

# INVESTIGATING AND EVALUATING THE EFFECT OF NEURO MARKETING ON CONSUMER BEHAVIOR WITH EMPHASIS ON CONSUMER LOYALTY (CASE STUDY OF SAMSUNG PRODUCTS)

*INVESTIGANDO E AVALIANDO O  
EFEITO DO NEURO MARKETING NO  
COMPORTAMENTO DO CONSUMIDOR  
COM ÊNFASE NA LEALDADE DO  
CONSUMIDOR (ESTUDO DE CASO DE  
PRODUTOS SAMSUNG)*

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**Abstract:** Neuromarketing studies depending on the purpose of marketing is trackable in different areas of application. Market segmentation is a practical way to categorize customers based on the needs and tastes. This is often done with demographic data, such as age or psychological data, such as irritability, but it is also possible to classify individuals based on brain differences that cannot be extracted directly from demographic or psychological data. The purpose of this study was to investigate the effect of neuromarketing on consumer behavior and customer loyalty. The statistical population of the research is Samsung's customers in Qom province at 2018. According to the nature of the relationships and variables, using 30 available candidates, which were divided into two groups: control and sample, relationships between research variables are investigated. Research findings showed that the use of neuromarketing techniques has a significant effect on consumer behavior and customer loyalty.

**Keywords:** neuro-marketing, consumer behavior, customer loyalty.

**Resumo:** Estudos de neuromarketing, dependendo da finalidade do marketing, podem ser rastreados em diferentes áreas de aplicação. A segmentação de mercado é uma maneira prática de categorizar os clientes com base nas necessidades e gostos. Isso geralmente é feito com dados demográficos, como idade ou dados psicológicos, como irritabilidade, mas também é possível classificar indivíduos com base em diferenças cerebrais que não podem ser extraídas diretamente de dados demográficos ou psicológicos. O objetivo deste estudo foi investigar o efeito do neuromarketing no comportamento do consumidor e na lealdade do cliente. A população estatística da pesquisa é de clientes da Samsung na província de Qom em 2018. De acordo com a natureza das relações e variáveis, utilizando 30 candidatos disponíveis, que foram divididos em dois grupos: controle e amostra, as relações entre variáveis de pesquisa são investigadas. Os resultados da pesquisa mostraram que o uso de técnicas de neuromarketing tem um efeito significativo no comportamento do consumidor e na lealdade do cliente.

**Palavras-chave:** neuromarketing, comportamento do consumidor, fidelização de clientes.

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## Introduction

Today, the world is changing rapidly, and today humanity is expanding his science at great speed in many areas. Along with the growing growth of technology, human recognition as the key to these developments is at the top of the agenda. Like other sciences, marketing has focused its development on human emotions (Kotler et al., 2002). Obviously, a buyer will make a purchasing decision during shopping based on the processes in his brain. However, the brain is dealing with very complex decisions and can hide these decisions from the person so that he does not know how he makes these decisions (Barahooni, Hosseini, 2013). In the meantime, neuroscientists have tried to use their knowledge of marketing as well. The approach taken by this intention is neuro marketing.

Neuromarketing, is an interdisciplinary science that is rapidly identify consumer research around the world is emerging. It is also an innovative discipline in marketing research that challenges the traditional marketing model to improve understanding of the process of purchasing behavior. Neuro marketing is a method that examines the process of customer decision making for purchase (Bayan et al.2014).

Neuromarketing studies depending on the purpose of marketing traceble in different areas of application. Market segmentation is a practical way to divide customers based on the needs and tastes. This is often done with demographic data, such as age or psychological data such as irritability, but it is also possible to categorize people based on brain differences that are directly related to demographic data or psychology cannot be extracted (Venkatraman et al., 2015). Pricing strategy is one of the successful experiences of using nerve marketing (Karmarkar et al., 2015). Also, the development of new product and brand are also prerequisites for the use of nerve marketing (Pozharliev et al., 2015). In one of the early researches on neuromarketing, McClure et al. (2004) stated that brain activity has been influenced by the brand of these beverages in response to drinking Coca-Cola and Pepsi. Studies like this have the ability to examine the brain's response to emotional data (tasting) and brand information (labels). One of the most important areas of customer behavioral studies is the study of customer loyalty. One of the most important marketing theories in the field of loyalty is that a slight increase in loyal customers will significantly increase the profitability of a business (Reichheld, 1993). Scientists have observed that a 5 percent increase in customer loyalty has led to a 125 percent increase in corporate profits. Industry stakeholders are well aware of the numerous benefits of customer loyalty and are trying to increase it in various ways. However, most studies have investigated this factor only in the area of product / service re-purchasing, while the size of this factor is very large (Yoo and Bai, 2013).

