

Improving residential
environment
appearance
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Improving residential environment appearance is one of the most important aims of urban planning as it is a key factor in citizens' well-being and quality of life. City policy should therefore be designed with this criterion in mind.

However, it is common practice, especially in Spain to embark on urban improvements projects without a systematic study of citizens' needs and preferences. Consequently, resources are sometimes invested in improving aspects that citizens do not perceive as important.

In times of economic crisis like the present, it is therefore particularly necessary to have tools that can include citizens' opinions in the urban development process. This approach would enable urban managers to ensure that scanty available resources are invested in aspects that can increase citizens' satisfaction.

But, what attributes does a neighbourhood need for citizens to evaluate it positively? Understanding the cognitive factors behind citizens' evaluation of their city or neighbourhood is a complex process that requires the interrelation of different areas of knowledge such as psychology and town planning.

Many studies in these areas have attempted to analyse the psychological factors behind citizens' evaluations of different neighbourhoods.

Thus, environmental psychology studies have measured people's perceptions and cognitive evaluations of specific features of the residential environment at neighbourhood level, with different outcomes. Küller (1980; 1991) determined eight perceptual qualities as a means to characterise

architecture and the built environment: pleasantness, complexity, unity, enclosedness, potency, social status, affection, and originality. Bonaiuto, Fornara and Bonnes (2003) presented an instrument, formed by 11 scales, able to measure the perceived environmental qualities of urban neighbourhoods. These scales were grouped into four general relevant areas: spatial aspects, human aspects, functional aspects and contextual aspects. Amérigo and Aragonés (1988) did a qualitative study based on semi-structured interviews with forty-nine individuals resident in Madrid (Spain). The interviewees described the positive and negative aspects of their ideal neighbourhood, to provide the following relevant categories: social problems (drugs, begging, prostitution, illiteracy, social exclusion); public services, (drains, street lighting, cleaning, transportation); social services (health centres, hospitals, libraries, homes for the elderly); construction (pavements, urban furniture, squares, pedestrian zones) and green spaces (the presence of parks and gardens).

The fields of architecture and town planning establish a relationship between the quality of an urban community and its physical form, in order to develop an understanding of the social, psychological, and physical elements that contribute to a quality community. Appleyard (1981) researched the quality of life in residential environments and found that residents structured their values in four principal dimensions: the street as sanctuary (clean, quiet, maintained, attractive, safe), child-rearing, accessibility, and neighbourhood identity. Lynch (1981) distinguished five categories that a “ good city form” should have. These categories are: vitality (a healthy environment), sense (sense of place or identity), fit (a setting’s adaptability), access (to people,

activities, resources, places, and information), and control (responsible control of the environment). Lennard (1987) suggested that successful design of urban spaces promotes social life and a sense of well-being. Lang (1994) used the five sets of basic needs identified by Maslow (1943): physiological needs (the need for survival, health, development and comfort), safety and security needs, affiliation needs, esteem needs, and self-actualization needs (including cognitive and aesthetic needs). Jarvis (1993) found opposing qualities of desirable places to live: convenience-separation; relatedness- identity; affordability- luxury; tradition- innovation; unity- variety; safety- excitement. Smith, Nelischer and Perkins (1997) identified quality principles that an urban environment should fulfil. Important elements are livability, character, connection, mobility, personal freedom and diversity.

These works analyse the relationship between the attributes of a neighbourhood or area and citizen' responses, considering the relationship as linear. Linear scales having typically 5 or 7 grades varying from not important to very important are often used. These kinds of measures imply a presumption of linearity. That is, it is assumed that citizen satisfaction increases or decreases more or less linearly as an area's attributes improve or worsen. On this basis, urban managers' decisions would aim at improving all the attributes which are deficient.

However, attributes may not always be uniform in their ability to create satisfaction or cause dissatisfaction. The environmental literature shows that the relationship between user response and stimulus properties is not necessarily linear. Thus, Wohlwill (1975) found an inverted U relationship
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between rated pleasure and rated diversity for pictures of environments and pictures of stamps. In a previous study, the same author (Wohlwill, 1968) also found an inverted U function between preference and rated complexity using scenes of environments and pictures of nonrepresentational art as stimuli.

