Propagating Behavioral Architecture-Based Researches: Methodological and Conceptual Issues

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Abstract

Architectural practice world over emphasise the ingenuity of space organization and technical presentations of such organized spaces. This is prevalent either in theory in our schools of Architecture, practice and/or both. More often than not, the human angle of architectural design and even research is not given equal emphasis as the design approaches. The best human design involvement is the taking of briefs from clients, which is not sufficient in dealing with congruency that the design outcome ought to engender between the person and the built environment. Our research approaches with regard to the architectural space is equally tailored towards the same direction as the design approaches. The human aspect in our architectural based researches is deemphasised. This conceptual paper aims to market and propagate a human factor based means-end chain (MEC) model that has the capacity to measure both the aggregate architectural issues and the complexities of the behavioural and perceptual orientations of the users of the architectural space for researchers. The conceptual framework will focus and highlight the housing environment. The methodology that the MEC

model uses is called Laddering one-on-one interview technique, which is qualitative in nature. Research outcomes from this model will not only be relevant to the academic platforms, but can be commercialised by practitioners in the building industry. If we must have a sustainable built environment in the 21st century and beyond, our architecture based researches must emphasise person-environment congruent based researches as well. There are a lot of potentials using this research model available to the built environment researchers.

Introduction

This paper reviews various literatures that established the theoretical and conceptual frameworks within which the study has been underpinned. It establishes and clarifies the models that were employed for the study. It also gives the outline of the means-end chain (MEC) model and stated housing preference and housing choice (SHPHC) models that were used for the study and also suggest an extension to the traditional MEC models which was tested for this study.

The need for housing remains a constant index for all societies through the ages. The need for shelter just like for food, clothing and health are universal. The importance of housing to the wellbeing of an individual within a society cannot be overemphasized. It is extremely very vital. Housing or lack of it has a multiplied effect on a person's general outlook and consequently on the society where he lives. Ranson (1991, p. 1) assesses that throughout the time mankind came into existence, the demand for sufficient safe haven to live has been his concern.

Housing need and human needs are intertwined. Human needs are the motivations for any aspiration in life including housing need. Harms (1982 p. 19) posits that these needs dominate most people's lives and the reproduction processes of the workforce and their families in all societies. He argues that the way in which these needs are fulfilled varies markedly. Abraham Maslow developed a human needs' related model called "Maslow Hierarchy of needs"

in 1954 which profiled the needs that the entire human life grapples with. His concept gives the understanding of theoretical framework of human needs that serve as motivation for action courses in choices and preferences in life, and people are usually motivated by these needs to make choices and preferences. Shi Lin (2006) posits that this hierarchy of human needs explain human motivations which are adapted by many disciplines including housing studies. Maslow's model outlines fundamentally two groupings of human needs as "deficiency needs" and "growth needs". It is a pyramidal presentation of conceptualizing the human needs, which is in an ascending order in the pyramid. Huitt (2004) summarizes the model like this:

i) The first level in the pyramid of these needs is the deficiency needs made of:

    a) Physiological: hunger, thirst, bodily comforts, shelter, sleep, etc;

    b) Protection/Security: protection from danger, stability, etc;

    c) Belongingness and Love: need for association, be acknowledged by others, family love, network connection;

    d) Respect/Esteem: to accomplish, be capable, gain endorsement and appreciation, self-esteem, mastery, independence, status, prestige, etc.

ii) The second level is growth needs of Self-Actualization which include:

    a) Cognitive: to be acquainted with , to comprehend, and be on a discover voyage, to learn, create, etc;

    b) Aesthetic: equilibrium, organize, and attractiveness, be admirable, etc;

    c) Self-actualization: to self-discovery and become conscious of one's potential, seeking personal peak experience; and

    d) Self-transcendence: to attach to incredible past the personality or to assist others discover their potentials and realized their possibilities (Huitt, 2004; Bluyssen, 2009)

Figure 1: Maslow hierarchy of needs model (Source: Zinas, 2012)

Relationship between Maslow model of human needs and Housing environment

Housing can make a person have a comfortable environment as well as making him secured, not only

form physical enemies that endeavour to invade him, but also from hazardous environmental conditions. Broad (2004) posits that apart for shelter from the weather, home guarantees a safe haven, the centre for livelihood of members of the family, a pedestal for occupation and leisure, and a place to withdraw and freedom from the confusion of the outside world. He further stresses that the place to live is not merely an expenditure article, but a fundamental driver of financial progress and service. Coolen (2005) reveals that an abode is a person's chief security from the surrounding environments. Housing is vital and cardinal in meeting the needs of man, which can parallel the human needs in general as profiled by the Maslow's model of human needs.

The first rung of Maslow's hierarchy of human needs (physiological) which specifies the need for oxygen, welfare, need for water to drink, protection, warmness, sex, need for rest in sleep, has direct link to "controlling our thoughts and behaviours" according to Bluyssen (2009, p. 154). She posits that if these needs are not fulfilled, it has a tendency to make people feel sick, pained, and discomforted in their body. If the physiological needs of the housing indoor parameters are not made, it will make people to have health problems. Roske (1983) assesses that housing provides a person satisfaction of his basic needs, in addition to providing him with shelter. These basic human needs can be linked to specific aspects of housing. With respect to security needs, Bluyssen (2009, p.154) asserts that when the physiological requirements are met, the requirement for protection and refuge come into view. The interior setting provides the necessary protection from rain, wind, noise from outdoor, and cold/heat, as well as security from unwanted intruders and enemies. It secures your property and keeps them safe.

Belongingness and love needs spring from the desire to have family affection, relationships, and social acceptance. Bluyssen (2009, p.155) asserts that people should feel a sense of belonging and acceptance, whether it comes from a well-built social network or a less important social connection; they need to love and be loved by others. She assesses that without these connecting social networks, individuals become vulnerable to being alone, socially secluded, and social anxiety and can get into depressive situations. Housing interior finishing can be made in a way as to attract and keep you connected to these social networks. The indoor environment can be organized to endear and attract people to you which will address the need for belongingness and love. Housing will endear a person to others favourably by accepting him and esteeming him.

Housing has a tendency to define the "status" (Coolen, 2005) of a person in the society, which is one of the things that esteem needs seek to achieve. People deserve respect which stems from both self-respect and public respect; they act and comport themselves in such a way as to earn recognition and to "feel accepted and self-valued" (Bluyssen, 2009, p. 155). If esteem need is out of balance in the life orientations of people, according to Bluyssen (2009, p. 155), it will lead people to "low self-esteem, inferiority complexes, or snobbishness". When the need to be esteemed is achieved, it makes people to have confidence and competence, and feel some sense of achievement. Housing indoor environment where we spend "nearly 16 hours per day" (Bluyssen, 2009, p. 95) has a role to play in generating and fulfilling our quest for esteem, either personally or publicly. The way and materials with which housing interiors are finished can make people that visit our home to esteem us or not.

