wall rendering.

This difference is due to the fact that urging problemas, like leakages and infiltrations, cause dissatisfaction for limited periods, since they are critical while occuring. If these problems are solved, dissatisfaction becomes less evident. Items related to tiling overing, since they are not urgent problems, allow households to live together with them for longer periods, causing long-standing dissatisfaction.

■ Functional analysis – When it comes to the households evaluation of design there is a strong preference for increasing the size of rooms rather than dividing them further. That is, more oftenly two different rooms were put together, rather than the larger ones divided in two. Also, some peculiar adaptations were observed concerning the project's flexibility, according to the family life cycle. For example the servant room is used in different ways, as follows: for growing families, with children up to five years old, this room is used by a baby-sitter (Figure 5); for families with children older than five years old, but still growing, this room is used as a kitchen storage room (Figure 6); for contracting families, it was observed that was used to increase the kitchen area (Figure 7).
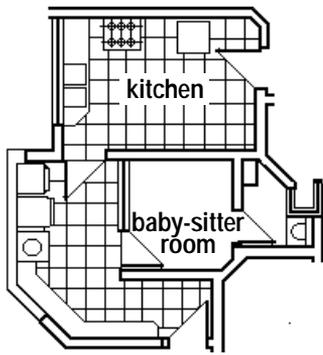
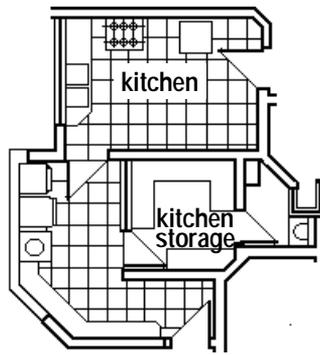Figure 5 - Use of servant room by a baby-sitter

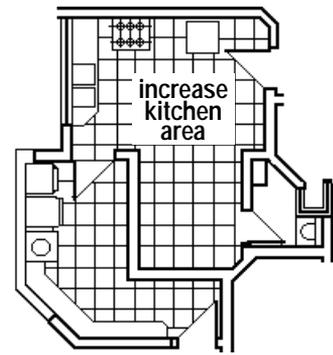Figure 6 - Use of servant room as a kitchen storage room

Figure 7 - Use of servant room to increase the kitchen area

Most of the occupants relate their satisfaction or dissatisfaction with their apartment and the building block to their physical design or constructive aspects. However, administrative aspects played also a predominant role, like the building developer maintenance efficiency and the industrial relation problems with the condominial employees. The interviews were conducted on a non-structured basis, letting the respondents to express freely their experience in living in their dwellings. Most of the time they reported more easily administrative aspects that they were not able to solve than the physical ones. Apparently they felt more able to cope and go along with the later than the former.

5 Conclusions

Although determinants of dwelling satisfaction differ among households with different sizes, social-economic conditions and life cycle stages, the analysis leads to recognize a particular behaviour for households with similar background characteristics. The research effort also helps to establish a hierarchy of determinants of satisfaction. Location, payment conditions and the specific attribute that motivated the move are usually the dominant factors of costumers' satisfaction.

All mobility decisions do not result from an increase in dissatisfaction. In some cases the move occurs by a forced reason like job transfers and marital breakup, as it is normally reported in the literature. On the other hand, not all factors that cause dissatisfaction motivate mobility. The moves are motivated by attributes that can not be adjusted as location, neighbourhood characteristics and cost considerations.

There is a strong relationship between housing needs and family housing carreer, and an association of housing preferences with different life cycle stages.

The knowledge of determinants of built environment customer satisfaction allows improved space utilization, better understanding of consequences of design, feedback on building performance and knowledge about the significance of relationships between the environment and human actions.

The fact that physical of the dwelling itself were frequently cited as reasons for moving and as dissatisfaction factors adds a new dimension for studies in this area. The strong predominance of location and neighbourhood characteristics in this kind of studies as reported in the literature should be balanced with the finer level of detail on housing attributes uncovered by this research work.

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