

LADDERING AS A RESEARCH TECHNIQUE FOR MEASURING HOUSING CHOICE AND PREFERENCE

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ABSTRACT

The concept of the Laddering technique is composed of a series of interview questions. The purpose of these questions is to uncover the hidden links between the choices an individual makes and the underlying motivations behind those choices. The insight gained from this process is invaluable and has numerous practical applications. Laddering is a methodological measurement technique that the Means-End Chain (MEC) model utilizes. Clinical psychologists first introduced the laddering technique in the 1960s, as a method of understanding people's core values and beliefs. This paper reviews the laddering methodological technique, and presents some research examples conducted within the domain of housing environment research.

Keywords: Laddering, Means-End Chain, Content analysis and Housing.

INTRODUCTION

The Laddering technique is powerful, because it provides a simple and systematic way of establishing an individual's core set constructs on how they view the world. Laddering is well established in the field of psychology, and its success has led researchers in other industries (including Architecture) to adapt its core tenets to their fields. Laddering technique 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 modelling 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 (of any product) 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 endeavours. 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, 2007a). Reynolds and Gutman (1988) assess that laddering involves a tailored interviewing format using primarily a series of directed probes, typified by "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 (Costa *et al.*, 2004).

The Means-End Chain (MEC) Model

Laddering technique is methodologically operated within the research domain of 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. 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)

METHODOLOGY OF LADDERING INTERVIEWING TECHNIQUE

The traditional MEC methods as outlined by Gutman (1982) and the methods used by earlier works (Reynolds & Gutman, 1988; Coolen & Hoekstra, 2001; Coolen *et al.*,

2002; Tania *et al.*, 2006; and Jusan, 2007a, 2010a, b) conducted within the framework of MEC formed the base from which the study by a laddering method, especially on the qualitative level. The qualitative data collection method is the semi-structured, one-on-one interviews called "laddering".

This interviewing techniques aims at eliciting Attributes-Consequence-Value (A-C-V) elements from respondents, drawing information from the choices and preferences of housing attributes. The attributes elicitation through the survey questionnaire could be carried out as the first layer "concrete" attributes, while the attributes elicited through the laddering interviews are the second layer "abstract" attributes.

Prioritized Questioning Structure

In conducting laddering interviews, the right questions may be difficult to come by, and the interviewee may be nervous or uncomfortable with the line of question. To ease this dilemma, Wansink (2003) suggests and sums up the main points that should be prioritized in a laddering interview as:

- a. Ask questions that can reveal personal reasons
- b. Ask questions that lead the person to think and answer with a sentence, not just responding with a "yes" or "no"
- c. Keep asking "why"
- d. Question people's reasons for their answers
- e. Allow the questioning to flow
- f. Ask questions that give respondents' free reign to answer the questions as they feel is more appropriate and
- g. Watch the people's facial expressions as they answer the question and listen to the tone of their voices.

The Frame of Laddering Interviews

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, 2007a; Coolen & Hoekstra, 2001).

These phases are for the purpose of measuring and analyzing the various elements and the linkages between them in MEC. The qualitative data collection technique for a hypothetical housing situation in the one-on-one laddering interviews can be executed in three phases:

- i. Elicitation of abstract housing attributes
- ii. Identification of the housing attributes benefits (consequences)
- iii. Identification and disentanglement of personal values

Data Analysis and Interpretation

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, 2007a; 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.

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. An **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).

Content Analysis Method

Content analysis is the method for analyzing the data generated from the laddering interviews. Neuendorf (2002 p. 1) defines content analysis as the systematic, objective, quantitative analysis of message characteristics; which involves the careful examination of human interactions. Weber (2004 p. 117) describes content analysis as a research method that uses a set of procedures to make valid inferences from texts. Leary (2008, p. 103) relying on the works of Berelson (1952), Rosengren (1981 and Weber (1990), describes this analytical technique as "a set of procedure designed to convert textual information to more relevant, manageable data". He assesses that the central goal of content analysis is to classify words, phrases, or other units of text into a limited number of meaningful categories that are relevant to the researcher; and that any text can be content analyzed, whether it is written material or transcripts of spoken material (p. 104).

