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Housing Interior Floor Finishes Choice and Preference and Motivations for Achievement of Person-Environment Congruence

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ABSTRACT

Aesthetically pleasant housing environment product can be depicted in the way and how it is finished; which also gives it its meaning and identity. This paper presents part of the findings of housing interior finishes choice and preference among prospective house owners in Yola, Nigeria. The study was conducted within the theoretical and conceptual frameworks of means-end chain (MEC) research model, stated housing choice and preference methods and person-environment congruence (PEC). Eighteen (18) sets of finishes segmented under floor, walls and ceiling were presented in a matrix format in a questionnaire to one hundred and fifty randomly sampled respondents to elicit their choices for finishing their would-be housing spaces. Thereafter, a semi-structured interviewing technique called Laddering was conducted with fifteen (15) of the respondents that participated in the survey to elicit and disentangle the motivational reasons underlying their choices and preferences. The voice-recorded interviews responses were transcribed; thereafter the textual data were content analyzed. The results showed that prospective house owners in Nigeria prefer ceramic tiles to finish their floors because of ease of cleaning which engenders a hygienically clean housing environment that eliminates diseases prone housing environment, which translates to healthy family. The study also found that the multiplier effect of this type of environment is that finances are saved to attend to other competing needs. This is significant for Architects and housing provision practitioners to propose housing interior finishes materials for floors that are easy to clean which promotes cleanliness.

Keywords: housing interior finishes; means-end chain; housing preference and choice; laddering; stated housing preference and choice; person-environment congruence;

1. INTRODUCTION

Housing product is made of heterogeneous attributes, although it is not a branded product. The quality of housing and housing space impacts on the quality of life and wellbeing of the housing user. Bluyssen (2009 p.4) posits that 'unhealthy indoor environment' could result to diseases and disorders to the human body. Housing and housing space has been a place for personal development, recreation and self accentuation. The need for housing and housing space quality can therefore not be overemphasized.

The housing space quality defined as "fitness for use" (Ozsoy & Gokmen, 2005, p.19) is achievable largely by involving the would-be user of the space through the articulation and incorporation of the user's design needs and expectations. According to Smith, et al., (1997; as reported in Ozsoy & Gokmen, 2005, p. 18), the concept of quality has a very broad usage, encompassing a variety of meanings. They defined quality as "distinguishing properties that promote a degree of excellence". These 'distinguishing properties' can be determined only by eliciting from the would-be users of the housing their choices of the kind and quality of housing space they prefer; and to disentangle their motivations for such preferences. Achieving quality housing space will invariably engender the achievement of person-environment congruence (PEC).

This paper presents part of the findings for housing interior finish choice and preference among prospective house owners in Yola-Nigeria. The research was conducted within the methodological and conceptual frameworks of means-end chain (MEC) model (Gutman, 1982), and the housing preference and choice models (Timmermans, 1994). MEC has been found to be very valid, reliable and potent in performance for measuring both objective and subjective aspects of housing environments and users intrinsic choice behaviors respectively.

2. THEORETICAL FRAMEWORK

This section highlights the theory of MEC, Stated Housing choice and preference, and PEC, upon which the study is based.

2.1 The Means-End Chain (MEC) Model

MEC model has a long research history. Gutman (1982) first introduced the concept, 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 (Christensen & Olson, 2002). 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 behavior in all aspects of their lives (Boer & McCarthy, 2004). Although MEC original purpose was for linking consumers' values to their choice behavior 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 explain how a product or service selection facilitates the achievement of desired end states. MEC links sequentially 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. running, reading, cooking, etc, and "end" is valued states of being such as happiness, security, and accomplishment. The essential idea in MEC theory is that consumers choose the actions which produce the desired consequences and which minimize the undesirable consequences. 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 consumer must learn which good possess the attributes producing the desirable consequence.

2.1.1 Conceptual structure of MEC model

The variables or constructs of the original structure of MEC model (Gutman, 1982) are attributes, consequences and values (Fig. 1). The linkage between values and consequences is of essential importance in the MEC model. Coolen et al. (2002) give the linkages as, firstly, that a certain good must be consumed or used to realize a desirable consequence; secondly, it is the linkage between consequences and the attributes of goods.