Another area that has seen dramatic changes is the realm of advertising. It is clear that everyone considers advertising as an important means to reach a customer. One of the most important parts of advertising is media advertising. It is defined on media advertising that: media is the channel through which messages reach the audience; in this message transmission, the content is affected by the communication device. The sender of the message must send his message in the form of a text (in books and newspapers) or an image (on a film or television) or a voice (radio). In delivering the message, attention should be paid to qualitative aspects, and in fact this is an important factor in the credibility of the media. There are many debates about the impact of the propaganda media, but the concept of interaction and media capacity is one of the most important ones. These two concepts have become more prominent with the expansion of the influence of modern communication technologies; in a way that challenges the simple communication model (the direct transmission process and one-way information from source to addressee) and the ability to receive feedback as well as the capacity to analyze feedback is taken into consideration (Ghochani et al., 2013). Studies have shown that media spending worldwide is rising sharply (from \$ 11.36 billion per year in 2013 to \$ 17.74 billion in 2014, equivalent to an increase of 56.2%), while advertising Sales have also been boosted (Kumar et al., 2016). Any form of advertising imposes huge costs on the company. One of the best ways to reduce advertising costs is to get loyal customers. Earlier, it was stated that loyal customers are highly profitable for companies. They advertise at no cost to the company and are always considered to be a good sponsor of the company.

Studies on the impact of neuro marketing on customer behavior at the international level are very few, including the following:

Mansoori (2013) in a dissertation titled “Brand Development with Neuro Marketing Approach”, a neuro marketing approach based on a brand-driven process model is considered as a tool to enhance the insight or improve the performance of the brand development process.

Rahimi (2014) in his dissertation titled “The Impact of neuro markers on consumer behavioral factors and marketing stimulies”, has been concluded that neuro marketing has a major impact on customer buying behavior, price, distribution, and product marketing as marketing data.

Tavallayi et al. (2014) in an article titled “Reviewing the Neruro Marketing Activities on Online Consumer Shopping Online”, have been identified the most important applications of neuronal marketing in the online environment and concluded that the most important applications of nerve marketing in the online environment are: : Clever selection of site photos, aggregated verification effect, proposer systems, small requests in the web, provision of appropriate options, ordering options, adding unjustified options , Scarcity, instant and immediate benefits, proper site layout, zero number display, pricing, and confidence building.

Gharegozlu (2014) in a paper titled “The role of neuro marketing on consumer purchasing behavior”, has investigated the goal of neuro marketing and has shown that feelings of customer loyalty to the product and brand, and as a result of their purchasing decisions, have a significant impact.

Horská & Berčík (2014) has investigated the effect of lighting on the purchasing decisions of consumers and the perception of lighting on the food market. Using EEG equipment in simulated conditions, they discovered true consumer preferences for different lighting conditions (color temperature, color rendering index) for the selected type of food.

Colaferro & Crescitelli (2014) investigated the new information that can be obtained by means of neuromarketing and whether it helps clarify knowledge about consumers. They performed an exploratory study involving review of the literature and in-depth interviews with Brazilian and international specialists. Their conclusion is that neuromarketing – or the application of neuroscience in the marketing area – can shed light on consumers’ reactions to marketing actions.

Bercík et al. (2016) using neuroimaging and biometric methods have identified the impact of music on the emotional response and merchandising of goods on customer perception when selecting food, based on which they have established specific recommendations utilizable in practice in order to improve selling strategies, sales culture, and ultimately maximize profits.

Trimble, Wang & Kennon (2016) showed the use of EEG and eye-tracking data to analyze consumer behavior is discussed. Fusing EEG and eye-tracking data together integrates a consumers’ affective (emotional) and cognitive responses, providing a comprehensive understanding of consumers’ decision-making process. In this paper, an overview of the methods used for the analysis of EEG and eye-tracking data and how these methods can be fused together is also provided.

