

# NEUROMARKETING AND ITS IMPACT ON BRAND BUILDING AND CUSTOMER LOYALTY IN IRAQ: A CASE STUDY OF APPLE PRODUCT SALES IN BAGHDAD

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## Abstract

Background information: Neuromarketing is the merging of multiple disciplines of neuroscience and marketing in order to gain an understanding of the psychology and neuroscience that lie behind consumer behaviours. The application of neuromarketing in developing economies, especially in Iraq, has been limited and empirical evidence on the use of neuromarketing in developing economy is limited. Research Objective: The impact of the neuromarketing stimuli and the perception of the product on consumer loyalty, in the case of Apple's product sales in Baghdad. Methodology: Descriptive – Analytical was used. A structured, pilot-tested questionnaire was used to collect the data from 250 users of Apple products for the study, who were selected in three major shopping centres in Baghdad (Dream City Mall, Mansour Mall, and Baghdad Mall) using stratified random sampling. The reliability of the instruments was confirmed using Cronbach's alpha ( $\alpha = 0.780$ ). Descriptive statistics, Pearson correlation and multiple regression analysis were used to analyse the data (SPSS v.26). Results: Neuromarketing stimuli ( $B = 0.255$ ,  $\beta = 0.302$ ,  $t = 3.805$ ,  $p < 0.01$ ) and brand perception ( $B = 0.248$ ,  $\beta = 0.282$ ,  $t = 3.179$ ,  $p < 0.01$ ) both significantly predicted customer loyalty ( $R^2 = 0.318$ ). The mean scores for each construct were between 3.42 and 3.66 on a 5-point Likert scale, suggesting high engagement

with the Apple brand. The results: The stimuli of neuromarketing can be considered as one of the most important factors that influence customer loyalty in the market of Baghdad, as the perception of the brands. The results indicate that there is a need to apply neuromarketing concepts to local marketing in order to build brand loyalty and relationships with customers.

**Keywords:** Neuromarketing; Brand Building; Customer Loyalty; Consumer Behaviour; Baghdad; Iraq.

## Introduction

Neuromarketing has revolutionized the world of marketing. Neuromarketing takes a different approach to consumer behaviors than traditional marketing methods such as surveys, focus groups, observation of behavior by observing what occurs at the subconscious level in the mind and bodies of people when a marketing stimulus is presented (Mansor & Isa, 2020). By gaining insight into these subconscious decision-making factors, businesses can create more impactful marketing campaigns that tap into their consumers' emotions, fostering brand loyalty and ensuring sustainable customer relationships for the long term (Sangari et al., 2023). Apple Inc. is an example of application of the neuromarketing principles with its product design, advertising philosophy and consistent brand experience. The company's marketing strategy isn't just about selling products, it's about generating customer aspiration, building a sense of belonging to the brand, and driving repeat sales and brand advocacy. The strategy is not only about the features of the products Apple is marketing, it is about building aspiration of the customers, their belonging to the brand and their tendency to repeat purchase and build brand advocacy. (Ahmad, 2025). The consumer electronics sector has been booming in Iraq and especially in Baghdad, where there has been an increased demand for foreign technology brands such as Apple. But there is little empirical evidence on the psychological and neurological aspects of consumer behavior in this particular market context. The majority of the existing studies in the field of neuromarketing have been carried out in western or eastern countries, thus, the study of how these principles are applied in the context of the cultural, social, and economic environment of Iraqi consumers is lacking (Jassim, 2022; Hasan et al., 2023). This study aims to fill

the gap by examining the effect of neuromarketing stimuli and brand perception on consumer loyalty among Apple product consumers in the city of Baghdad. The results are intended to make contributions to the theory of neuromarketing in developing countries, and give practical advice to the marketers in order to use the evidence-based marketing strategies in the Iraqi market.