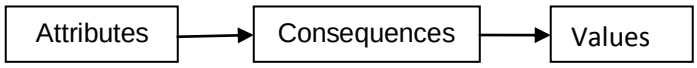

Figure 1: Structure of MEC (Source: Gutman, 1982)

The conceptual model of MEC theory can be summarized in the following propositions (Pieters et al., 1991): firstly, that the subjective knowledge about consumers' goods and services is organized in associative networks; secondly, that the concepts in these networks that are relevant for consumer decision-making are attributes of products, consequences of product use, and consumers' values; thirdly, that attributes, consequences and values are ordered hierarchically; and fourthly, that the structure of consumers' knowledge about goods and services influences relevant consumer behavior (Pieters et al., 1991; Coolen & Hoekstra, 2001). Olson and Reynolds (1983) proposed some modifications on Gutman (1982) model, broadening 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).

2.1.2 Assumptions of MEC

The original MEC model by Gutman (1982) is based on four assumptions. First, it assumes that objectives and values influence choice processes; secondly, it assumes that people can keep track of the enormous diversity of goods by grouping them in sets or classes so as to produce the complexities of choice; thirdly, it assumes that behavior of consumers has consequences, although these consequences do not have to be for everybody; and fourthly, it assumes that consumers learn to associate particular consequences with particular behaviors (Gutman, 1982; Coolen & Hoekstra, 2001; Tania et al., 2006).

2.2 Laddering Technique

The method used for data collection in MEC is known as laddering. It was first introduced in the 1960s by clinical psychologists as a method of understanding people's core values and beliefs (Hawlev, 2009). Various researchers, (Tania et al., 2006; Costa et al,. 2004; Grunnet and Grunnet, 1995; and Reynolds and Gutman, 1988) agree that the laddering technique was developed by Dennis Hinkle in 1965 (PhD dissertation), as a means of modeling people's belief structures; and the term "laddering" was coined by Bannister and Mair (1968) who extensively used the technique in their research.

Laddering refers to an in-depth one-on-one interviewing technique used to develop an understanding of how consumers translate the attributes into meaningful associations with respect to self, following means-end theory (Gutman, 1982; Reynolds & Gutman, 1988). Reynolds and Whitlark (1995) describe it as an interviewing technique that can be used to elicit means-end connections and attribute-consequence-value networks people use when making decisions about life's endeavors. It is qualitative in nature – utilizing a semi-structured

interviewing tool aimed at eliciting responses from respondents' perception on the attribute-consequence-value (A-C-V) elements (Jusan, 2007). Reynolds and Gutman (1988) assess that laddering involves a tailored interviewing format using primarily a series of directed probes, typified by the "why is that important to you?" question, with the express goal of determining sets of linkages between the key perceptual elements across the range of attributes (A), consequences (C), and values (V). Costa et al., (2004) describe it as face-to-face, individual, in-depth, semi-structured interviews aiming at the elicitation of the attribute-consequence-value associations consumers hold regarding the object(s) under study.

2.2.1 Conceptual Framework of Laddering Technique

Laddering technique is generally framed in seven phases for the purpose of data collection, analysis and interpretation. The following phases have been outlined: 1) elicitation of the attributes; 2) selection of the functional attributes; 3) elicitation of the attribute levels; 4) performing laddering interviews; 5) determination and coding of means-end chains; 6) aggregation: construction of hierarchical value map (HVM); and 7) analysis and interpretation of the HVM (Jusan, 2007; Coolen & Hoekstra, 2001). These phases are for the purpose of measuring and analyzing the various elements and the linkages between them in MEC.

Gengler and Reynolds (1995) sum the steps for the laddering analysis and interpretation as follows: 1) data reduction (data conversion into separated phases); 2) content analysis of the elements selected in the previous steps; 3) summation of relations in content codes, resulting in an implication matrix of all paired relationships; and 4) construction of a diagram to meaningfully represent the main implication of the study – the HVM. Several researchers (Jusan, 2010b; Tania et al., 2006; Costa et al., 2004; Coolen & Hoekstra, 2001; Gengler & Reynolds, 1995; Reynolds & Gutman, 1988) are unanimous that content analysis tool is the core of the analytical procedure in a means-end study (Zinas & Jusan, 2010a, b).

Tânia et al. (2006) outline the following concept for analyzing data that originated from the laddering interviews: the first step is the reduction of data originated from interviews. These phrases are basic elements in which the subsequent analyses are based. To identify the elements that better represent the expressed concepts by each person individually. The results are categorized under codes. Each code is identified as an attribute, consequence, or value, which means that all data are categorized into elements. There is a common coding for all products involved into the laddering interviews.