Under this hypothesis of non linear behaviour, analytical techniques are needed to measure the different impact of attribute-level performance on overall satisfaction.

Quality Management studies have been working in this line for years. Thus, Kano's Model, (Kano et al., 1984) provides a non-linear treatment of the importance of individual product attributes for customer satisfaction. This model states that satisfaction and dissatisfaction are two independent concepts in the minds of consumers and should be considered separately. Thus, a product will cause more or less satisfaction or dissatisfaction depending on whether certain consumer needs are completely, partially or barely fulfilled.

In Kano's Model, quality attributes are grouped into three categories with a different impact on customer satisfaction; basic attributes, exciter attributes and linear attributes.

Basic factors are minimum requirements that cause dissatisfaction if not fulfilled but do not lead to customer satisfaction if fulfilled or exceeded.

Therefore, the fulfilment of basic requirements is a necessary, but not sufficient condition for satisfaction. Exciter factors increase customer

satisfaction but do not cause dissatisfaction if they are not delivered. This <https://assignbuster.com/improving-residential-environment-appearance-marketing-essay/>

type of attribute is the product criteria with the greatest influence on how satisfied customers are with a given product. Finally, linear or performance factors lead to satisfaction if performance is high and to dissatisfaction if performance is low. Although linear attributes can be measured by traditional techniques, the identification of basic and exciter factors requires a special technique.

Kano's Model has been applied in many different fields demonstrating the coexistence of linear and non-linear attributes. Some of these applications can be found in the automotive industry (Matzler et al., 2004), hospitals (Chen & Sun, 2006), logistics customer service (Huiskonen & PirttÄ"llä, 1998), web-community service (Kuo, 2004) and real estate promotions (Llinares & Page, 2011). Until now, however, no studies have applied this technique to the definition of urban development strategies.

The main advantage of this technique is that it provides information on the behaviour of the variables, facilitating strategy definition and the prioritisation of investments, which is fundamental when financial resources are scarce as they are in Spain at the moment. Firstly, therefore, urban managers should try to cover the minimum acceptable level of basic and linear attributes, as any shortfalls can generate dissatisfaction. Then, they should focus on improving linear and exciter attributes, where any improvements will generate satisfaction. Finally, it is important to bear in mind that there is no need to invest in improving must-be attributes which are already at a satisfactory level, because citizens will not value further improvements.

Following this approach, this paper aims to present a method for defining strategies that improve perception of the residential environment using Kano's classification. First of all, the study defines the attributes citizens use to describe neighbourhoods, classifying them according to Kano's model (into basic, linear and exciter attributes), and then defines action strategies.

2. MATERIAL AND METHODS

The field study was conducted in the city of Valencia (Spain) (Fig. 1), a medium-sized city on the Mediterranean coast. All the neighbourhoods within the metropolitan area were analysed according to the classification established by the City Council.

2. 1. Subjects

153 individuals participated in the field study (Table 1), all employees at the Universidad Politécnica in Valencia. This sample is representative of a market segment with medium-high purchasing power and stable employment. Differences in gender, age and professional category are due to the fact that the sample was randomly selected. Sample size was chosen with the criterion of a minimum of 6 observations for each variable to be included in the factor analysis, indicated as sufficient in Field (2005). In our case, this figure totals 354 observations/recordings (6×59 variables for the factor analysis). As each individual assessed 3 questionnaires at least 118 individuals had to participate.

2. 2. Stimuli

The set of stimuli used for the field study consisted in a total of 74 images of the different neighbourhoods in the city of Valencia. As the objective is to

gather citizens' opinions and perceptions, the individuals had to recognise the area after observing the stimulus. The subjects only gave their evaluations of the areas they already knew. To facilitate recognition of the area, each stimulus contained the commercial name it is popularly known by. Figure 2 shows an example of the stimuli used.