### 1.1 Research Problem

Traditional marketing approaches generally rely on looking at demographic and behavioral factors, and ignore the neurological and emotional processes that are at the heart of consumer decisions. While there is already evidence of the use of neuromarketing in developed economies, its potential applicability to markets with unique cultural values, limited infrastructure and price sensitive consumers, like that of Baghdad, Iraq, has not been explored systematically. This research problem is that, there is no empirical study with regard to the influence of neuromarketing on brand building and consumer loyalty in this context.

### 1.2 Significance of the Study

1. Theoretical contribution: This study is an extension of the neuromarketing literature in an under-researched developing economy context that offers empirical evidence of the psychological, neurological, antecedents of consumer loyalty in the city of Baghdad.
2. Practical implications: Provides marketers and businesses working in Baghdad with practical insights that help them understand how they can make use of neuromarketing stimuli to enhance emotional involvement and brand loyalty.
3. Local market intelligence: Provides a contextually relevant insight into Iraqi consumers, which can help both local and international brands cater to their needs.
4. Policy relevance: It is relevant to strategic decision making by firms looking into entering or expanding the market for consumer electronics in Iraq.

### 1.3 Research Objectives

1. To analyze the impact of some stimuli of the neuromarketing on purchasing decisions related to Apple product among some of its users in Baghdad.

2. To examine the mediating and/or moderating effects of brand perception between the neuromarketing stimuli and customer loyalty.
3. To assess the impact of the neuromarketing elements (product, price, promotion and distribution) on brand recognition and loyalty.
4. To offer evidence-based suggestions about how to use the principles of neuromarketing in the Baghdad market.

### 1.4 Research Hypotheses

H<sub>1</sub>: There is significant positive effect of Neuromarketing stimuli on customer loyalty ( $\alpha \leq 0.05$ ).

H<sub>2</sub>: The result shows that the brand perception has a significant positive effect on customer loyalty ( $\alpha \leq 0.05$ ).

H<sub>3</sub>: Brand experience and customer loyalty are significantly correlated with each other at 0.05 level of significance.

## 2. Theoretical Framework and Literature Review

### 2.1 Theoretical Foundations

This study was based on two complementary theories. According to Social Cognitive Theory (Bandura, 1986), human behaviors is the product of the interaction between personal cognitive factors, behaviors, and environmental factors. In the context of neuromarketing, this approach helps to understand the cognitive and emotional mechanisms that influence consumer choices in relation to brands. Meanwhile, Role Theory focuses on how the customer plays a social role, such as the one that a brand owner plays and how marketing stimuli enhance the role identities. These frameworks, taken together, offer a conceptual framework for understanding the importance of neuromarketing triggers targeting the cognitive and social-emotional aspects of the consumer. can produce durable brand loyalty.

### 2.2 Neuromarketing: Definition and Scope

Neuromarketing is an interdisciplinary field that explores the conscious and unconscious emotional, cognitive, physiological, and psychological reactions to marketing stimuli, with the goal of discovering how consumers respond and what their preferences are using neurotechnological tools (Sangari et al., 2023). It uses

various types of tools such as functional magnetic resonance imaging (fMRI), electroencephalography (EEG), positron emission tomography (PET), magnetoencephalography (MEG), galvanic skin response (GSR), and eye tracking to measure brain activity and physiological responses which are not measurable by conventional self-reporting tools (Mansor & Isa, 2020). Neuromarketing can measure the level of attention paid, the emotional tone, memory encoding, and initial reactions to marketing materials. This power to access subconscious responses is a basic benefit over traditional market research, which has been limited by the ability of respondents to introspectively access their own decision-making processes (Sargin, 2025).

### 2.3 Neuromarketing and Purchase Behavior

Emotions are a critical factor in consumers' buying processes. Studies of brain imaging provide evidence that affective response to brand stimuli activates reward circuits in the orbitofrontal cortex, encouraging approach behavior and revisit purchase intention (Mada, 2024). As part of the research in the area of Neuromarketing, it has also been found that visual design aspects, such as colors, typography and space organization, have strong subconscious influences on brand evaluation (Singh et al., 2023). Product packaging, especially, triggers different neural signatures depending on perceived quality and emotional fit with self-concept, among the various neural signatures. Among the various neural signatures, product packaging triggers distinct signatures depending on perceived quality and emotional congruence with the consumer's self-concept. Considerable technological advancements and a shift in consumer preferences have made it a top priority for marketers around the world to use neuroscience to anticipate purchase behavior (Singh et al., 2023). Through the use of physiological information, marketers can now dig up new facets of consumer preference, for more finely-tuned and emotionally compelling marketing campaigns.