Following the coding step, an implication matrix is generated which serves as a method of bridging the gap between the qualitative and quantitative aspects of the technique. A HVM is then constructed on the basis of the results of the implication matrix. It shows a graphic presentation of all the most frequently mentioned attributes, consequences, and values, and it consists of a series of nodes, connected by lines, representing the aggregate of the respondents' ladders. The laddering results can be used to create an HVM summarizing all interviews across individuals, which is interpreted as representing dominant perceptual orientations, or "ways of thinking" with respect to the product category (Tania et al., 2006; Devlin & Birtwistle, 2003;. Lin & Fu, 2001). (For details of examples of coding, Implication Matrix and HVM, refer Tania et al., 2006)

2.3 Housing Preference and Choice

Housing choice and preference has been extensively studied (Mulder, 1996), but not within the context of behavioral framework of MEC. Most housing choice studies have been conducted within the framework of stated housing preference and choice model, but neglecting the intrinsic choice behaviors that informed such choice actions (Zinas & Jusan, 2010a, b). Coolen et al., (2002) averred that researches in housing preferences paid little attention to underlying motivational factors as goals, attitudes and values. Zinas and Jusan (2010a, b) submit that this is where MEC model is relevant to measure these intrinsic and abstract variables. Molin et al. (1996) argue that stated preference and choice models are potentially powerful in eliciting consumer housing preferences

2.4 MEC and Housing Choice & 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 behaviors. Choices are versions of our life expressions. We become versions of who we are based on the different choices that we make (Zinas & Jusan, 2010a). They further emphasize that preferences and choices are lifetime phenomena, and that every person lives and operates within the framework of choosing from alternatives of life's endeavors. 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 (Zinas & Jusan, 2010a, b). Even though housing brands are hardly known, however, the housing attributes are well known (Coolen & Hoekstra, 2001), however to measure housing choice and preference behaviors 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 will also serve as an extension to MEC model (Zinas & Jusan, 2010a, b).

The conceptual steps outlined by several researchers (Jusan, 2007, 2010b; 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 behaviors particularly in hypothetical situations. In a situation where the relevant attributes are known like it is for housing, the first two steps should not be used as posited by Coolen and Hoekstra (2001). According to Coolen and Hoekstra (2001), this method is often used where relevant attributes are unknown, and one is dealing with a homogeneous product field.

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 preference and choice model 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, 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 behavior 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, firstly that consumers are asked to evaluate a series of hypothetical and real products, defined in terms of their features; and secondly that 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 as in figure 2

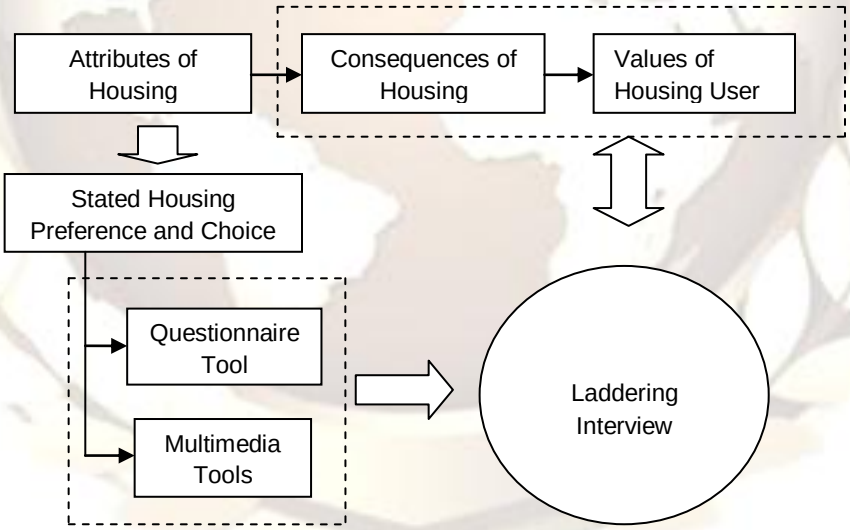

Figure 2: Proposed extension to MEC model for housing choice and preference (Adapted from Zinas & Jusan, 2010b)

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 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.

2.5 Person-Environment Congruence

The New Webster's Dictionary (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. 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.