2. 3. Questionnaire

The questionnaire had to reflect a set of expressions or adjectives that describe citizens' emotional response to the city's neighbourhoods. The study followed the process established by Schütt, Eklund, Axelsson and Nagamachi, (2004) to obtain these adjectives. The first step was to collect as many words and expressions (in Spanish) as possible that people use to express neighbourhood attributes to obtain the most comprehensive semantic description possible. These adjectives were collected from different sources such as internet, newspapers, journals and professional magazines, etc. This phase gave a total of 126 expressions, too many to include in a questionnaire, so the next step was to reduce that number using the affinity diagram technique (Terninko, 1997). This technique consists in forming groups of similar words and assigning one relevant word to represent all the words in the group. The affinity diagram reduced the initial list to 59 adjectives. Finally, we included a variable which reflected the global evaluation of the neighbourhood from the expression " Globally, I think it is a good neighbourhood". A 5-point Likert scale was used for evaluating each neighbourhood from: totally disagree, disagree, neutral, agree, totally agree.

2. 4. Development of the field study

Interviewees were informed of the study objectives and asked to evaluate each neighbourhood using the questionnaire described in Section 2. 3. A previous pilot study showed that an interviewee could reply to a maximum of three questionnaires before losing interest, therefore each subject evaluated only three neighbourhoods. Some interviewees asked to fill in only 2 questionnaires due to lack of time, making a total of 426 completed questionnaires.

2. 5. Data processing

The procedure shown in Figure 3 was applied to the database of responses. Statistical analyses were carried out using the statistical package SPSS. 16. 0.

Obtaining a set of neighbourhood perception attributes

Principal components factor analysis provided the set of independent concepts or semantic axes which citizens use to describe their sensations in relation to the city's neighbourhoods (Basilevsky, 1994; Flury, 1988). We selected only principal components with eigenvalues greater than one, and used a further Varimax rotation to obtain the semantic axes factors. Finally, internal consistency of the dimensions was evaluated by Cronbach's Alpha coefficient (Streiner, 2003).

b. Classification of attributes according to Kano's Model and sample evaluation

b. 1. Application of Kano's Model

Kano's model (Kano et al., 1984) of customer satisfaction proposes classifying quality attributes into three categories with a different impact on customer satisfaction: basic or threshold factors, exciter or delighter factors and linear or performance factors. As Figure 4(a) shows, in the original model the curves represent the relationship between the level of attribute implementation and overall user satisfaction. According to the original Kano's model the subject is asked two questions about each quality attribute. The first question concerns the individual's reaction if the product has that attribute; the second concerns his reaction if the product does not have that attribute. This study considers a modification to this model (Llinares & Page, 2011). We identify indirectly the presence (positive attribute-PA) or absence (negative attribute-NA) of an attribute in relation to factor scores. Then, Spearman's correlation coefficients were calculated between the factor or attributes when present or absent and the global evaluation variable, providing two correlation coefficients, one in the negative region of the attribute (RNA) and the other in the positive region (RPA). These correlation coefficients were used to classify the attributes into three categories: basic attributes, when the correlation is positive in the negative zone and null in the positive zone, linear attributes when both correlations are positive and exciter attributes when the correlation is null in the negative area and positive in the positive area. Figure 4(b) shows the contingency table with the possible combinations and graphic representation of the pairs of values. The "negative answers" and "positive answers" axis

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shows the relationship between the factors or attributes and the global evaluation of the neighbourhood when the attribute is absent (NA) or present (PA) respectively. The principal advantage of this model in comparison to the original one is that it avoids bias in user response as users are not forced to explicitly define the relation between the presence or absence of an attribute on the global evaluation. Thus the relation between attributes and overall satisfaction is merely statistical.

b. 2. Sample evaluation by perception attributes

According to Kano it is important to know the typology of each attribute in order to analyse the behaviour of the variable in relation to citizens' global evaluations. This information, however, is not sufficient, as it is also necessary to know the level of implementation of the attribute in the city in order to define strategies. So, with Kano's Model we would know, for example, that a given attribute is basic and must therefore be present otherwise its absence would generate dissatisfaction. But, which particular neighbourhoods lacked this basic attribute and therefore what neighbourhoods generated dissatisfaction because this attribute was missing? Therefore we obtained the evaluation of the neighbourhoods in relation to the attributes by differentiating three blocks: above average evaluations in comparison to the other neighbourhoods in the city, evaluations around average and below average.