Cognitive needs stem from the quest for man to search for knowledge, engaging himself in learning, exploring, discovering, and creating in order to gain a better understanding of the world around him. According to Bluyssen (2009, p.155), the indoor environment can provide the platform and the occasion to study rather some new things by creating a place to watch television, occupy oneself by reading, and even explore through the internet. How comfortable and conducive the housing indoor environment has been finished will guarantee the achievement of this self-development need.

Aesthetic needs address the need for appreciation, search for beauty, form and balance. It is a common notion that everybody appreciates and likes beauty, and it is satisfying when there is an expression of beauty around us. Among many things that convey aesthetics, housing interior finishes is one of them, which can be created to be aesthetically pleasant. Bluyssen (2009, p.155) reveals that the selection of colours, and finishes materials, in the interiors are important to aesthetics needs. People need aesthetically beautiful images or some new things as well as pleasant things in order to approach self-actualization.

The need for self-actualization in the society is cardinal to people's fulfilment in life. Humans endeavour to realize their inherent potentials, self-fulfilment, personal growth, and peak experiences which Bluyssen (2009) describes as "a direction to achieving personal augmentation, integration and accomplishment". When housing interior finishes are created, it can generate and satisfy the need for self-actualization, where people feel 'on top of their world' described by Bluyssen as "peak experiences". It will make housing

owners fulfil their potentials and be fulfilled in life. It is a self-discovery adventure need, which the indoor space can achieve.

Self-Transcendence needs seek to be a role model to others, and motivating and helping them to achieve in life. Housing has an import in meeting this particular human need. The way the housing interior is finish will generate interest in others, and they will strive to have their own housing interior finishes in like manner. Even on a commercial and housing consumer level, the way the interior finishes are done will attract potential prospects that the finishing meets their expectations. All these are geared towards motivating others to achieve their desired dreams.

In summary, housing need and human needs as outlined by Maslow Model cannot be disconnected from one another. They are interrelated and interconnected. Housing indoor environment has a powerful linkage with meeting these human needs, and a person chooses housing interior finishes attributes with the aim of satisfying these needs. Bluyssen (2009, p. 156) posits that it is essential to be familiar with the requirements of occupants of certain interior spaces in order to be able to set the performance criteria of such a situation.

LITERATURE REVIEW
Influence of housing norms on housing choice and preference
Housing norms have both objective attributes and subjective dimensions, because they express the physical elements of the built environment as well as the behavioural components in relating and dealing with these physical elements. According to Tremblay and Dillman (1983 p.114), housing preference can be partially explained by a consideration of four housing norms, namely, home ownership, single family detached dwelling, private outside space, and conventional construction. It is only during the choice and preference making processes of housing objective attributes that the subjective dimensions of choice behaviours can be disentangled. There is therefore a strong linkage between housing norms and housing choice and preference.

Housing Features Alternatives Preference and housing use and meaning
Use gives meaning to housing, and at the same time meaning guides how housing is used (Arias, 1993). Various researchers (Despres, 1991; Moore, 2000; Mallett, 2004) have studied the meaning of dwelling features from

different perspectives like psychology, phenomenology, sociology and environment behaviour studies. Arias (1993) contend that housing preferences affect directly, and are directly affected by the meaning and use of housing. However, drawing insights from various researchers (e.g. MacLennan and Williams, 1979; Drake, 1984; Rapoport, 1985 and Arias, 1993, p.170) assessed that housing preferences are still poorly comprehended in architectural theory and practice. Struder (1993, p.29) sees "meaning" and "use" as connoting conceptually distinct phenomena, although functionally interdependent. He defines "meaning" as "an attribute of an object or idea that makes it of emotional value or concern, arousing in a person or persons, certain associations, cognitions or effects"; while "use" as "overt behaviour, the employment of objects or ideas to facilitate an action".

Coolen (2008, p.1) views "meaning" as being central in environment-behaviour studies; because, according to him "meaning links the built environment and people". He further argues that with respect to people's relationships to dwellings, meaning provides much of the rationale for the ways in which these dwellings are shaped and used. Meesters (2009 p.1) reveals that the meaning of dwelling is a central setting in people's everyday life. She distinguished four diverse meanings that may be attached to a dwelling as firstly, functional meaning (e.g. having a roof over one's head); secondly, social meaning (e.g. being together with family or friends); thirdly, an indicator of one's position in the society; and fourthly, as an economic investment.

Struder (1993) argues that "meaning" on a philosophical domain is highly ambiguous, and operate on four pivotal senses as involving:

i) Intention or purpose; ii) Designation or reference;   iii) Definition or translation; iv) Causal antecedents or consequences.

He argues that 'meaning' and 'use' are intertwined, and continues to give different functional behavioural aspects of "meaning" and "use" of dwelling. He states: "it would be convenient to look at 'use' as manifesting *effective behaviour*, and 'meaning' as manifesting *affective behaviour*". Bluyssen (2009, p.130) calls "affective behaviour" as 'affective appraisal' which he explains to mean: "judgement of things as pleasant, affective, valuable, likeable, preferable, and repulsive". These behavioural manifestations are either being expressed in perceptual, affective or symbolical sense (Struder, 1993). He adds that an individual's, a family's, or a group's most salient and intimate experience vis-

a-vis meaning and use is no doubt manifest within the boundary of the dwelling place (p.31).

The meaning ascribed to housing space by users has both functional and psychological dimensions of the space. The housing space is made of different features which housing dwellers will normally choose from, for the making of their dwelling spaces; and these features are the ones that determine what meanings and functions are ascribed. Coolen (2005) asserts that studying the meaning of dwellings from this perspective enhances our acquaintance and sheds more light not only what dwelling features people want, but also on why these features are wanted. He further assesses that an individual's collection of meaning structures of dwelling features can be considered as his/hers preferred dwelling-quality profile. So it will be difficult to know what quality of dwelling space an individual needs until his/hers preferences of dwelling features have been extricated.

