Chapter 9

Conjoint Analysis with fMRI:
A Novel Analytical Approach to Neuromarketing

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ABSTRACT

Functional Magnetic Resonance Imaging (fMRI) is a very effective tool in neuromarketing. However, time limits, subject fatigue, fMRI costs, and participants' concentration are problematic. Conjoint analysis and its cards enable shortening the time and providing more attributes for evaluation. Conjoint analysis models of orthogonal matrices keep the amount of conjoint cards to a minimum which shortens the time spent in the fMRI machine and thus lowering costs. All conjoint cards are different and keep subjects concentrated during the test. fMRI is an efficient analyzing method of neuronal architecture and functions for the identification of the brain areas and networks. Conjoint analysis and fMRI are strong, combined methods to analyze customer needs and desires.

INTRODUCTION

Functional Magnetic Resonance Imaging (fMRI) is a very effective tool in neuromarketing research and analysis. However, as subjects cannot remain long inside the fMRI tube, there is the need for a method to shorten the research time. For researchers, limited time, subject fatigue (Nakagawa et al., 2013), fMRI costs (Sample & Adam, 2003), and the ability to keep subjects concentrated (Laufs & Tagliazucchi, 2014) are problematic. Regarding the last issue, one answer or solution may be conjoint analysis and its cards which allow shortening the time by providing more attributes for analysis regarding products and services. There is a way to improve fMRI research techniques by implementing a mixed method approach through conjoint analysis. This chapter introduces these two methods and describes the advantages of this type of research.

Conceptually, conjoint analysis should be examined holistically because it is not limited to just one method but rather combines different procedures. The fMRI is the most efficient method compared to other neuromarketing methods of analysis of neuronal architecture and functions. EEG or MEG may be applied, but they do not provide the deep data on human brain functioning as does the fMRI. As conjoint

analysis reveals the most meaningful attributes and their subgroups for the product or service, the fMRI connect these particular attributes (from conjoint cards) in the subjects' brain. Conjoint analysis and fMRI combined provide a helpful and effective method to analyze customer needs and desires.

Data Collecting Process in Conjoint Analysis

Conjoint analysis can be used as providing methodology for operationalizing the conceptual basis in a conjoint measurement framework (DeSarbo, Huff, Rolandelli, & Choi, 1994; Karabatsos, 2001). A prestudy must be conducted to find relevant attributes for the analysis, and these attributes can be discussed beforehand with customers, employees, or managerial staff. Sometimes the attributes are discussed with employees rather than with customers. In this manner, employees are involved in the study contributing with their own ideas about meaningful attributes concerning customers. On the other hand, researchers may find good attributes by themselves.

The Attributes in Conjoint Analysis

Of the attributes all the factor levels could be discrete, but one of them should be a continual factor. The discrete factor levels could be categorical and no assumption should made about the relationship between the factor and final scores or ranks. Continual factors sometimes demonstrate linear relationship which means the scores or ranks are expected to be linearly related to the factor. For example, price is ideal for the continual factor because if a person has learned to be loyal to a specific brand, the level of arousal he experiences in a purchasing situation may be quite low, and the individual simply selects the preferred brand and disregards the price. However, if the desired item is not available, high degrees of arousal capacity would remain the same although the actual level of arousal differs. It is only the degree to which the arousal capacity is activated in a specific situation that is dependent on the purchasing experience and on the situational characteristics on that occasion (Rajaniemi, 1992, p. 70).

Buyers are not all similar in their preferences and different preferences may require different product design responses. This, of course, enforces market segmentation and product differentiation. More specifically, the underlying principle is that if discernibly different buyer groups exist, special attention should be paid to the need for correspondingly differentiated product designs. The more important the differentiating characteristics of the buyer groups, the more important it is to take these characteristics into account in designing products.

The following relationship is also unveiled: the higher the level of product design testing among buyers, the greater the likelihood of identifying buyer's perceptions. Additionally, the more attributes are identified, the more effective the product design development process; the ease of segmenting buyers on the basis of attributes, and the desirability of design differentiation. The early identification of buyer-perceived attribute gaps may lead to identification of designer-caused attribute gaps (and vice versa) (Zaltman, LeMasters, & Heffring, 1982, pp. 129–135). Anttila (1990) highlighted that "only those particular product attributes which are salient or determinant to an individual should be used in the multiattribute model. The salient product attributes affect most significantly the total evaluation of the product in a brand choice situation. The choice among alternative brands is then assumed to be based on the salient attributes" (p. 107).

A choice between unattractive alternatives proves more difficult than choosing between two attractive alternatives. According to Nagpal and Krishnamurthy (2008), this is due to the nature of the task at

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