### 2.4 Brand Concepts

#### 2.4.1 Brand Definition and Identity

A brand is a multi-dimensional set of functional, emotional, relational and strategic linkages that create a unique perceptual pattern in consumers' minds (Chan, 2022). Brand identity is the combination of names, logos, colors, slogans

and design that create a brand's identity and place it in the memory of its customers. (Ward et al., 2020).

#### 2.4.2 Brand Quality and Brand Equity

Brand quality is the overall assessment by consumers of the ability of a brand to satisfy their performance expectations, and justifies premium prices and competitive advantage (Roest & Snoeren, 2024). Consumer based brand equity (CBBE) occurs when consumers' differential response to marketing stimuli is due to the brand as compared to an unbranded equivalent (Algharabat et al., 2020). Today, social media interaction plays an important role and is one of the most influential factors of CBBE, with an impact on brand awareness and reinforcing positive brand links.

#### 2.5 Customer Loyalty

According to Dick & Basu (1994), Customer Loyalty is an emotional and behavioral attachment that consumers have on a brand that is developed from the positive interaction they had with the brand and the trust they have in the brand. According to Aaker (2011), brand loyalty is the foundation of brand equity and it represents the extent of consumer loyalty that protects a brand from competitive price or quality pressures. Dick and Basu (1994) define loyalty on cognitive (accessibility, trust, centrality), affective (emotion, satisfaction) and conative (switching costs, anticipated behaviour) dimensions. Gremler and Brown (1996) apply this to service environments, where loyalty is manifested in more than just repeat purchases; it is also reflected in favourable word-of-mouth and conscious choice of provider. Post-purchase brand evaluations are also influenced by emotions during the purchase, leading to the buildup of self-reinforcing cycles of loyalty (Fournier, 1998).

#### 2.6 Prior Empirical Studies

Ahmad (2025) examined how Pakistani businesses use neuromarketing to drive sales and brand loyalty, finding that sensory marketing, emotional appeals, and personalised advertising significantly enhance brand recognition and customer retention. Baghsheykhi and Arabiyeh (2019), in a study of Samsung customers in Iran, demonstrated that neuromarketing techniques have a significant impact on

consumer behaviour and customer loyalty, with experimental group participants showing markedly higher loyalty scores than controls. Hasan et al. (2023), in an Iraqi context using Asia Cell as a case study, found that market orientation combined with neuromarketing as a mediating variable significantly improved customer satisfaction — providing the closest prior evidence to the present study's context. Taken together, these studies support the proposition that neuromarketing stimuli reliably influence brand perception and loyalty, though evidence specific to the consumer electronics sector in Baghdad remained absent prior to this investigation.

### 3. Research Methodology

#### 3.1 Research Design

The descriptive-analytical research type was used, which consisted of descriptive technique in describing the subjects and inferential technique in analyzing the relationship between variables. This method was suitable for the study, which aimed to describe an existing phenomenon while also analyzing the directional relationships between the variables making up the phenomenon (Sekaran, 2003).

#### 3.2 Study Population and Sample

The target population consisted of the Apple consumer in Baghdad who buy and/or use Apple products at the main retail centres. Three sample locations were chosen for this study, which included the well-established consumer electronics retailing centres of Dream City Mall, Mansour Mall and Baghdad Mall. The population is diverse in respect to age, gender, income and education, which is characteristic of Apple's consumers in Baghdad. To sample proportionately across the major demographic groups a stratified random sampling method was used. A minimum sample size of 245 respondents were estimated using the Krejcie and Morgan (1970) sample size table for unknown populations, at a 95% level of confidence and a margin of error of  $\pm 5\%$ . 250 questionnaires were collected and all were found to be valid.