There is a symbiotic relationship between housing preferences on one hand and meaning of housing and use on the other. Arias (1993, p. 171) gives a graphic relationship concept between the role of preferences in housing meaning and use on one hand, and housing alternatives He positioned preferences in the relationship chain at an intervening level between housing alternatives and housing use and meaning. He argues that the relationships between meaning, use and residential alternatives are defined by housing preferences (Fig. 2). The concept suggests that residential preferences as filtration media give meaning and use of housing alternatives.
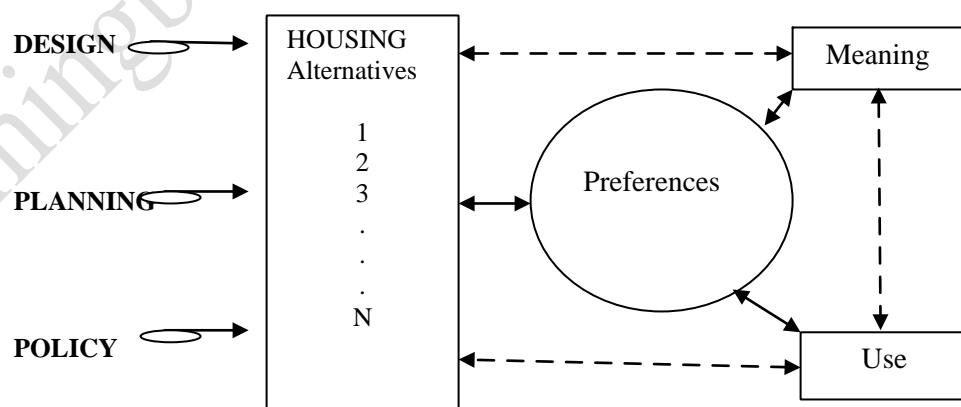

Figure 2: Role of Preference in Housing's meaning and use (Source: Arias, 1993)

The concept depicts that housing alternatives are produced by a combined activities of policy, planning and design, but preferences for these housing alternatives give meaning and use of housing. Arias (1993, p.171) in this respect, defines preference as "a choice of a housing alternative over others in a universe of residential alternatives available to the individual or household". He expanded the meaning of preference to include "rank order, intensity, and the reasons behind the preferences". Housing preferences are seen as either "ideal" (i.e. those not bound by limitations of individual or household, nor by real constraints of the market place) or "revealed" (i.e. those expressed by the consumer through actual housing choice bound by the individual's or household's real constraints). Arias (1993) clarifies that the economic dynamics of households are constraining factors and tend to limit user choice and preference expressions. Dieleman and Mulder (2002, p.34) reveal that the choice of a specific dwelling is inextricably connected with the choice of residential environment.

Lawrence (1993, p.73) drawing insight from different researchers (e.g. Duncan, 1983; Kron, 1983; Altman and Werner, 1985; Lawrence, 1987; Low and Chambers, 1989; Kent, 1990), asserts that the meaning and use of home like that of housing are not only complex and elusive, but they vary from person to person, between social groups in the same society, across culture and during the course of time. In drawing a distinction between "house" and "home", Lawrence (1993) connects them to tenancy status as the defining factor. He states: "the tenure status of housing, with its implications for personal control is the critical variable that defines what makes a house a home. He reveals that home is a complex entity that defines and is defined by cultural, socio-demographic, psychological, political and economic factors. Seegert (1985, p.187) reveals that home connotes a more active and mobile relationship of individuals to the physical, social and psychological spaces around them; and that it points to the way in which our personal and social identities are shaped through the process of dwelling. Serfaty-Garzon (1985) reveals that a dwelling as a place is in three dimensional levels, as:

i) an 'inside' as opposed to an 'outside'; ii)   a place that always 'generates order'; and iii) a place that makes room for being, for dwelling, through the events that constitute the gestures and the human relationships that develop in it.

He submits that the reason why the question of shifting from "space" to "home place" is the question of "making place" and "taking place". This study concerns the "making place" of the dwelling 'inside' as against the 'outside' by the prospective homeowners.

Housing Preference and Choice

Timmermans et al. (1994) and Coolen & Hoekstra (2001), state that the subject of housing selection and housing preference continues to generate a lot of research interest among scholars in various and numerous disciplines. A variety of housing choices according to Beamish et al. (2001), makes housing more than shelter, and the complexity of people's lives makes housing choice a decision that is influenced by a variety of factors. The factors that make housing consumers to transit are general physical characteristics, availability and accessibility of community facilities, characteristics of the inhabitants, and quality of the individual dwelling unit (Wilner et al., 2009, p.199). These factors among others make prospective housing owner prefer one housing unit size to another, one housing unit located in one neighbourhood to another. These factors also would give rise to differences in feelings of allegiance to, and interest in, the neighbourhood, extent of participation in community and neighbourhood activities, and in other indicators of good citizenship.

Preferences and choices are considered as value-oriented and goal-directed actions (Coolen & Hoekstra, 2001; Coolen et al., 2002), as values guide our decisions in life. Coolen et al. (2002), and Coolen (2008, p. 2) defined preference as the "comparative attractiveness of an alternative (object) or attribute rank" while choice is "concerned with actual behaviour". They see intended or actual choices as reflecting the relative strength of behavioural tendencies. Coolen (2008) clarifies further that preferences guide intentions, and choices are expressions of evaluation about an object. He asserts that housing choice and housing preference have been attracting research interests from many disciplines.

Preferences and choices are lifetime phenomena. Every person lives and operates within the framework of choosing from alternatives of life's endeavours in whatever area. Preference is a function of choice (Zinas & Jusan, 2009; 2010a). Molin et al. (1996) put it this way, "choices are assumed to reflect preferences". Zinas and Jusan (2009; 2010a) posit that we live in a world of shifting preferences and choices; and in a society that is in a constant dynamic

operation, based upon the behavioural dynamism of people. They submit that in this cosmic dynamism, preferences and choices keep shifting from one stage to another within the same cosmic space. Coolen and Hoekstra (2001) posit that the choice process is considered to be a dynamic process in which people identify a problem to be solved. Molin et al. (1996) assert that it is only in the process of definite selection that individuals can make known their preferences. Housing preferences and choices like any other life interests therefore operate within this framework.

Housing Attributes and Preference

Although housing brand names are hardly known, however, much is known about the appropriate housing attributes (Coolen & Hoekstra, 2001). Housing preferences and choices operate within the framework of preferences and choices for housing attributes (Zinas, 2012). He further asserts that people do not make choices and preferences for housing brands but housing attributes, which are heterogeneous in nature. Arias (1993, p.172) reveals that preferences for housing alternatives are direct outcomes of the design process such as the floor plan of the unit (e.g. number of rooms and functional arrangement), and non-design outcomes like location and the type of ownership. He elaborates that preference for a housing location alternative can affect the duration of its use by household members (e.g., they can spend more time at home if the house is close to the workplace or schools), as well as the house's image to the user and others alike. The use of house overtime influences household preferences, especially for room sizes, functional arrangements of floor plans, and location of the unit. These factors usually affect previous residential experiences, and can influence future residential choices and preferences. The preference of a unit as a whole could be assessed through an understanding of the consumer preferences for individual elements, which are regarded as attributes (Arias, 1993, p. 189). LefkoffHagius and Mason (1993) see attributes of any product as made up of three divisions as:

i. *Characteristics attributes:* related to the physical properties of a product;
ii. *Beneficial attributes:* refer to benefits or risks that a product may cause;
iii. *Image attributes:* properties of a product that have an ability to define product owner's relation to self or other people.

On the framework of means-end chain (MEC), it can be argued that the "characteristics attributes" of Lefkoff-Hagius and Mason (1993) division is the

"attribute" variable; "beneficial attributes" is the "consequences" of product variable; while 'image attributes' represent the "user value" variable. Arias (1993) classifies attributes in the built environment into "physical" and "non-physical", or with regard to housing as "design-derived" and "non-design derived"; while some researchers (e.g. Rapoport,

2000; Gutman, 1982; Reynolds and Gutman, 1988) classify it into "concrete" and "abstract" attributes.