Definition of strategies to improve residential environment perception

Comparison between the degree of implementation of the attributes in the city and the importance users assign to them in accordance with Kano's

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classification, makes it possible to define urban investment strategies. For this purpose, we made a double entry matrix with the 6 possibilities. This positioning matrix was proposed by Huisken and Pirttälä (1998) to classify service elements. Figure 5 shows an adaptation of this matrix for the urban sphere.

The matrix provides very valuable information for defining and hierarchising investment strategies. Thus urban managers could define the following action plan:

Investment strategies firstly should cover “urban weak spots” that is, the linear or basic quality attributes with below average evaluations, as the absence of these attributes is generating dissatisfaction. Then, there could be investment in “improvement opportunities”, that is, in linear quality or exciter quality attributes valued neutrally by citizens but which, if improved, would also cause satisfaction.

Maintenance strategies: basic quality attributes with average evaluations should be maintained because any reductions in level could generate dissatisfaction. In addition, the level of exciter or linear quality with above average evaluations should also be maintained.

Non investment strategies: it is unnecessary to invest in improving exciter attributes with poor evaluations as improvement will barely be perceived.

Non investment/disinvestment strategies: no investment is necessary and resources allocated for improving basic quality attributes with above average

valuations could even be transferred, as this high level does not influence citizens' evaluations.

3. RESULTS

Obtaining a set of neighbourhood perception attributes

Factor analysis reduced the original set of 59 adjectives to 10 uncorrelated factors which explained 61.17% of the variance in the original variables.

Table 2 shows the selected factors, their correlations with the original adjectives and the percentage of explained variance. Conceptually, axis 1 corresponds to emblematic, unique and special neighbourhood with emblematic, unique, special, unrepeatability and characterful as main concepts. Axis 2 comprises, with positive correlations, the adjectives luxury, prestige, no safety problems and with negative correlations, the expressions with immigrants, multicultural, decaying and deteriorated. It is related to the concept of luxury and prestige neighbourhood. Axis 3 determines big open spaces, with wide, easy and fast access routes, good urban planning and with wide avenues. Axis 4 corresponds conceptually to expanding and forward looking of the area. Axis 5 represents the dimension youthful, vital and cheerful area with the main adjectives being youthful, vital, cheerful, plenty of nightlife and carefree, lively and dynamic and with leisure and entertainment services. Axis 6 contains friendly and welcoming, peaceful, pleasant, agreeable, feeling of community, with quality of life and with a wide choice of schools. It is the friendly, peaceful and pleasant axis. Axis 7 refers to noisy and with heavy traffic area. Axis 8 represents the dimension good accessibility with the adjectives with good transport links, with opportunities to walk, bike and drive, easy to reach the workplace and well

located. Axis 9 represents commercial and business area with the adjectives commercial, with good shops and business area. Finally, axis 10 represents the good facilities dimension with the expressions good sports facilities, pedestrian areas, with parks and leisure areas and with catering facilities, infrastructures and services. Cronbach's Alpha values for 10 dimensions ranged from 0.679 to 0.896, showing that these scales have considerable reliability. According to Hair, Anderson, Tatham and Black (1998) Cronbach's alpha below 0.6 shows an unacceptable level of reliability in exploratory studies.

b. Classification of attributes according to Kano's Model and sample evaluation

b. 1. Application of Kano's Model

We first obtained Spearman's correlation coefficients between the 10 axes and the global valuation variable differentiating between two sections: implemented attribute (positive valuation- RPA) and non-implemented attribute (negative valuation- RNA) (Table 3). Comparison of these two correlations ($p < 0.05$) makes it possible to assign the linear, basic or exciter quality to each attribute (Fig. 6).

Linear attributes are characteristics which lead to satisfaction if performance is high and to dissatisfaction if it is low. Both satisfaction and dissatisfaction are possible, and customer reaction depends more or less linearly on the level of the attribute offered. Thus as perception of the area as friendly, peaceful, expanding and forward-looking increases, its global evaluation improves and vice versa.