Stanton (2017) reviewed the current literature on the actions of the steroid hormones testosterone and estradiolin shaping humans’ behavior within two applied contexts, specifically consumer behavior and decision making (both social and economic). The theoretical argument put forth is that steroids shape these everyday behaviors and choices in service to being more competitive in achieving long-term goals related to resource acquisition, mating success, and social dominance. In addition, a discussion of the increased research focus on the role of steroids in other applied business domains will highlight the relevant applications of basic science discoveries in behavioral endocrinology.

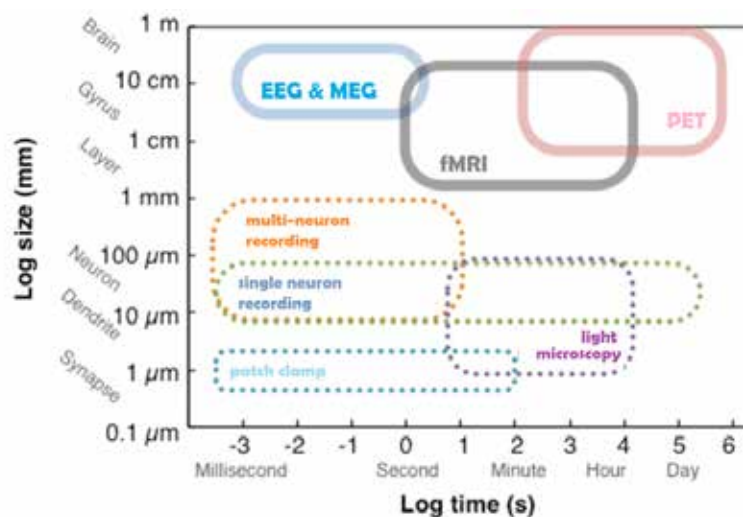
What distinguishes our research from the aforementioned works is the study of the relationship between neural marketing, consumer behavior and customer loyalty, which has not been evaluated in past research.

## Neuromarketing

Neuromarketing is the use of neuropsychological and physiological techniques to obtain new perspectives on customer behaviors, preferences and decisions as well as marketing cognitive behaviors. Neuro marketing is looking for information and views beyond the methods and techniques known by traditional studies aimed at reforming the theory and practice of marketing (Plassmann et al., 2015). Another goal is also to increase the accuracy of predicting customer behavior as known models (Venkatraman et al, 2015). Neuro marketing is carried out in a variety of ways.

The most important neuro marketing methods used in this area are: magnetoencephalography (MEG), Electroencephalography (EEG), functional magnetic resonance imaging (fMRI), positron emission tomography (PET). The common feature of these methods is that these methods measure the brain function in an indirect way. MEG and EEG. Electromagnetic effects record neural activity in large areas of the brain that extends through the scalp, with excellent instantaneous resolution in milliseconds, but poor spatial resolution. In contrast fMRI assess the effects of the oxygen composition of neuronal activation on blood flow and has a good spatial resolution, but it has a poor instantaneous resolution in seconds. Eventually, PET, which uses radioisotopes to label brain attachments, has few spatial and temporal clarity, but has an excellent ability to identify neurotransmitters of interest. Figure (1) represents the spatial and temporal characteristics of the techniques for measuring neuronal activity on a logarithmic scale.

**Fig 1,** Spatiotemporal characteristics of techniques measuring neural activity in logarithmic scale. Boxes in solid line represent noninvasive methods used to monitor human brain activity. Those in dashed lines represent invasive methods typically restricted to monitoring brain activity in nonhuman animals (Hsu, 2017)



Nevertheless, neuro marketing is not the only measure of brain activity and physiologic activity, in a laboratory environment, direct brain manipulation allows for causal conclusions on the processing of marketing affairs. For example, determining the relationship between blood testosterone levels can be verified by decision making (Lichters et al., 2016). Despite the high efficiency and attractiveness of this method, nerve marketing is a costly method (Stanton et al., 2017).

### Neuromarketing and customer behavior scrutiny

For decades, marketing research methods have aimed to explain and predict the effectiveness of advertising campaigns. For the most part, however, conventional techniques have failed miserably. Since emotions are strong mediators of how consumers process messages, understanding and modeling cognitive responses to selling messages has always been a methodological challenge. For instance, researchers have primarily relied on consumers' abilities to report how they feel about a particular piece face interview, a survey, or in a group setting such as a focus group. Unfortunately, these methods have considerable limitations. First, they assume that people are actually able to describe their own cognitive process which we now know has many subconscious components. Second, numerous factors motivate research participants to distort the reporting of their feelings, including incentives, time constraints, or peer pressure (Morin, 2011).