The home is probably the most important object of the outside world to a person. Martsin and Niit (2005 p.152) declare that the relationship between the person and the home are described by special cognitive, emotional and behavioral ties. They further assert that this makes it possible for the home to be the regulatory means of the openness or closeness of the person to the outside world. These efforts of achieving a healthy living environment is what Jusan (2007, 2010a, b) describes as personalization of housing environment. He posits that in order to cope with conflicting environment situation, two approaches can be adopted by user to achieve PEC. Firstly, the user adapts to the situation and remains in stresses, or secondly, he modifies in order to personalize. Martsin and Niit (2005 p.151) posit that through personalization of the environment, people take control over the external world. To reduce the risks of housing designs failing the test of use, it is of utmost importance to consider and incorporate user needs, wishes, and expectations that will maximize the achievement of person-environment congruence (PEC).

Nehrke et al. (1981) posit 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. In our opinion, the impact of the environment on the well-being of the person can only be positive when the person using the built environment activity 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 design processes. 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 remodeling. People will normally do these activities to achieve PEC.

3. METHODOLOGY

3.1 Elicitation of Housing Attributes

Eighteen sets of interior finishes attributes were compiled and profiled under three attributes segments of floor, walls and ceiling, in a matrix of a structured questionnaire and distributed to one hundred and fifty randomly sampled prospective house owners in the city of Yola, Nigeria. This is consistent with the Coolen and Hoekstra (2001) modified method of MEC for eliciting relevant housing attributes from their respondents. The slight difference is that Coolen and Hoekstra (2001) used a Repertory or Kelly Grid to present the compiled housing attributes to the respondents as against the questionnaire tool we used. Respondents were requested select by indicating their choices and preferences of interior finishes for their would-be housing interior spaces. To make informed responses, a supporting demonstration 3D technical model of a one bedroom bungalow house was shown to each of the respondents that are not technically inclined to clarify the technical terms of the interior finishes elements. The questionnaire also contain some other components as socio-demographic information, desire to build own housing, development stage of proposed housing, and availability to oblige an interview. The questionnaires were collated, and a semi-structured interview called laddering was conducted.

The laddering interview was conducted with fifteen of the respondents that participated in the questionnaires survey earlier, through purposive sampling method. The selection criteria for the fifteen respondents were on four levels: firstly, desire of respondent to build own housing; secondly, development stage of proposed housing below occupational stage; thirdly, frequency of preferred sets of interior housing finishes; and fourthly, willingness to oblige an interview.

The laddering interview with each of the respondents was conducted either in the respondent's house or office depending on respondent's convenient venue and time. Each of the interviews was digitally electronically voice recorded. The average recorded length of time of the interviews was one hour. These free voice recorded interviews responses were transcribed and content analyzed.

3.2 Data Analysis

The finishes choice and preference survey data were analyzed by SPSS tool while Content analysis was used as the method for analyzing the data generated from the laddering interview. . To be able to disentangle the motivations for choice and preference behaviours, only the choice for ceramic tiles as floor finishes material was considered. This is owing to the fact it had significant mention, besides the fact that only the respondents that preferred this material were available for the laddering interview

Table 1: Interior Floor Finishes Choice and Preference (Source: Zinas 2012)

Interior Floor Finishes	Housing Spaces preference Frequencies (%)							Cum. Prefers. (%)
	Corridor/ Walkways (%)	Sitting room (%)	Dining room (%)	Bed room (%)	Kitchen (%)	Toilet (%)	Store (%)	
Ceramic Tiles	66.7	75.3	76.7	70.7	90.0	88.0	38.0	**72.2**
PVC Tiles	8.7	1.3	0.7	0.7	0.7	9.3	8.0	**4.2**
Plywood	0.0	0.0	0.7	0.0	0.7	0.7	2.0	**0.6**
Cement Sand Screed	0.7	0.7	0.0	13.3	2.0	0.7	40.0	**8.2**
Terrazzo	8.7	0.0	0.0	2.7	4.7	0.0	12.0	**4.0**
Stone	0.0	0.0	0.7	0.0	0.7	0.0	0.0	**0.2**
Marble	15.3	22.7	21.3	12.7	1.3	1.3	0.0	**10.6**
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	**100.0**

The transcribed data for each respondent were categorized into three by identifying the basic elements of housing attributes, consequences, and user values, from the texts in line with the traditional MEC theory. For the purpose of this paper, the abstract elements for the concrete attribute "ceramic tiles" were extracted from the bulk of the transcribed data and coded. The coding of the elements was into six content codes. The summary of the content codes are presented in Table 2

.