Housing Preference and Congruence

The New Webster's Dictionary (Lorimer & Lechner, 1995) defines congruence as "an accord" and "a harmonious relation". The concept of person-environment congruence (PEC) is encapsulated in the mutual "fitness", and accord or agreement between the built environment and the user of the environment. It connotes the beneficial relationship that should exist between a person and the built environment. PEC is conceptualized in the effort of man to "domesticate" his environment so as to have maximum satisfaction that engenders maximum PEC, which must operate on the platform of mutual benefits and inter-relationship between him and the 'domesticated' environment. The 'domestication' efforts of the environment begin from an articulate visual thinking process leading to a design (Zinas, 2012). From the stand point of housing, the processes of domesticating the environment is part of homemaking, and the person that has the mastery of the design information that expresses his needs and expectations is the prospective owner and/or user (Zinas & Jusan, 2011). The example of this domestication processes is the modifications and remodelling of one's housing environment in an effort to personalize.

Nehrke et al. (1981) reveal that the PEC model represents an approach to understanding the impact of the environment on the well-being and adjustment of the person which may also provide information for the development of intervention programs at individual, group and/or institutional levels. Zinas and Jusan (2011) state that the impact of the environment on the wellbeing of the person can only be positive when the person using the built environment actively participates in the 'domestication' and evolution processes of his built environment. His involvement and participation can only be possible by allowing him to make his choices and preferences which extricate his personal wishes and expectations in the design processes. They further clarify that a

housing design that evolves through this process will minimize the design failing its use which normally manifests in various forms, ranging from simple renovation to remodelling. They submit that people will normally do these activities to achieve PEC.

Many different and great varieties of methodological approaches to measuring housing choice and preference have been suggested or developed, ranging from simple direct questioning of respondents to sophisticated measurement approaches such as conjoint analysis, which allows researchers to test the assumptions underlying their measurement approaches (Orzechowski, 2004; Timmermans et al., 1994). Conjoint analysis is a measurement approach in which users are requested to express their preference for attribute profiles, which are constructed according to an experimental design (Orzechowski, 2004; Timmermans et al., 1994). Timmermans et al. (1994) methodological works presented broadly two measurement housing choice and preference modelling approaches as:

- ➢ The revealed housing choice models; and
- ➢ The stated housing preference and choice models.

Revealed models are based on observational data of households' actual housing choices in real markets (Orzechowski, 2004; Coolen & Hoekstra, 2001). Often, the aim of studying housing choices and preferences using these models is to identify the nature and strength of the relationship of the probability of choosing a particular housing type and a set of spatial and socio-demographic variables. According to research, these studies are primarily descriptive (Louviere & Timmermans, 1990; Timmermans & van Noortwijk, 1995; Dieleman, 1996; Wang & Li, 2002), which have increased the understanding of housing markets substantially.

Stated models are founded on proposed housing selections or theoretical housing preferences (Coolen & Hoekstra, 2001; Coolen et al., 2002), and on the premise that observed housing choices will always reflect the joint influence of preferences, market conditions, and availability (Orzechowski, 2004; Timmermans et al., 1994). In elucidating this type of housing selection, Clark & Dieleman(1996) argue that research works have shown the influence of macro-level factors (e.g. housing market, housing system, economic situation) and the micro-level factors (age, household composition, income and current housing situation) on housing attributes choice.

Coolen et al. (2002) however see a lacuna with this measurement approach because it did not give attention to motivational micro-level factors such as goals, values and attitudes as it relates to housing choices. This is where MEC model is relevant to measure these intrinsic and abstract variables (Zinas & Jusan, 2010b). Consequent upon this observed lacuna, Coolen et al. (2002) used an extended MEC model in which micro-level motivational factors such as values and goals are related to stated-housing choice for their study to determine proposed residence alternative in the Netherlands. These models are predicated on people's expression of preferences and choices.

CONCEPTUAL FRAMEWORK OF MEANS-END CHAIN [MEC] Model

This section outlines and examines briefly the conceptual frameworks of Means-End Chain (MEC) research model, the supporting concepts of stated housing preference and housing choice models and person-environment congruence (PEC) which is the ultimate purpose for the respondents' choices and preferences of these housing interior finishes attributes.

Means-end theory

The Means-end theory (Gutman, 1982) elucidates the associations between goods and consumers. Reynolds and Gutman (1988) assert that means-end theory denotes the underlying rationale why consequences are important – personal values. People buy features or goods that bring benefits that get them closer to valued end states. According to Coolen et al. (2002), "means" in this context are goods (defined by a collection of attributes) which people consume or used and activities that they engage in. "Ends" are positively (or negatively) evaluated situations. These attributes capitulate effects when the product is used.

The significance of benefits and effects from any goods are based on their ability to satisfy motivating user values and goals of people. Thus, in means-end theory the associations between the attributes and the values are also indirect, but the intervening grouping called consequences is much broader. Coolen and Hoekstra (2001) posit that it may encompass everyday activities; which also are more functional or psychosocial in nature. The means-end approach is also much more bottom-up in the sense that the meaning a good has for an individual is investigated from the point of view of the individual and not the researcher's as attested by Coolen and Hoekstra (2001) that attributes,

consequences and values are determined in the first place by the respondents and not by the researcher. A means-end chain model offers a way for unfolding the choice of a good to its contribution to the realization of objectives and values. The most important linkages between values and objectives on the one hand and behaviour and preferences on the other form the elements of the means-end chain model.

Means-End Chain (MEC) model has been used extensively for research in merchandized products field for many years, but in the past few years it has been gaining its usability interest among housing environment researchers (Tania et al., 2006). Unlike merchandized products brands, housing brands are hardly known, because of the heterogeneous nature of the housing product - the house. However, much is known about the relevant housing attributes (Coolen & Hoekstra, 2001).

The Means-End Chain (MEC) Model

The Means-End Chain (MEC) model (Gutman, 1982) originally developed by Jonathan Gutman for merchandized products, which application in the field of architecture and urban design has been very useful and successful in the past few decades (Tania et al., 2006) is the framework within which this paper is anchored. MEC utilizes the laddering technique for data collection, analysis and interpretation (Mahmud, 2007a; Coolen & Hoekstra, 2001).