In this challenging context, the emergence of neuroimaging techniques has offered exciting methodological alternatives. Such techniques finally allow marketers to probe the consumers'

brains in order to gain valuable insights on the subconscious processes explaining why a message eventually succeeds or fails. They do so by removing the biggest issue facing conventional advertising research, which is to trust that people have both the will and the capacity to report how they are affected by a specific piece of advertising (Ibid).

Piece of advertising. While the field of neuroscience has grown dramatically in the last decade, it has not yet fully penetrated the dark and reclusive hallways of advertising research academia. Why? First, very few marketing researchers have formal training in cognitive neuroscience. Second and more importantly, marketing researchers have long feared the public outcry against potential ethical and privacy issues introduced by the use of neuroimaging technology for commercial purposes. As a result, few scientific neuromarketing studies on advertising effectiveness have yet been published. However, the situation is changing quickly. Indeed, neuromarketing is fast becoming mainstream. Today, tracking the popularity of the word “neuromarketing” on Google shows a phenomenal progression from just a few hits in 2002 to thousands in 2010. Meanwhile, advertising agencies are beginning to clearly understand the importance of predicting the effectiveness of campaigns by using brain-based tools such as eye tracking, EEG, or fMRI. Finally, the recent weakened economy continues to put pressure on executives to predict and measure the return on the massive dollars they invest in advertising campaigns of all forms. Taking all these factors into account demonstrates that the need for innovative advertising research using the latest discoveries on the brain is both strong and timely (Ibid).

### Customer Loyalty

With the growth of competition, corporate strategies in different industries, focusing on attracting new customers to strengthen customer loyalty. Because loyalty includes benefits such as re-purchasing, positive attitude to the company, long-term commitment, willingness to continue the relationship, positive mouth-to-mouth advertising and ... or a combination of these (Davis et al., 2007). The best way to keep customers satisfied their needs and builds loyalty is through them. Early studies of customer loyalty define this factor as a behavioral pattern, which involves frequent purchase or support of a product or service (Tellis, 1988). Recent studies conducted in this area are very diverse in nature, since scientists have added attitudinal loyalty as a psychological aspect of customer loyalty to studies in this field (Hapsari et al., 2017).

To date, in the marketing literature, three basic dimensions of the concept of loyalty have been identified, including behavioral, attitude and combination dimensions (Jones and Taylor, 2007). Behavioral dimension considers loyalty as a static output of a dynamic process that includes prerequisites such as actual consumption, re-purchase, duration, longevity, abundance, market share, and oral marketing (Mushinhda et al., 2009). Loyalty attitude dimension is considered as a psychological process and measured by the level of client's impact. Trust is a key factor in building loyalty in the customer. Emotional dependency or commitment is also the next factor in this case (Yoo and Bai, 2013). The combination dimension states that behavioral dimension and then attitude alone cannot explain loyalty, and to understand this factor, these two dimensions should be studied together. Oliver (1999) argues that the creation of a sense of customer loyalty in the cognitive, emotional, behavioral and behavioral manner is created.

Loyal customers are highly profitable for companies. They advertise at no cost to the company and are always considered to be a good sponsor of the company. Scientists have observed that a 5 percent increase in customer loyalty has led to a 125 percent increase in corporate profits. Industry professionals are well aware of the numerous benefits of customer loyalty and are trying to increase it in various ways. However, most studies have investigated this factor only in the area of product / service re-purchasing, while the size of this factor is very large (Yoo and Bai, 2013).

### Research hypotheses

The use of neuro marketing techniques has an impact on consumer behavior.

The use of neuro marketing techniques has an impact on customer loyalty.