Leary (2008, p. 104) outlines two steps in content analysis as:

- i) The first step is to decide what units of text will be analyzed- words, phrases, sentences, or whatever; and,
- ii) The second step is to define how the units of text will be coded. The researcher could decide to either,
 - a. Classify each unit of text into one of several mutually exclusive categories; or
 - b. Rate each unit on some specified dimensions (p. 104).

The content analysis of the transcribed laddering data is to be done within the context of the traditional MEC methods (Reynolds & Gutman, 1988) and Weber's (2004; 1985) methods. The basic element of analysis of the study is "word", as posited by Jusan (2010b), and "phrases" and "sentences" as suggested by Leary (2008). The first stage of content analysis is by recording the entire set of 'ladders' across all the respondents; thereafter, the codes reflecting what was mentioned were developed. The coding classification is to be categorized into three basic levels of attributes, consequence, and value (ACV). This is further broken down into individual summary codes. For coding of values that appeared in laddering interviews, the value domains of Schwartz (1994, 1992) are the sieving frame of reference.

PREVIOUS STUDIES CONDUCTED WITH LADDERING TECHNIQUE (EXAMPLES ON USING LADDERING TECHNIQUE FOR HOUSING RESEARCH)

In this section, the paper highlights the applicability of laddering technique in housing research, by reviewing in brief; previous works that utilized MEC model in their housing research. It is imperative to note that the adaptation and application of MEC model in housing research is still at its early stage, as a result, literature on this area is scarce (Jusan, 2007a). He adjudges the works of Coolen and Hoekstra (2001) on housing preference in the Netherlands as probably the first attempt to apply MEC research method to measure the appropriateness of the design of the built environment. Jusan (2007a) while following the footsteps of Coolen and Hoekstra (2001) used the MEC model as a research tool to test and measure housing personalization in Malaysia. Zinas (2012) also applied the MEC methods in his research to test and measure housing interior preference and choice in Nigeria. This paper will only highlight the works of Zinas (2012) that applied the laddering technique.

Elicitation of Abstract Attributes

The laddering interviewing techniques aims at eliciting Attributes-Consequence-Value (A-C-V) elements from respondents, drawing information from the choices and preferences of housing attributes made through the survey questionnaires. The attributes elicited through the survey questionnaire are the first layer "concrete" attributes, while the attributes elicited through the laddering interviews are the second layer "abstract" attributes. This paper only emphasized the qualitative methods that elicited the abstract attributes.

Example Sample

This section presents sample laddering interviews with respondents and their responses to elicit the abstract attributes elements: This interview sample is a follow up to the choice of plywood as a material for interior walls finishes:

Interviewer's question posed to respondent: *Why is Plywood walls finish important to you?*

Respondent: *Based on the options I was given, plywood is, one, it is easily accessible. Two, the finishing is superb. It looks beautiful- you know am somebody that likes beauty. Most masons are not really good at their job, but if you bring somebody who knows how to use plywood in the house; it makes the work beautiful- am talking of workmanship- skilful workmanship.... the finishing is always beautiful. Because some people know how to use plywood, and when I run into somebody that knows how to use plywood on the walls, it's always beautiful, it's beautiful. That is why I go for plywood. Plywood tends to absorb heat, especially.... plywood will absorb heat and it does not release the heat. And when I see plywood, there are different specifications of plywood; I will prefer black afara plywood because it comes out good, and black afara is one of the good woods that when you use it, apart from beauty, it absorbs heat.*

The laddering is not conclusive yet. Follow-up laddering questions will come up based on the response above. Below is one of the follow up sample questions that will emerge from this response:

Question: *Why is 'easily accessible' important to you?*

Response: *Well, looking at the prevailing cost aspect of it, you discover that building a house now is money. Secondly, availability of plywood- it is not something you have to travel too far to go get. It is easily available, and also, although it is a little bit expensive, but it's not that too expensive that one cannot buy. If it not easily accessible, then transportation will add another cost to my building; because, for me to get it from a far place,.... it's a waste of resources, but if it's easily accessible, all it takes is a phone call and you get it. It reduces the cost of transportation, and if you add the cost of transportation to that of the building, it's skyrocketed, which you have to cut down; because in a building project you have to cut down cost.*

This line of questioning goes on until the attribute-consequence-value ladders have been established. From the two samples outlined above, abstract attributes and consequences elements have been established.