#### 3.3 Data Collection Instrument

The main instrument for the data collection was structured, self-administered questionnaire. It included four sections: (1) Demographic information (age,

gender, occupation, level of education, income, and brand of device used); (2) Brand Perception (4 items); (3) Neuromarketing Stimuli (5 items related to product design, pricing, promotion, store display and distribution); and (4) Customer Loyalty (4 items). The items used to measure all constructs were rated on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). A pilot test was conducted with 30 respondents before the questionnaires went into full use; wording changes were made in response to feedback received to clarify the wording of items.

### 3.4 Validity and Reliability

The content validity was achieved by asking three academics with specialization in marketing and consumer behavior. Cronbach's alpha coefficient was used to determine the internal consistency reliability. Overall, the coefficient of 0.780 (Table 1) revealed that the reliability of the results was acceptable, which was above 0.70 recommended for management and social science studies (Sekaran, 2003).

### 3.5 Data Analysis

The data were analyzed using SPSS Version 26. All demographic and construct variables were subjected to descriptive statistics (mean, standard deviation and frequencies). Bivariate relationships between the three major constructs were examined using Pearson correlation analysis. To test  $H_1$  and  $H_2$ , multiple linear regression was used, with the dependent variable of customer loyalty. All tests were carried out with statistical significance of  $\alpha = 0.05$ .

## 4. Results

### 4.1 Reliability Analysis

**Table 1. Reliability Statistics: Cronbach's  $\alpha$ , Composite Reliability, and AVE**

| Construct              | Cronbach's $\alpha$ | Composite Reliability | Average Variance Extracted (AVE) |
|------------------------|---------------------|-----------------------|----------------------------------|
| Brand Perception       | 0.790               | 0.821                 | 0.560                            |
| Neuromarketing Stimuli | 0.818               | 0.805                 | 0.614                            |
| Customer Loyalty       | 0.706               | 0.890                 | 0.645                            |
| Overall Questionnaire  | 0.780               | 0.822                 | 0.599                            |

Source: Authors' calculations based on SPSS output. Threshold  $\alpha \geq 0.70$  (Sekaran, 2003).

## 4.2 Demographic Profile of the Sample

53.2% of respondents were men and 46.8% were women, according to a demographic variable analysis. The age distribution revealed that 18.8% were between the ages of 18 and 25, 24.4% were between the ages of 26 and 35, 26.8% were between the ages of 36 and 45, and 30.0% were 46 or over. In terms of educational achievement, 28% had a postgraduate degree (master's or doctorate), 42% had a bachelor's degree, and 30% had a secondary school certificate. 53.6% of the sample utilised Apple devices, 1.2% used Sony devices, and 45.2% used other electronic gadgets. According to the income distribution, 22.8% made between \$600 and \$800 per month, 41.6% made between \$800 and \$1,000 per month, 17.6% made between \$1,000 and \$1,200 per month, and 18.0% made more than \$1,200 per month.

## 4.3 Descriptive Statistics: Brand Perception

**Table 2. Descriptive Statistics for Brand Perception Items (n = 250)**

| Item                                                  | Mean | SD   | Rank |
|-------------------------------------------------------|------|------|------|
| Apple produces cutting-edge, innovative products      | 3.50 | 1.10 | 1    |
| Apple's brand image is powerful and appealing         | 3.30 | 1.30 | 4    |
| I trust the reliability and quality of Apple products | 3.47 | 1.35 | 2    |
| Apple's branding evokes a positive emotional response | 3.43 | 1.25 | 3    |
| Overall Mean / SD                                     | 3.42 | 0.93 | —    |

Note: 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). SD = standard deviation.