MEC model has a long research history with a focus on qualitative in-depth understanding of consumer motives. This qualitative approach was used to identify and represent the content and structures of consumer models for products and brands. Reynolds and Gutman (1988) made MEC model well-accepted by providing a hands-on description of how to conduct, analyze and use MEC interviews (Weijters & Muylle, 2008). Kaciak and Cullen (2006) assert that MEC has been a popular and ever-evolving research domain since its introduction. Gutman's MEC theory (1982) was inspired by research from Rokeach (1968), and Yankelovich (1981) who showed that values direct people's behaviour in all aspects of their lives (Boer & McCarthy, 2004). Although MEC original purpose was for linking consumers' values to their choice behaviour in marketing and consumer research, it is becoming popular in other areas (Tania et al., 2006) like architecture, urban design, advertising, information technology, and organizational management (Rugg et al., 2002). Gutman (1982) defines MEC as a model that seeks to clarify how products or service selection facilitate the attainment of required end states. MEC connects serially products' attributes (A) to consequences of product use (C) and to individuals' personal values (V). The resultant A-C-V sequence that forms is

called means-end chain or ladder. Coolen et al. (2002) view MEC as a model that relates the choice of a good (defined as a collection of attributes) to its contribution to achieving objectives and values. They explained that "means" are objects (products) or activities in which people engage e.g. sleeping, socializing, cooking, etc, and "end" is valued states of being such as pleasure, safety measures, and successes. The essential idea in MEC theory is that clients determine the behaviours which generate the desired benefits and which minimize the undesirable effects. Reynolds and Whitlark (1995) paradoxically stress that while a means can be an end, an end can also be a means. Meesters (2005) posits that in order to make the right choice between the different goods with different consequences, the user must learn which products hold the attributes producing the advantageous consequence.

In the means-end chain model, products are thus not selected and acquired for themselves or their quality, but rather for the meaning they provoke in the mind of prospects (Reynolds and Gutman, 1988). In this way products, though selected for fairly concrete features, such as their characteristics and attributes (e.g. proportion of fat, colour, origin, production method), and for the benefits which they are capable of providing – functional or psychosocial consequences (e.g. a healthy and tasty diet) - are in fact perceived subconsciously as aimed at and connected with the achievement of individual goals (Pieters et al., 1991)

Structure of MEC model

The variables or constructs of the original structure of MEC model (Gutman, 1982) are attributes (A), consequences (C) and values (V) (Fig. y). The connection between values and consequences is of critical import in the MEC model. Coolen et al. (2002) give the linkages as, firstly, that a certain product must be consumed or used to realize its attractive effect; secondly, it is the linkage between effects of a product and its attributes.
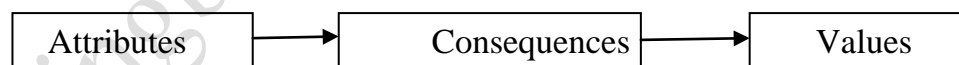
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┌─────────────┐      ┌─────────────────┐      ┌───────────┐
│  Attributes │ ───► │  Consequences   │ ───► │  Values   │
└─────────────┘      └─────────────────┘      └───────────┘
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Figure 3: Structure of MEC (Source: Gutman, 1982)

It explores the relationship between user and product through the construction of a simple associative network between concrete and abstract product attributes, functional and psychosocial consequences linked with product use and, finally, consumers' instrumental and terminal values. Product attributes are but means through which consumers achieve their ultimate values, ends, via the positive consequences or benefits accruing from the attributes. In other words,

goods/services are seen as means to satisfy needs that are conscious to a varying degree.

The conceptual model of MEC theory can be abridged in the following suggestions (Pieters et al., 1991): firstly, that the subjective familiarity about consumers' goods and services is ordered in associative set of connections; secondly, that the ideas in these set of connections that are pertinent for consumer decision-making are characteristics of products, benefits from these products after use, and consumers' values; thirdly, that characteristics of products, benefits from these products and values are ordered hierarchically; and fourthly, that the cognitive structures of consumers about products and services determine appropriate consumer behavioural actions (Pieters et al., 1991; Coolen & Hoekstra, 2001).

Olson and Reynolds (1983) proposed some alterations on Gutman (1982) model bringing an enlargement on the chain levels. The broadened model recommends that the attributes be sub-divided into concrete and abstract; consequences into functional and psychological; and personal values into instrumental and terminal (Botschen et al., 1999; Valette-Florence & Rapacchi, 1991). The broadened conceptual framework of MEC model is as illustrated in Figure 4.
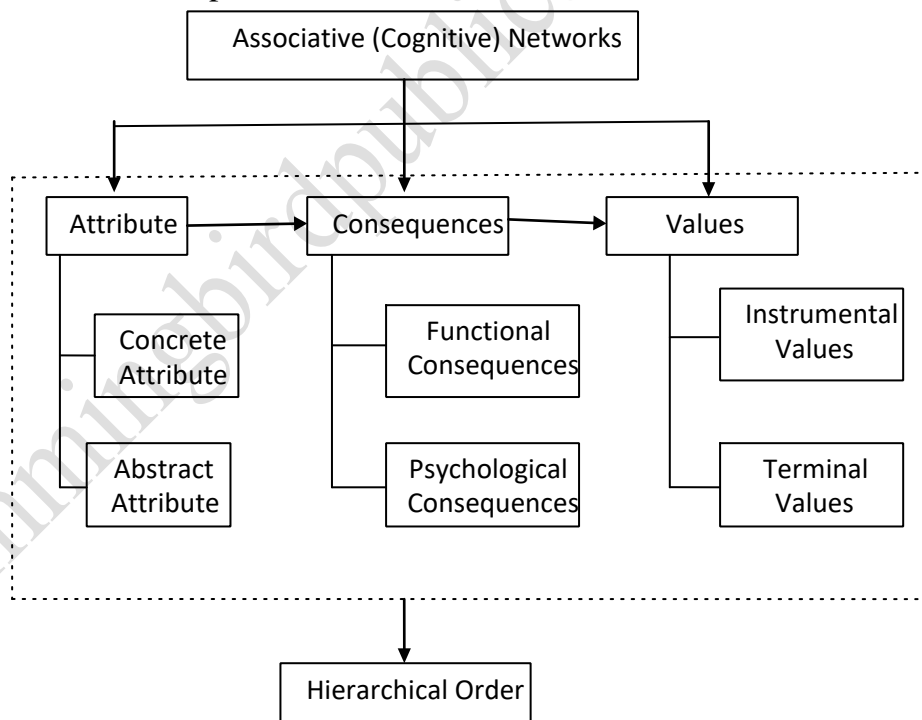

Figure 4: Broadened Structure of MEC Model (Olson & Reynolds, 1983; Gutman, 1982) Adapted from Zinas &Jusan (2010a)

Attributes

Attributes are concrete (e.g. colour) or abstract (e.g. taste) product characteristics. The New Webster's dictionary defines attributes as "a quality proper to a characteristic of a person or thing." Valette-Florence and Rapacchi (1991) view attributes as features or aspects of products or services. Gengler et al. (1999) perceive them as rather conveying concrete meanings that stand for physical or perceptible features in a product. According to Botschen et al. (1999), attributes are features of products, services, or behaviour that are preferred or sought for by consumers. Morris and Winter (1978 p. 126) in explaining the distinction between attributes and characteristics state that attributes are the objective properties possessed by or inherent in an object, while characteristics are the objectively measurable subset of the total set of attributes. While agreeing to all these definitive views, attributes can be seen as the intrinsic and physical features, properties or characteristics that define a product or person.