The content analysis of these two samples above revealed and established the following abstract elements of plywood as a wall decorative material:

Elements Identification

Table 1 reveals elements containing 'attributes' elements (13no) and 'consequences' elements (3no) only. Elements from response #1 are all attributes elements, with 4 other elements ("availability of plywood"; "it is easily available"; "not too expensive"; & "it is affordable") from response #2; while "you don't travel far to get it"; "it reduces the cost of transportation"; & "cut down cost", are consequences elements.

Table 1: Identified Content Elements from the Sample

Content Elements from Response #1	Content Elements from Response #2
<ul style="list-style-type: none"> • Easily accessible; • Finishing is superb; • It makes the work beautiful; • Finishing is always beautiful; • It's always beautiful; • Tends to absorb heat; • It does not release heat; • It comes out good; • It absorbs heat; 	<ul style="list-style-type: none"> • Availability of plywood; • You don't travel far to get it; • It is easily available; • Not too expensive; • It is affordable; • It reduces the cost of transportation; • Cut down cost;

None of these identified elements is a 'value' element. The explanation of this scenario is due to the fact that the laddering interview has been pursued conclusively to be able to elicit the value elements. From the sample questions posed to the respondent and the responses, only "easily accessible" element was followed up which generated response #2 elements, the remaining eight elements' follow up laddering interviews have not been included in this paper.

Categorization and Coding of the Elements

After identifying the content elements from the transcribed laddering interviews, the elements are then categorized and coded.

Table 2: Elements Categorization/Coding

Category	No of Elements	Level
Beauty (B)	5	Attributes
Environmental Friendly (EF)	3	Attributes
Affordable (AF)	2	Attributes
Available Materials (AM)	4	Attributes
Saving Resources (SR)	2	Consequences

From Table 2, five (5) elements ("finishing is superb"; "it makes the work beautiful"; "finishing is always beautiful"; "it's always beautiful"; & "it comes out good") can be categorized as "beauty" elements and coded as "**B**" (codes are researcher's prerogative). Three elements – "tends to absorb heat", "it does not release heat", and "it absorbs heat" – can be classified and categorized as "environmental friendly", and coded as "**EF**". Cost related content elements ("not too expensive", "it's affordable",) can be categorized and coded as "affordable" and "**AF**" respectively. Two consequences elements - "cut down cost", and "it reduces the cost of transportation" – can be categorized as "saving resources" and coded as "**SR**"; while these elements, "easily accessible", "availability of plywood", "you don't travel far to get it", and "it is easily available", can be categorized as "available materials" and coded as "**AM**".

These are few examples of the steps to take in dealing with the laddering technique. Other advanced analysis steps and interpretation of the analysed data are not being included in this paper due to their complex nature, besides the fact that the few

sample laddering interviews did not get to achieve the “value” elements level. (Full laddering analysis and interpretation of can be made possible with another article).

CONCLUSION

There is no rule-of-thumb as to the ideal place and time where and when face-to-face laddering interviews are to be conducted; but it should be within convenient schedules of both parties- the interviewer and the interviewee. Roulston (2010, p.99) posits that interviews are usually scheduled at the convenience of both interviewer and interviewee; and that qualitative researchers need to conduct interviews at any time and place (Roulston, 2010, p.100). This position is identical to the position of Jackson (2006, p. 81; 2009, p. 93) that face-to-face interviews may be conducted anywhere – at the individual’s home, on the street, or in a shopping mall. She outlines advantages of these personal interviews as firstly, they allow the researcher to record nonverbal responses as body language and expressions; secondly, participants usually devote more time to answering the questions than they would in a telephone surveys; and thirdly, personal interviews usually have a fairly high response rate; which rate he gave as around 80%, relying on Dillman (1978) and Erdos (1983).

McBurney and White (2007, p.244) posit that personal interviews have the advantage that the interviewers can establish rapport with the people being interviewed. They further assess that interviewers can direct the attention of the respondents to the material and motivate them to answer the questions carefully. Interviewers may be able to notice when respondents seem to misunderstand a question and explain its meaning and probe for more complete answers when a respondent gives a brief answer or one that does not respond to the question.

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.

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