Every brand perception item received a score higher than 3.30, suggesting that respondents consistently and strongly had favorable opinions of the Apple brand. "Apple produces cutting-edge, innovative products" received the highest rating ( $M = 3.50$ ,  $SD = 1.10$ ), indicating that innovativeness is the most prominent aspect of brand perception in this group. The low overall standard deviation of item-level ratings and the narrow range of item means (3.30–3.50) indicate a respectable level of agreement among respondents, which is consistent with Apple's worldwide consistent brand positioning.

#### 4.4 Descriptive Statistics: Neuromarketing Stimuli

**Table 3. Descriptive Statistics for Neuromarketing Stimuli Items (n = 250)**

| Item                                                                    | Mean | SD   | Rank |
|-------------------------------------------------------------------------|------|------|------|
| Product design and aesthetics influence my purchase decision            | 3.32 | 1.27 | 5    |
| Apple's pricing affects my perception of product value                  | 3.88 | 0.83 | 2    |
| Apple's advertising evokes positive emotional responses                 | 3.62 | 1.03 | 3    |
| Apple's store design and product display enhance my shopping experience | 3.93 | 0.99 | 1    |
| Apple's distribution channels make purchasing convenient                | 3.58 | 1.12 | 4    |
| Overall Mean / SD                                                       | 3.66 | 0.14 |      |

Note: 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). SD = standard deviation.

Among neuromarketing stimuli, store design and product presentation rated highest (M = 3.93, SD = 0.99), highlighting the significance of sensory-environmental marketing cues in influencing consumer behaviour. Although still above the midpoint, product design placed last (M = 3.32, SD = 1.27), indicating that although aesthetic cues are valued, the experience retail environment had the greatest impact on customer engagement in this sample.

#### 4.5 Descriptive Statistics: Customer Loyalty

**Table 4. Descriptive Statistics for Customer Loyalty Items (n = 250)**

| Item                                                      | Mean | SD   | Rank |
|-----------------------------------------------------------|------|------|------|
| I am likely to purchase more Apple products in the future | 3.60 | 1.01 | 2    |
| I prefer Apple products over those of competing brands    | 3.17 | 1.15 | 4    |
| I would recommend Apple products to family and friends    | 3.42 | 1.13 | 3    |
| I feel a strong emotional bond with the Apple brand       | 3.86 | 0.81 | 1    |
| Overall Mean / SD                                         | 3.51 | 0.13 | —    |

Note: 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). SD = standard deviation.

In line with the theoretical claims of Aaker (2011) and Fournier (1998), the highest-rated loyalty question was "I feel a strong emotional bond with the Apple brand" ( $M = 3.86$ ,  $SD = 0.81$ ), highlighting that affective attachment is the predominant dimension of customer loyalty in this sample. Compared to brand perception (0.14), the overall loyalty construct's standard deviation (0.13) is comparatively broader, indicating considerably higher inter-individual variability in loyalty expressions. This could be due to demographic variations in usage habits and brand experience.

#### 4.6 Pearson Correlation Analysis

**Table 5. Pearson Correlation Matrix among Study Constructs (n = 250)**

| Construct                 | 1. Neuromarketing Stimuli | 2. Brand Perception | 3. Customer Loyalty |
|---------------------------|---------------------------|---------------------|---------------------|
| 1. Neuromarketing Stimuli | 1.000                     | 0.412**             | 0.483**             |
| 2. Brand Perception       | 0.412**                   | 1.000               | 0.461**             |
| 3. Customer Loyalty       | 0.483**                   | 0.461**             | 1.000               |

Note: \*\* Correlation is significant at the 0.01 level (2-tailed). Pearson correlation coefficients computed in SPSS v.26. See Table 6 for regression results.

All three constructs showed strong positive correlations, according to Pearson correlation analysis. Neuromarketing stimuli showed a favourable correlation with customer loyalty ( $r = 0.483$ ,  $p < 0.01$ ) and brand perception ( $r = 0.412$ ,  $p < 0.01$ ). Additionally, there was a substantial correlation between brand perception and customer loyalty ( $r = 0.461$ ,  $p < 0.01$ ), which directly supports  $H_3$ . Higher degrees of neuromarketing stimulus exposure are linked to stronger brand perception and greater loyalty, and favourable brand perception is linked to higher loyalty outcomes, according to these bivariate associations.