Basic factors are minimum requirements that cause dissatisfaction if not fulfilled but do not lead to customer satisfaction if fulfilled or exceeded; these are characteristics that the user expects a product to have, and when they are not present they generate enormous dissatisfaction. Thus the fact that an area is perceived as having poor accessibility has a negative impact on the global evaluation. However, this influence is not maintained for all levels of the variable. When a neighbourhood has an average level of accessibility, increases in quality do not improve the area's global evaluation. These attributes can negatively differentiate an area, but improvements above a threshold level are not worth introducing because they would not improve the global evaluation. The same is true for the attribute of the area as being emblematic and singular, youthful and vital. These axes, however, do not have a markedly basic attribute as they are very close to other areas (youthful and vital close to the area of "linear attributes" and emblematic close to the area of "no influence").

Exciter factors correspond to characteristics that customers do not expect and therefore their absence does not produce a negative evaluation. In contrast, if they are present, they generate enormous satisfaction. In this case the correlation between variables in the negative area (RNA) is not significant, in other words, if the property is perceived as not having a luxury and prestige aspect it would not carry a negative evaluation. In contrast, correlation in the positive area (RPA) is significant, so the presence of this attribute does have a positive influence on the global evaluation.

Finally, other attributes form part of "the area of no influence". They are attributes with no significant effect on the global evaluation of the

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neighbourhoods. The factors in this group are wide and landscaped, with traffic, noise and works, commercial and business and good facilities and equipment.

b. 2. Sample evaluation by perception attributes

We obtain the evaluation of city neighbourhoods for each of the attributes identified as relevant in Kano's Model. We distinguish three blocks: above average evaluations in comparison to the other areas in the city, evaluations around average and evaluations below average. Figure 5 is a graphic representation of the evaluation of the set of attributes.

Definition of strategies to improve residential environment perception

With this information (classification of attributes according to Kano-evaluation of the sample) we made the positioning matrix mentioned in Section 2. 5. c) (see Figure 8).

The information structured in the positioning matrix enables consideration of urban improvement strategies. In this particular case, the following action plan would be advisable.

Investment strategies (Fig. 9): should cover "urban weak spots" first of all. Thus, some areas of the city are generating dissatisfaction because they are perceived as noisy, youthful, expanding or emblematic. The next step would be to invest in "improvement opportunities". Improving the perceptions of quiet, expansion and luxury in some specific neighbourhoods would help to increase citizens' satisfaction.

Maintenance strategies (Fig. 10): the implementation levels of attributes “ of an emblematic nature” and “ good accesibility” in some neighbourhoods must be maintained, because if they worsened it would generate dissatisfaction. Furthermore, it would be necessary to maintain the city’s “ strong points”. As figure 10 shows, some neighbourhoods are perceived as “ quiet”, “ expanding” and “ luxury” and these levels of implementation generate citizen satisfaction.

Non investment/disinvestment strategies (Fig. 11): urban managers should bear in mind that it is not necessary to invest in improving the perception of luxury in some neighbourhoods, as it is an exciter attribute and so its absence does not generate dissatisfaction (Fig. 11(a)). Furthermore, it is not necessary to improve the image of “ youthful, emblematic and good accesibility” in some areas as citizens would not appreciate such improvements (Fig. 11(b)). Thus, resources could be used to improve other neighbourhoods.

4. DISCUSSION

The purpose of this paper is to present a method for defining urban management strategies that improve residential environment perception. This method is based on Kano’s Model, a technique able to measure the different impacts of attribute-level performance on overall satisfaction. This type of tool may be very helpful for urban managers by providing information on urban improvements that are able to increase citizen satisfaction.

As mentioned in the introduction, many studies, in the field of environmental psychology and architecture and urban development have analysed the set of attributes in a neighbourhood or area that are able to increase citizen satisfaction. However, these studies consider that the relationship between these variables (attributes-citizens' response) is linear, that is, that citizen satisfaction increases (or decreases) more or less linearly when the level of any attribute is improved (weakened). Thus urban managers will decide to invest in all attributes with low levels of implementation. However, attributes may have a nonlinear pattern and so resources may be squandered on investing in attributes where citizens do not perceive improvements. This work considers the use of Kano's Model to analyse nonlinear behaviours which will help urban managers to define investment strategies for improving urban appearance. Although these techniques have been used to classify service elements (Huiskonen & Pirttälä, 1998), this is the first time they have been applied to the urban sphere. This tool may be particularly interesting in periods of crisis by ensuring that the scanty available resources are invested in aspects that will improve citizens' satisfaction.