## Methodology

The research method is descriptive and in terms of data collecting method is laboratory type. This study from the view point of objective is applied research. The statistical population of this study included all customers of Samsung products in Qom province by the year 2018. According to the research method, a suitable sampling method is available through voluntary participation. The research method is based on experimental research hypotheses with pretest design, post-test with control group which is as follows:

**Table 1,** Structure of research method

Groups	pretest	post-test	post-test
Test	T1	X	T2
Control	T1	-	T2

It should be noted that both the control and sample groups included 15 people. The research method was that the participants in the study were divided into two groups, then they were assessed as the pre-test variables in both groups. Then the test group was placed under test conditions and a few adverts by Samsung were advertised, and those advertisements were designed and manufactured using neuro marketing techniques. At the end, both groups are considered as post-test of the study variables, the results is reported in subsequent sections. To measure consumer loyalty, Douwe Van den Brink et al. 2006 standard questionnaire including 25 questions with 5 Likert index is used. Also, to measure consumer behavior, the Lerman Consumer Behavior Questionnaire 2006 includes 6 questions with Likert 5-point indicator.

## Results

### Consumer Behavior

The results of the mean and standard deviation of the consumer behavior variable are shown in the table below:

**Table 2,** Descriptive results of the consumer behavior variable and its components

Group	variable		Pre-test		Post-test	
			Mean	standard deviation	Mean	standard deviation
Test	consumer behavior	15	43.13	18.36	35.86	8.98
Control		15	46.66	14.87	46.26	13.54

The results of Table 2 and Fig. 2 show that consumer behavior in the pre-test is in the experimental group with an average of 43.13 and a standard deviation of 18.36 and in the control group with an average of 46.66 and a standard deviation of 8.98. Also, consumer behavior in post-test was in the experimental group with mean (35.86) and standard deviation (14.87), and in control group with mean (46.26) and standard deviation (13.54).

Figure 2, Average consumer behavior test results

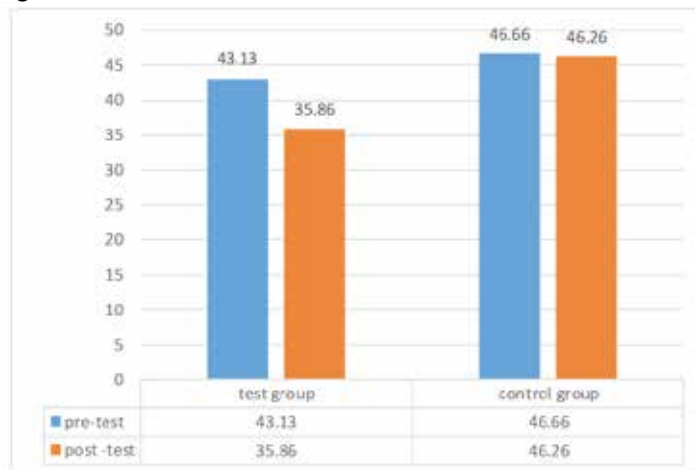


Figure 3, Comparison of the pre-test and post-test scores of the consumer behavior in the test group

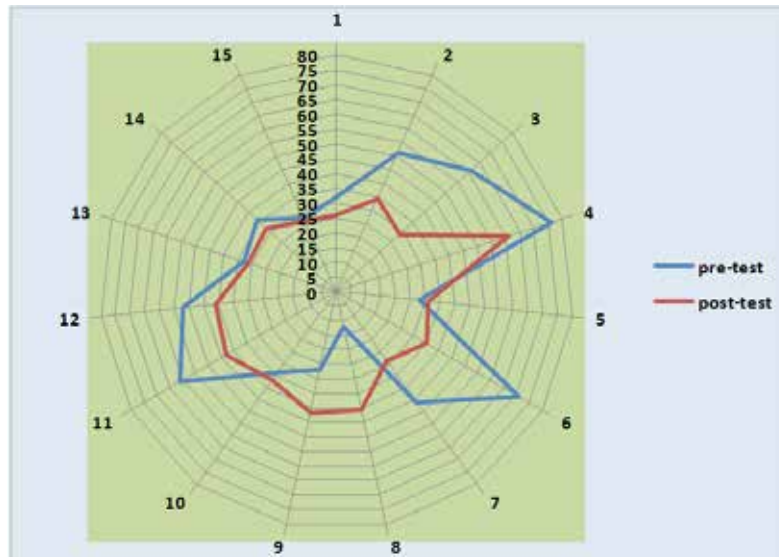
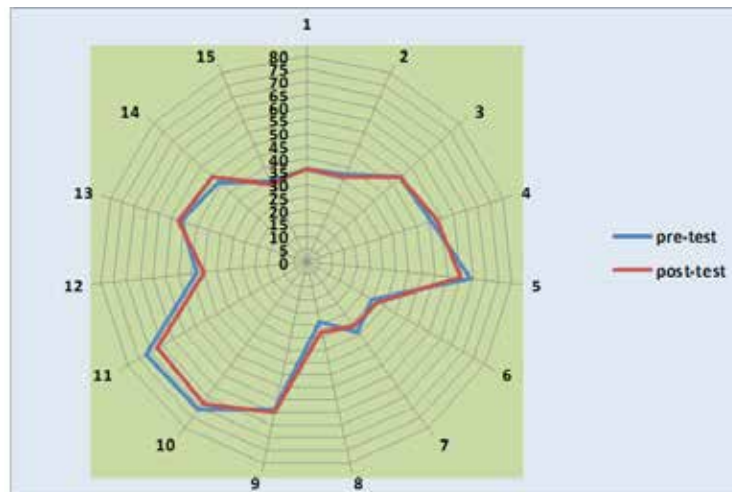