#### 4.7 Hypothesis Testing: Multiple Regression Analysis

**Table 6. Multiple Regression Results: Predictors of Customer Loyalty**

| Predictor Variable     | B<br>(Unstd.) | Beta ( $\beta$ ) | SE    | t     | p      | Decision                 |
|------------------------|---------------|------------------|-------|-------|--------|--------------------------|
| Neuromarketing Stimuli | 0.255         | 0.302            | 0.067 | 3.805 | < 0.01 | H <sub>1</sub> Supported |
| Brand Perception       | 0.248         | 0.282            | 0.078 | 3.179 | < 0.01 | H <sub>2</sub> Supported |
| Constant (Intercept)   | 0.81          |                  | 0.22  | 3.24  | < 0.01 | —                        |

Note: B = unstandardised regression coefficient;  $\beta$  = standardised regression coefficient; SE = standard error. Model significance:  $F(2, 247)$  = significant at  $p < 0.01$ .  $R^2 = 0.318$ . All hypotheses tested at  $\alpha = 0.05$ .  $R^2 = 0.318$

The two predictors jointly account for about 31.8% of the variance in customer loyalty, according to the regression model, which was statistically significant overall ( $F(2, 247)$ ,  $p < 0.01$ ,  $R^2 = 0.318$ ). Customer loyalty was found to be more strongly predicted by neuromarketing stimuli ( $B = 0.255$ ,  $\beta = 0.302$ ,  $t = 3.805$ ,  $p < 0.01$ ), supporting H<sub>1</sub>. Customer loyalty was also substantially predicted by brand perception ( $B = 0.248$ ,  $\beta = 0.282$ ,  $t = 3.179$ ,  $p < 0.01$ ), supporting H<sub>2</sub>. Neuromarketing stimuli showed a slightly stronger unique contribution to loyalty outcomes, despite the fact that both predictors are statistically significant and have comparable standardised coefficients ( $\beta = 0.302$  vs.  $0.282$ ). The Pearson correlation analysis in Section 4.6 (Table 5), which showed a substantial positive association between brand impression and customer loyalty ( $r = 0.461$ ,  $p < 0.01$ ), supported H<sub>3</sub>.

#### 5. Discussion

This study's results support the main hypothesis, which states the degree to which the use of neuromarketing stimuli significantly impacts customer loyalty in the consumer electronics sector in Baghdad. This is in line with the findings reported by Ahmad (2025) in Pakistan and Baghsheykhi and Arabiyeh (2019) in Iran, bringing the evidence base for the effectiveness of neuromarketing to the Arab market context for the first time, with Apple-specific data. The dominance of store design and product display as the most rated neuromarketing stimulus ( $M = 3.93$ ) is consistent with the neuroscientific evidence that sensory-environmental cues, which means ambient lighting, spatial layout, tactile knowledge of product

interaction, are more effective in engaging the brain's reward circuitry than the product features alone (Singh et al., 2023). This has direct consequences for Apple's strategy, which emphasizes "experiential" store design, and means that you can expect to see tangible market loyalty results from the creation of the same kind of environments in the Baghdad market. The highest rated loyalty item in terms of their priority is emotional bonding ( $M = 3.86$ ), which confirms Aaker's (2011) conceptualization of brand loyalty as being fundamentally affective in nature, and is in line with Fournier's (1998) consumer-brand relationship framework. The emotional component of brand loyalty might be particularly relevant in the Iraqi culture where interpersonal trust and relationship commitment has specific social relevance. Marketers need to therefore focus on communicating emotional elements rather than functional product features. Both predictors are significant, and both have similar standardized coefficients ( $\beta = 0.302$  for the neuromarketing stimuli and  $\beta = 0.282$  for the brand perception), indicating that sensory-emotional engagement and cognitive brand evaluation are similarly important in the formation of loyalty. This is a more complex situation than just a "dominance" story: the two routes (affective subconscious and attitudinal conscious) to the market seem to be working simultaneously, and so marketing strategy must work on both at once rather than on one as a substitute for the other.