The results confirm the initial hypothesis that the relationship between an urban area's attributes and citizens' evaluations is not linear. This finding has been demonstrated by the application of Kano's Model (Kano et al., 1984) (Table 3 and Figure 6). Kano's Model classified the 10 dimensions or factors obtained from factor analysis into three types: friendly-peaceful and expanding- forward looking as linear attributes; emblematic- singular, good accessibility and youthful-vital as basic attributes and luxury- prestigious as exciter attributes. These findings demonstrate the need to apply this type of

technique. Traditional techniques are able to identify linear attributes but not basic and exciter factors.

In this work a correlation analysis with dummy variables is used to measure this asymmetric relationship. Thus, this paper proposes a modification of the original Kano's model, in which the client was asked directly about the effect of having or not having each quality attribute, replacing it with indirect analysis where such questions are not necessary. The advantage of the modification to Kano's Model is that it avoids bias in user response.

Interviewees are not obliged to explicitly define the relation between the presence or absence of an attribute and the overall evaluation. In fact, users do not have to consider at any moment the way in which each attribute influences the global evaluation as that is done afterwards in the statistical analysis.

In addition to Kano's model classification, it is fundamental to know citizens' levels of satisfaction for each attribute. Thus, basic attributes such as good accessibility and youthful are decisive if performance is low, but unimportant if performance is high. Exciter attributes such as luxury and prestige are important if performance is high, but are not relevant when performance is low. Linear attributes such as friendly, peaceful and expanding and forward-looking are important when performance levels are high or low. The advantage of the proposed method is that strategies can be prioritised as there is greater understanding of the nature or behaviour of an area's attributes. The positioning matrix (Fig. 8) is a fundamental tool for decision making as it provides information on where to direct efforts with the aim of improving an area's global evaluation. If this non linear behaviour is not

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taken into account, the wrong decisions could be taken, for example investing in improving basic quality attributes with an already acceptable level or improving exciter attributes where implementation levels are low.

The results of this study are difficult to compare with other studies as no previous studies have applied Kano's model to evaluate attributes related to urban appearance. However, it is interesting to contrast some of the findings with previous works. The attributes of perception correspond to attributes identified in previous studies. Thus, for example, the attribute "friendly and peaceful" appears in this work as a linear attribute. This factor includes the components "friendly and welcoming" and "feeling of community" identified as important elements in residential satisfaction in previous studies (Amérigo & Aragonés, 1997, Küller, 1980). Lennard (1987) also pointed out that an area's success depends on its ability to generate the sensation of wellbeing. The other linear attribute "expanding and forward-looking" is characteristic in Spain where it is traditionally assumed that, after making the effort to buy a property, it will become a valuable asset after only a few years. This speculative approach has changed significantly in recent years. Thus between 2002 and 2007 average house prices in Spain increased by 68. 2%, but have since fallen by 23. 5%. The exciter factor, "luxury and prestige" is also relevant in other studies (Jarvis, 1993). In our case, however, this factor includes a variety of aspects such as "with no safety problems" (relevant in the studies by Ge and Hokao (2006), Jarvis (1993) and Lang (1994)) and "not marginal, no immigrants". This last aspect may also be characteristic of the study country, due to the gradual increase in the number of immigrants in Spain in recent years, especially in the city of

Valencia. Basic quality attributes include “ good accessibility”, identified as relevant in previous works (Apleyard, 1981; Smith et al., 1997; Türkoglu, 1997). “ Youthful, vital and cheerful” can be compared to “ vitality” identified by Lynch (1981). The factor “ emblematic, unique, unrepeatabe” has also been identified as relevant in other works, under the name “ sense of place” (Lynch, 1981, Smith et al., 1997).

It should be pointed out that once the strategies have been defined, improvements in attribute perceptions must be made on the design characteristics which cause these subjective perceptions, that is, the design elements causing the different emotions must be identified. This information can be obtained using kansei methodology (Nagamachi, 1989; 1995) which c