Attributes are of two levels: concrete attributes and abstract attributes (Olson & Reynolds, 1983). Abstract attributes are defined as the directly perceptible physical characteristics of a product, e.g. price, color, and weight (Vriens & Hofstede, 2000), relatively intangible characteristics, such as style and brand (Lin, 2002), or perceived value or importance (Botschen et al., 1999). Mahmud (2007b) classifies concrete attributes into two groups, namely, element and relationship, as it relates to housing.

Consequences

Consequences are defined as "that which follows something and arises from it" (Lorimer & Lechner, 1995). They are the effects that are produced by a given product. Lin (2002) posits that effects of products are what the user feels after using the product, this might be a affirmative reaction e.g. benefits, or a negative feeling, e.g. perceived risks. They are at the intermediary level in the chain, and have a more abstract meaning that reflects perceived benefits (Gengler et al., 1999).

Jusan (2007a) relying on Gutman (1982) states that there are two categories of consequences in Gutman's MEC, namely, functional consequences and abstract consequences. He posits that functional consequences refer to practical benefits and performance outputs, while abstract consequences are feelings or social considerations. Consequences may be physiological (satisfying hunger, thirst,

or other physiological needs) or psychological (self-esteem, improve outlook in the future) or sociological (enhance status, group membership) in nature. They may occur directly (e.g. buying a new dress, I feel better) or indirectly (e.g., because I feel better, people react more favourable to me) (Gutman, 1982).

Personal Values

Values are at the most abstract level in the chain. They are the benefits and relatively stable conditions that have a strong emotional impact e.g. security, happiness, fun, and enjoyment (Vriens & Hofstede, 2000). Values are life's drivers that cause an individual to function in all his actions. They are propellers for preferences and choices in life. They are the reasons for the affection a person has for whatever he has affection for. They coordinate most of a person's behavioural traits in life. They are the things that direct and shape our inner motivations and choices in life.

Schwartz (1994) assesses that values can influence behaviour in the following ways: firstly, values contribute to our ability to take a standpoint with respect to political and social questions; secondly, values may be used in the assessment of ourselves and others; thirdly, values play a central part in comparison processes; and fourthly, values may form criteria for all the evaluation of the opinions, attitudes and actions of ourselves and others (Coolen & Hoekstra, 2001). In order to be able to live and function in a social environment, individuals and groups transform the needs that is inherent to human existence into specific values (Coolen et al., 2002; Coolen & Hoekstra, 2001). Schwartz (1992) states that the central role of values in the human cognitive system stems from three types of human need: the needs of the individual as a biological system; the demands set by coordinated social interaction; and the demands which stem from the functioning and survival groups. From these fundamental human needs, Schwartz (1992, 1994) empirically derives ten universal, motivational value domains. These domains are:

1. Power (social power, wealth);
2. Achievement (success, ambition);
3. Hedonism (pleasure, enjoying life);
4. Stimulation (daring, exciting life);
5. Self-direction (independence, curiosity);
6. Universalism (social justice, unity with nature);
7. Benevolence (helping, true friendship);

8. Tradition (modesty, devoutness);
9. Conformity (politeness, self-discipline);
10. Security (family security, cleanness)

(Jusan, 2007a; Coolen et al., 2002; Coolen & Hoekstra, 2001).

In a choice situation, various values will be activated in a person's value system. It is unlikely that people will be able to act in agreement with all of the activated values simultaneously (Rokeach, 1973). Blaauboer and Mulder (2007) contrast the choice behaviours of two individuals with similar backgrounds by adjudging that two individuals in the same phase of their life course (of the same age or both at the end of their educational career) can make different choices on family formation, because they have different preferences or attitudes. On the whole, it can be concluded that values define a person in the totality of his behaviour, attitude, goal direction and general orientation of life. Any choice therefore that an individual makes, is navigated and oscillated within the pendulum of life's values (Zinas &Jusan, 2010a).

Means-End Chain and Housing Choice and Preference
Housing is a complex and heterogeneous product in its setting; the cognitive structures of housing users for housing attributes is also complex as well as their choice behaviours. Choices are versions of our life expressions. We become versions of who we are based on the different choices that we make (Zinas and Jusan, 2010a). They further posit that preferences and choices are lifetime phenomena, and that every person lives and operates within the framework of choosing from alternatives of life's endeavours. These choice and preference activities are dynamic in modus operandi. Molin et al. (1996) state that choices are understood to echo preferences. The Means-End Chain (MEC) model has been found in its application to successfully handle and measure these complexities in housing research. Even though housing brands are hardly known, however, the housing attributes are well known (Coolen & Hoekstra, 2001), however to measure housing choice and preference behaviours using the MEC model some measurement elements or approaches can be suggested to handle the quantitative aspect that the laddering interviewing technique that MEC models utilizes for data gathering is unable to do. This serves as an extension to MEC model (Zinas & Jusan, 2010b).

METHODOLOGY OF MEC RESEARCH CONCEPT

The conceptual steps outlined by several researchers (Jusan, 2007a; Tania et al., 2006; Costa et al., 2004; Coolen & Hoekstra, 2001; Gengler & Reynolds, 1995; Reynolds & Gutman, 1988) for eliciting relevant attributes in MEC for laddering interview seem to have elements for both quantitative and qualitative research methods with respect to measuring housing choice behaviours particularly in hypothetical situations. In a situation where the relevant attributes are known like it is for housing, the first two steps in MEC should not be used as posited by Coolen and Hoekstra (2001). According to them, this method is often used where relevant attributes are unknown, and one is dealing with a homogeneous product field. They further stressed that housing is an extremely heterogeneous product which brands are hardly known, even though its relevant attributes are known. In their research, they employed the Repertory Grid as a tool with which they compiled and presented to their respondents 45 housing attributes for them to select or choose from the list the attributes they preferred, thereafter, the laddering interview was conducted.

In a hypothetical or intended housing choice and preference research situation, some other instruments like questionnaire can be employed to elicit the respondents' attributes choice and preference before the laddering interview in MEC can be conducted. The conceptual framework of stated housing preference and choice modelling approach presents a potential for this to be achieved. Stated models are choice-based approaches and method of preference elicitation that presents to respondents one or more choice sets of two or more alternatives and asks that they indicate their most preferred alternative. (Adamowicz et al., 1998).

According to Orzechowski (2004), the alternatives of interest can be presented through a questionnaire by paper-and-pencil, but other means of presentation such as multi-media can also be used. He clarifies further that the major advantage of this model is that it allows you to measure preference of choice behaviour for products that do not exist yet (Orzechowski, 2004). Abley (1997) asserts that the data generated from this kind of survey proved far easier to analyze, and allowed greater prediction of market shares. Merino-Castello (2003) outlines two techniques for these approaches as:

> ➢ Consumers are asked to evaluate a series of hypothetical and real products, defined in terms of their features; and

> ➢ Consumers are asked to view a series of competing products and select one or, in some cases, more than one.