Table2: Abstract Attributes Linked to Ceramic Tiles Floor Finish (Source: Zinas 2012)

Code	Floor Finishes Abstract Attributes	Frequency of mention (elements)
B	Beauty	34
HG	Hygienic	30
D	Durable	07
AF	Affordable	11
EF	Environmental Friendly	12
AV	Available	12
TOTAL		**106**

4. RESULTS AND DISCUSION:

These MEC results show that ceramic tiles floor finishes were preferred; and the emphasized abstract attributes linked with this floor finish are beauty, hygienic, durability, affordability, environmental friendly, and availability; with a cumulative mentioned elements of 106 (Table 2).

These abstract attributes in table 2 are the categorized attributes of several attributes elements associated and categorized under them. The attribute, "beauty" (34) was associated with the attribute elements such as "beautiful", "appealing" and "attractive". Attributes elements mentioned linking "hygienic" (30) characteristic of ceramic tiles are "easy to clean/maintain", "easy to clean and wax", "easy to maintain", "it is clear", "free of dust", "does not hide dust", and "hygienic". "Durable" (7) elements linked to ceramic tiles floor attribute are "can last long", "it lasts long", and "its durability". "Affordable" (11) attribute was linked to the following attribute elements: "it's affordable", "it is cost effective", "it is moderate cost wise", and "they are cheap". "Environmental Friendly" (12) attribute category was linked by attributes elements of "poor conductor of heat", "it's cool and soft", and "has harmony with the environment". "Available" (12) attribute category is linked to attribute elements

of "they are available", "readily available", "commonest floor here", "they are locally sourced", and "it is done faster".

These findings reinforce the fact that prospective house owners associate having a beautiful, appealing and attractive housing environment as a high premium for social identity and self-expression, and to guaranty the desired quality of housing space which impacts on their quality of life. This finding is parallel to the findings of Bernard et al. (1993, p. 82) that there is an obvious relationship between social identity and interiors dwelling arrangements. Their findings revealed that in France, Italy and Sweden, the upper class in each of these countries attribute a relatively higher value to the aesthetic function of the interiors and the distinctive function of the decoration of the home interiors. Further findings in these countries show that the middle classes with ascending mobility convey their social status by being taste-makers, whereas those of the younger generations commonly repeated the conventional decorative treatment of their parental homes (p.76).

The need to have a hygienic housing interior space and environment is central to engendering a healthy housing environment thereby guaranteeing healthy life of the family. Bluyssen (2009 p.4) argues that 'unhealthy indoor environment' could result to diseases and disorders to the human body; while Ranson (1991, p.16) argues that poor indoor air quality as well as using toxic or otherwise unsuitable building materials affect the health of the housing occupants. The hygienic characteristic attributes of ceramic tiles floor linkages as mentioned earlier suggest that when the floor is cleaned, it will not otherwise give foul odors that are associated with un-kept and dirty floors; which will be circulated by the air movement and be inhaled by occupants. The "easy to clean" attribute of ceramic tiles floors implies that it removes the cumbersomeness of having to scrubbing or using chemical cleaning disinfectants that may be harmful to health.

In summary, choosing and preferring housing interior finishes materials that promote a healthy environment is of utmost significance to prospective house owners in Yola-Nigeria. This promotes several benefits such as elimination of sicknesses prone environment; inability to enhance germs infestation; elimination of enhancement of diseases; removes unnecessary odors; removes cleaning discomforts; having a place that is hygienic; having good ventilation and breathing better and fresh air among others.

The value orientation of the respondents does not have any motivation from hedonic point of view as it regards this particular attribute. However, some few motivational values have been activated as the reasons for preference of this attribute. Strongest among them is the motivation to accomplish more in life. They linked the ease of cleaning of ceramic tiles to saving energy, saving time, and saving money; which will be channeled to other areas of life's endeavors which will make them to achieve and accomplish more in life.

It is obvious that people prefer to finish their houses with materials that will make them to have easy life orientation from the point of view of maintaining the house with minimal cost. They will prefer materials that will make an appealing and appreciative environment that will make them feel fulfilled in life. Everybody will prefer to live in a healthy environment that promotes the health status of those living with him. This makes for a healthy security scheme in housing environment. The cumulative impact of this is the maximization of person-environment congruence (PEC). It is our humble view that there exist huge research potentials in the area of housing interior space quality, and the reasons for house owners to prefer a set of interior finishes for their housing spaces. Most researches conducted dwelled more in the area of housing spatial configuration and housing location. A lot need to be done in the area of housing interior finishing putting more quality to the spatial orientations being studied and of course housing design proposals for interior finishes that promote cleanliness of the housing environment.

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