Figure 4, Comparison of the pre-test and post-test scores of the consumer behavior in the control group



### Consumer loyalty

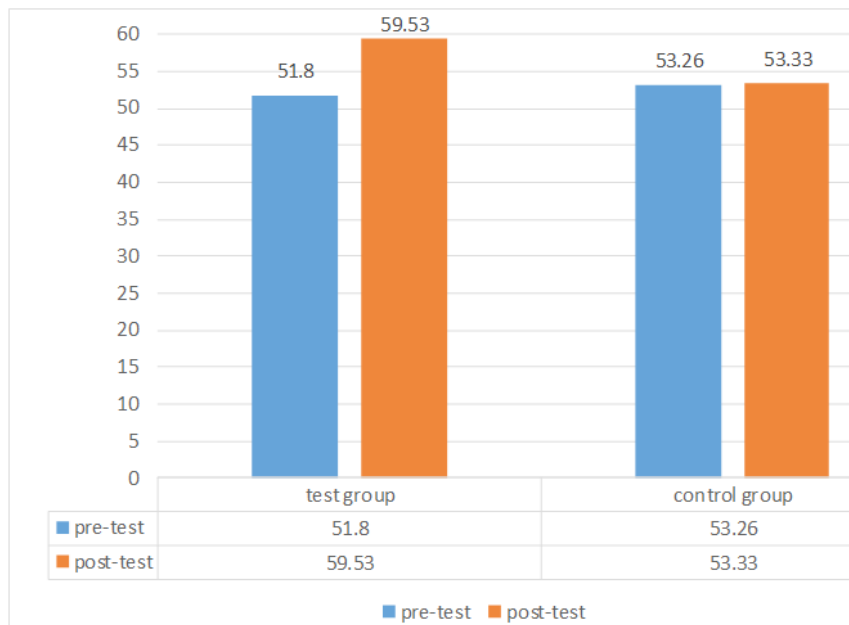
The results of the mean and standard deviation of the consumer loyalty are presented in the following table.

**Table 3**, Descriptive results of consumer loyalty and its components

Group	variable		Pre-test		Post-test	
			Mean	standard deviation	Mean	standard deviation
Test	consumer loyalty	15	51.8	26.21	59.53	13.80
Control		15	53.26	19.96	53.33	19.76

The results of Table 3 and Fig. 5 show that consumer loyalty in the pre-test in the experimental group with an average of 51.8 and a standard deviation of 26.21 and a control group with a mean of 53.26 and a standard deviation of 19.96. Also, consumer loyalty in post-test was in the experimental group with an average of (59.53) and standard deviation (13.80), and in the control group with an average of (53.33) and standard deviation (19.76).