He posits that these choice-based approaches are based on a more realistic task that consumers perform every day; the task of choosing a product from among a group of competitors. Harmonizing these positions therefore, a proposed extension to MEC model for housing choice and preference in a hypothetical research setting is made as in figure 5. The research is to be conducted within the framework of this extended MEC model.
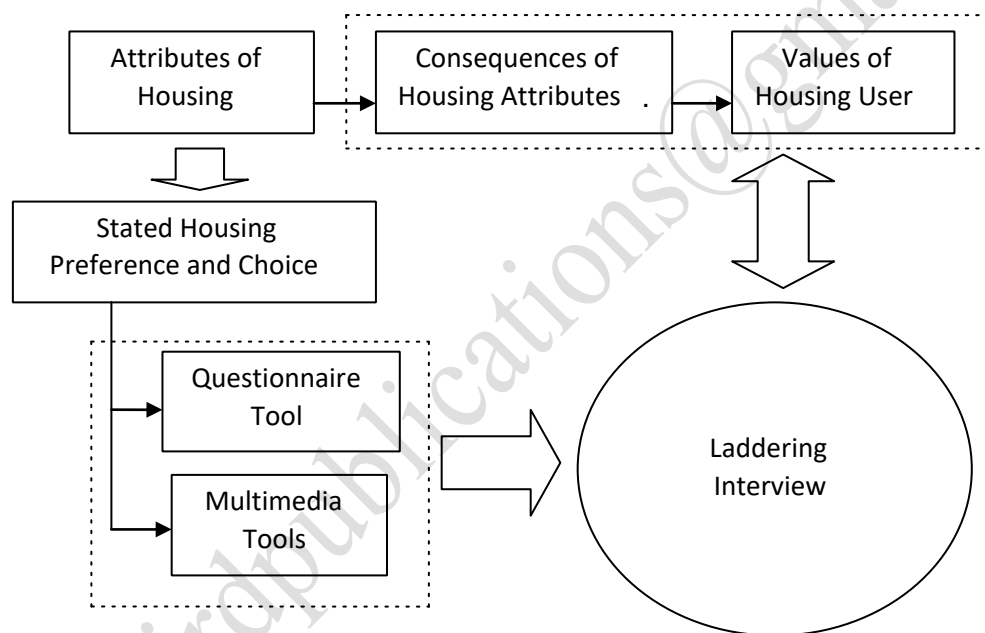

Figure 5: Extension to MEC model for Housing Choice and Preference
(Source: Zinas and Jusan, 2010b; 2011; Zinas, 2012)

This extended MEC model proposes that a set of housing attributes are profiled in a questionnaire or multi-media tool(s) and presented to target respondents to elicit their choices through a selection process. Thereafter, this choice information are fed into the laddering tool for the laddering one-on-one interviews to elicit the linkages of consequences of the chosen housing attributes, and the personal values that necessitated these choices. The research relationship between laddering interview and the variables of consequences and user values in the model is a kind of 'pendulum-swing' type as outlined in the

traditional MEC model. The sampling processes of the respondents in both stages depends largely on the researcher's investigative interest, which he must establish within a certain sampling criteria determined by him.

CONCLUSION

In conclusion, although the applications of the MEC model in housing research and its attendant linkages is still at its relatively infant stage, it is found from the few studies conducted, that using the MEC model as a tool has been very positive in performance – and proved that MEC can be relied upon for housing research. This then presupposes that a lot and vigorous housing research needs to be carried out with MEC model.

Laddering, which is unquestionably a useful technique for identifying the relevant attributes and life values in a particular product domain, and for studying the complexities of consumers' cognitive structures with respect to that domain, can fruitfully be combined with a questionnaire technique in eliciting responses from housing users to establish their choice behaviours. It could also be used with any of the other models highlighted herein. In this respect, a proposed extension to the traditional MEC model for hypothetical housing research is presented as a model that should be used for environment based research.

The few researches conducted have been done mostly in the area of spatial configuration of the housing product – the house. The house which is made of diverse and heterogeneous attributes requires that other aspects of the housing attributes need to be researched into, and the attendant motivations for the housing user in choosing a set of housing attributes over and above alternative sets of housing attributes. Besides the spatial configuration attributes (e.g. the size or number of rooms) of the house, there are other attributes of the house like concealed attributes (e.g. reinforcements, substructure, beams, columns, etc.), exposed attributes (e.g. fittings, finishes, etc.), elemental components (e.g. windows, doors, etc), roof style (e.g. gabled, hipped, flat, etc), and aesthetics attributes (e.g. the treatment of the external features of the building), that require further research. Spatial dimensional attributes (e.g. the sizes of the rooms, both horizontal and vertical) of housing is also another area that requires further research. For each of these attributes, there are motivational reasons for the preference and choice behaviour of the user in deciding for each set of preferred attributes alternatives as illustrated in the conceptual frame in Figure 6 below.
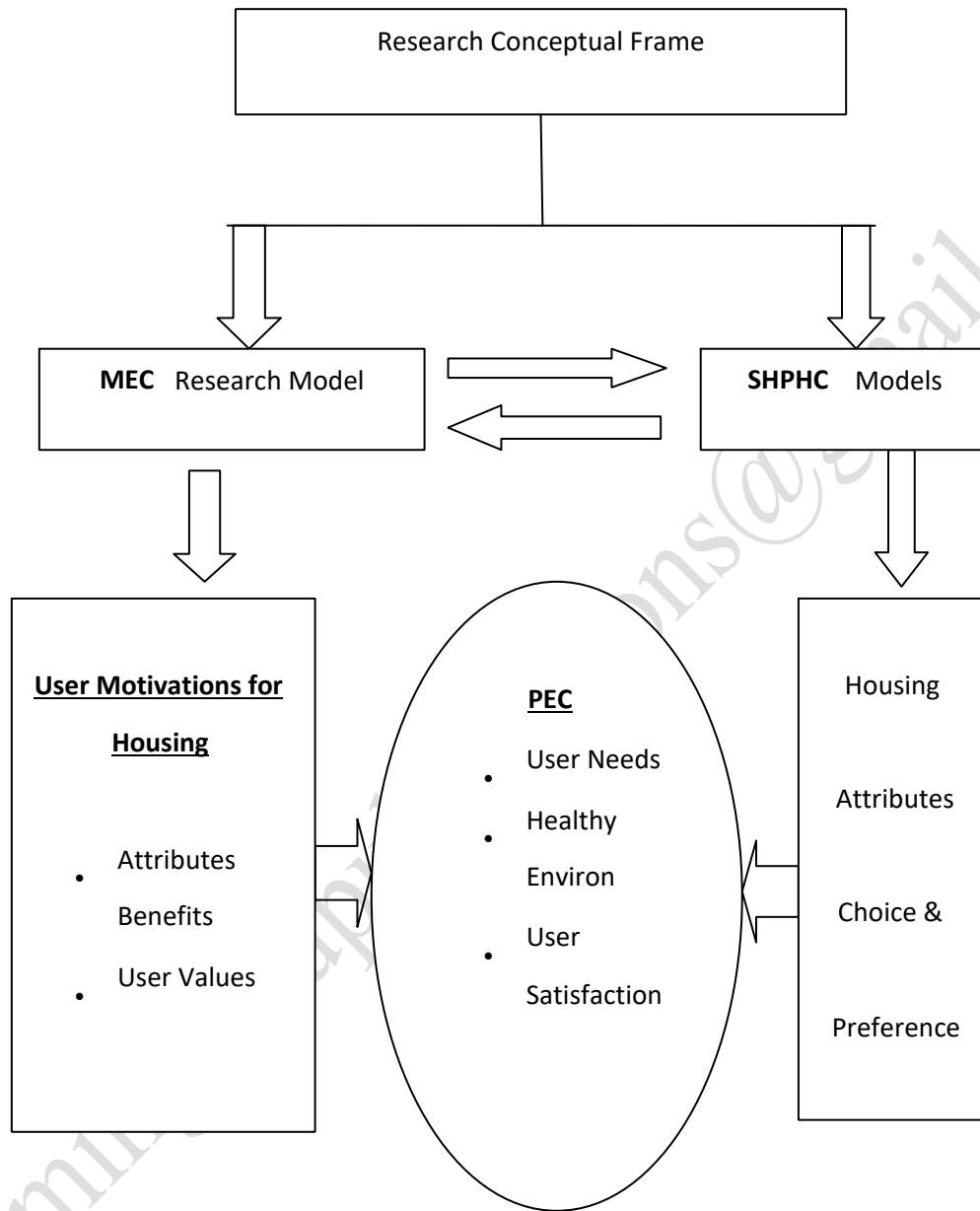
Figure 6: Conceptual Framework of the Research