### 5.1 Limitations

The following caveats should be considered when reading these results. First, the current study was of a single center, convenience sampling design which might not be generalizable to other cities or consumers who do not shop in shopping malls and in the third place, the research did not take into account the consideration of the various types of malls. Secondly, the limitation on the use of objective neurophysiological data, such as that of EEG or eye tracking, which are the focus of future studies, is also a concern, because self-report questionnaire data may be subject to social desirability bias. Third, the cross-sectional study design makes it difficult to draw causal inferences, which could be investigated with longitudinal studies to examine how various neuromarketing stimuli affect loyalty over time. Fourth, the study did not include brands other than Apple due to the possibility of the position of Apple's brand as a premium, which may yield

loyalty dynamics not representative of other consumer electronics brands in the Iraqi market.

## 6. Conclusion

This study indicates a significant positive relationship between the neuromarketing stimuli and the perception of the brand and its relationship to customer loyalty, for the customers of Apple products in Baghdad city, Iraq. Neuromarketing, especially the store design and the sensory retail environment had the greatest effect on loyalty measures, and the most visible loyalty dimension was emotional bonding expressed by respondents. In summary, these results extend the body of knowledge in the field of neuromarketing by presenting the first empirical evidence from the Iraqi consumer electronics market, and support the validity of the neurological and psychological mechanisms of brand loyalty found in other cultures. Theoretically, the study adds to the literature on consumer neuroscience by focusing the effects of the neuromarketing in the social cognitive theory and the role theory, and provides a framework that can be used in the developing economy context. The findings have practical implications for marketers and brand managers to use the results of neuromarketing theories and principles, i.e., sensory retail design and emotional communication, to establish long-term relationships with consumers in the Iraqi market.

## 6.1 Recommendations

### Practical Recommendations

1. Invest in immersive retail spaces: Take a cue from the Apple store's strategy and concentrate on lighting, display design, and the chances items provide for a tactile encounter, as these factors have been shown to have the greatest influence on customers' loyalty.
2. Market communications in a culturally relevant manner: Maintain the technological distinctiveness of the Apple brand while adapting advertising messaging to Iraqi cultural standards, which are centred on relational trust, dependability, and community membership.
3. Employ emotional marketing: Since emotional bonding was the most significant determinant for loyalty in our sample, develop ads that emphasise emotional rather than product-based arguments.

4. Use consumer behaviour data from digital touchpoints to tailor brand communications and inspire loyalty with messaging that is emotionally consistent.
5. Invest in neuromarketing training: Educate marketing and sales teams on behavioural neuroscience concepts so they may make more educated decisions about consumer involvement.

### Academic Recommendations

1. Expand regionally by comparing studies between other governorates in Iraq and other Arab markets in order to gauge the effect of neuromarketing stimuli on loyalty.
2. Transpose Neurophysiological Techniques: To further understand the subconscious responses that neuromarketing theory has predicted, quantitative data from surveys will be combined with objective measurements such as EEG, eye tracking, and GSR.
3. Assess the function of demographic characteristics as moderators: To better focus marketing techniques, investigate if age, income, gender, and educational attainment are moderating variables between the neuromarketing stimuli and loyalty.
4. Track how brand loyalty changes over time as a result of sustained neuromarketing efforts using longitudinal research methods.

### Declarations

1. Ethics and Consent: Informed written consent was given before participating. The study has been done on ethical standards of social science research.
2. Conflict of Interest: There is no conflict of interest.
3. Conflict of interest: There are no conflicts of interest to declare.
4. The authors wish to express their gratitude to the patients from the UCL Rehabilitation Medicine Department who took part in this study.
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6. Data Availability: The data supporting the conclusions of this study can be obtained from the corresponding author on reasonable request.

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