**Fig 5**, Average Consumer Loyalty Test Results



**Fig 6**, Comparison of the scores of consumer loyalty in the test group

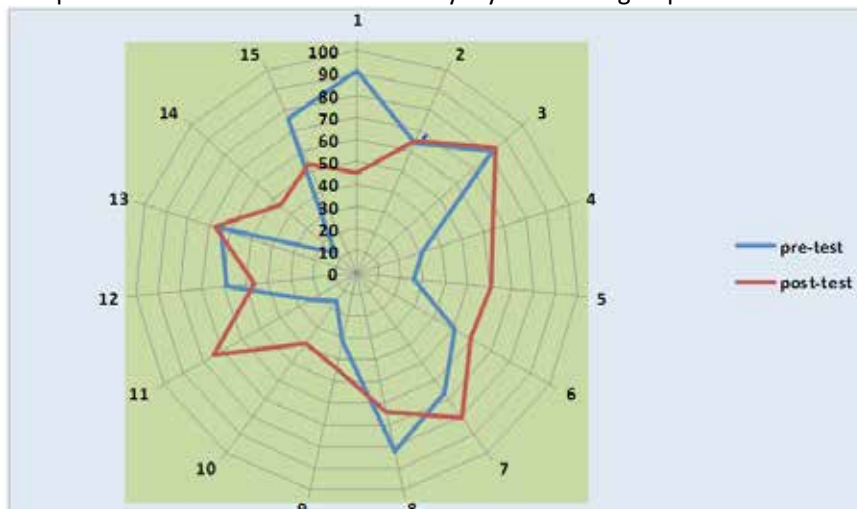
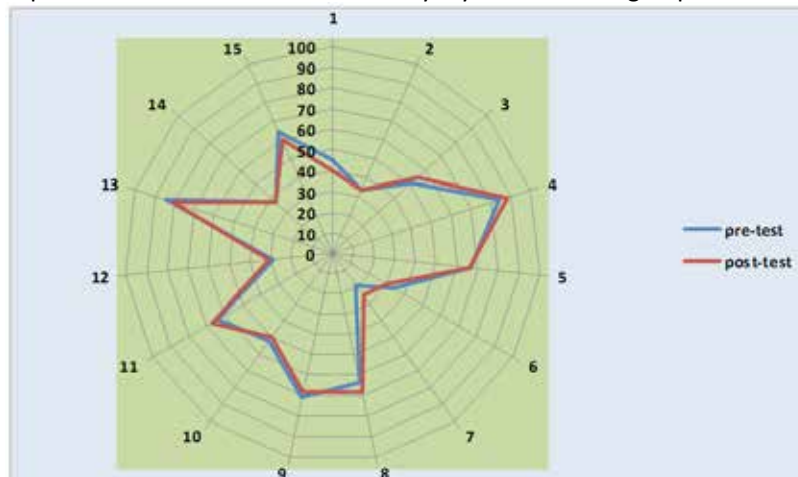




Fig 7, Comparison of the scores of consumer loyalty in the control group



## Conclusion

The first hypothesis: The use of neuro marketing techniques has an impact on consumer behavior.

As shown in Table 4, the calculated F value ( $F = 112.19$ ) is calculated with a significant level ( $\text{Sig} = 0.0001$ ) and as ( $0.0001 < 0.1$ ) as a result the value of calculated F by the 99% confidence level is statistically significant, which indicates the difference in the effect of the test conditions on the dependent variable (consumer behavior). As a result, it can be stated that the hypothesis “the use of neuro marketing techniques affects consumer behavior” is confirmed. And given the fact that the squares of Beta ( $0.806$ ) indicate that almost 80% of the variance of the dependent variable (consumer behavior) is affected by the test conditions.

The second hypothesis: The use of neuro marketing techniques has an impact on customer loyalty.

As shown in Table 5, the calculated F value ( $F = 209.8$ ) is calculated with a significant level ( $\text{Sig} = 0.0001$ ) and as ( $0.0001 < 0.1$ ) as a result the value of calculated F by the 99% confidence level is statistically significant, which indicates the difference in the effect of the test conditions on the dependent variable (consumer behavior). As a result, it can be stated that the hypothesis “The use of neuro marketing techniques has an impact on customer loyalty” is confirmed. And given the fact that the squares of Beta ( $0.676$ ) indicate that almost 67% of the variance of the dependent variable (consumer loyalty) is affected by the test conditions.

According to the research findings, it is suggested to policy makers and marketing designers to use neuro marketing techniques to enhance customer relationship and influence on consumer behavior and customer loyalty. It is also suggested to researchers that in future research the effects of neuro marketing techniques on the desire to use get also examined, also, the impact of neuro marketing techniques on consumer behavior and customer loyalty get modeled. The most important limitation of the present research was the lack of theoretical fundamentals and comprehensive research on neuro marketing in our country.

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