The study is to be conceptualized within frameworks of MEC, SHPHC and PEC; although PEC is not being measured, but the measurements by MEC and SHPHC are meant to achieve PEC as the end product of the housing environment. This is aimed at guaranteeing a housing environment that satisfies the needs of the user.
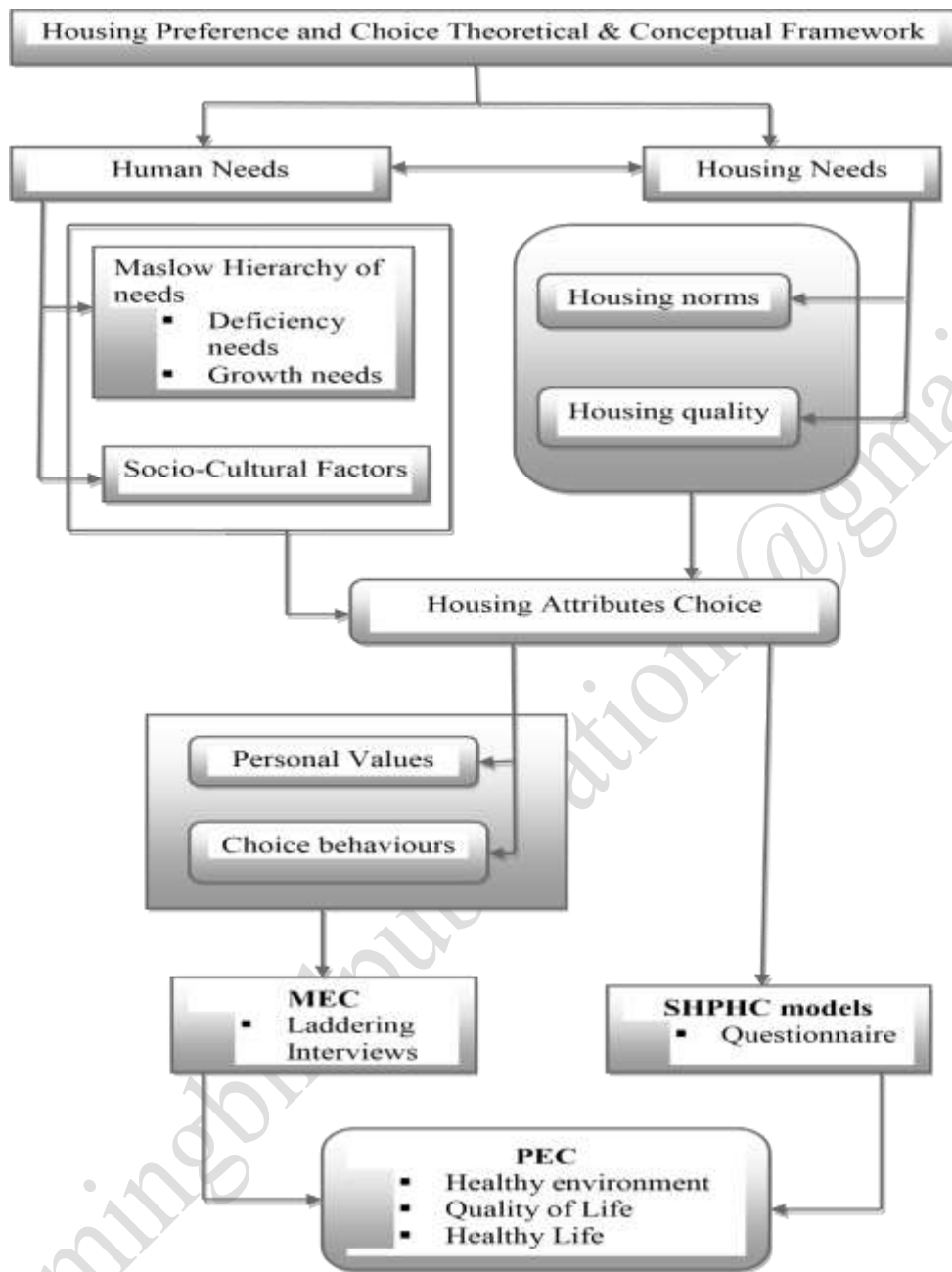
Figure 7: Theoretical and Conceptual Framework of the Research

Figure 7 summarises the framework within which the research is expected to be based. Housing interior finishes attributes choice and preference is to be investigated within the context of human needs as profile by Abraham Maslow and socio-cultural factors of the housing owner, and the housing needs. Housing

needs and human needs are interacting upon one another in terms of influence. Housing needs influence human needs and vice versa. Housing needs are investigated within the framework of housing norms and housing quality, which is determined by housing attributes choice and preference actions, which are made to achieve personal values and choice behaviours. These two constructs (values and choice behaviours) are measured by MEC through laddering interviews, whereas housing choice processes are measured by SHPHC models through a structured questionnaire. These measurement actions are to determine a housing environment that is healthy, achieve quality life, which will engender healthy life; and an environment that will be congruent with the housing user.

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