

Review Article



Identifying the Effective Psychologically Motivational Factors in Neuromarketing: A Systematic Review

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ABSTRACT

Objective: The role of unconscious factors in the motivational process, both in decision making and education, has increasingly been noticed. The effectiveness of commercial, non-commercial, and educational messages, as well as the structures of educational advertisements in neuromarketing, are discussed because the advertising audience has complex emotions. It is essential to determine the impact of motivational factors. In this regard, the present systematic review study was conducted to identify motivational factors related to the effectiveness of neuromarketing advertising.

Methods: In this systematic review study, English full-text articles published on Science Direct, Scopus, Google Scholar, and Emerald databases from 1990 to 2021 were searched with the keywords of "neuromarketing", "commercial and non-commercial messages", "ad effectiveness", "behavior", and "attitude". Afterward, the qualified articles were reviewed.

Results: Firstly, 900 articles were identified from different databases, of which 300 met the inclusion criteria. A total of 210 articles were deleted because they lacked experimental studies. Accordingly, 90 articles were selected for the final review. In total, 37 factors were identified related to the effectiveness of advertising in neuromarketing.

Conclusion: The two most influential factors in the research were attention and positive emotions. The greatest emphasis on the effectiveness of advertising is on attention-drawing stimuli and provoking positive emotions. Memory and negative emotions were identified as two other critical factors among the influencing factors.

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Highlights

- Using the tools in neuroscience to measure behavioral responses can lead to more valid results in psychology, such as behavior prediction and cognitive patterns
- Thirty-seven factors in neuromarketing advertisements were found which have essential roles in changing the consumers' attitudes and decisions, which were categorized in five main categories
- The results indicate that considering all the categorized factors can increase the impact of the ad on the attitude of the audience by creating arousal, activating brain processing, and recording in memory
- The most influential factors in the research were "drawing attention" such as innovation, unexpected images, and irregularity and "positive emotions" such as joy and pleasure

Plain Language Summary

Measuring the effectiveness of a social, educational or commercial advertisement has always been an important concern for experts in the fields of marketing management, psychology, sociology, as well as the media. The use of neuroscience tools in designing effective advertisements and measuring the impact of advertisement messages on people's attitudes has resulted in an interdisciplinary field called neuromarketing. In this research, using a systematic review among the articles in the field of neuromarketing, the factors in advertisements affecting the attitude of people and their decisions have been determined. 90 studies were reviewed and 37 factors affecting the decision and attitude of consumers were presented. The results show that applying these factors in the design of an advertisement can lead to an increase in the effectiveness of the health, education or commercial message of the advertisement.

1. Introduction

In recent years, theorists and researchers in marketing have made great efforts to understand and explain the nature of marketing, especially in advertising which is the most important component in the marketing mix. Theoretical and empirical studies have enhanced our understanding of the nature of marketing mixes, such as advertising (Kotler and Keller 2016). Billions of dollars are annually spent on advertising throughout the world. Such huge costs need to meet considerable efforts in measuring the effectiveness of advertising. Traditional methods, such as self-reports, for predicting the success of advertising largely depend on the audience's willingness and ability to describe the level of attention, feeling, preference, or future behaviors associated with the marketing campaign to which they have been exposed (Ghorbani, Ali Sara Sarahsari, 2017). Using the tools in neuroscience to measure behavioral responses can lead to more valid results in psychology, such as behavior prediction and cognitive patterns. A critical goal of psychology is to predict behavior and shape people's reactions. Simultaneously, people's behavioral tendencies can be identified through their likes or dislikes of

advertisements as environmental stimuli (Chandwaskar, 2018). In neuromarketing, as an interdisciplinary science, recognizing and predicting such behaviors and the ability to shape people's reactions can be achieved by manipulating the stimuli. Combining the tools of neuroscience with advertising as a recurring stimulus can help people better understand their emotions and needs. Applying self-reports to measure consumers' behavior, including questionnaires and face-to-face or telephone interviews, may lead to invalid results because of the limitations and biases that are inherent in conscious and unconscious processes. For example, unconscious processes occur subliminally and below the threshold of consciousness, and the conscious part of the human brain begins to function approximately 300 or 400 ms after the stimulus is presented; therefore, it cannot provide reliable verbal reporting while the human brain has already processed the data.

Nevertheless, these subconscious processes may significantly impact the audience's behavior. People sometimes experience vague feelings of being exposed to advertisements. However, they may not be able to retrieve the information quickly from their memory and express it verbally. Similarly, people's emotional experiences with advertising are complex and often in-

volve automated processes that are difficult to achieve in self-report (Li, 2019).

Because of the great interest of advertising experts in identifying the decision-making mechanism of the audience and understanding their internal intentions, theories and models used in research have dramatically changed in the past few years (Ghorbani, et al., 2017). Researchers and experts have been looking for innovative and mixed methods to study consumers' decision-making mechanisms to help increase the effectiveness of commercial and non-commercial advertising messages. Therefore, the use of neuroscience methods in marketing has recently become popular for they directly study the cortical activity at a certain time, place, and frequency (Wawrzyniak, 2016).

Although it is inaccessible for traditional marketing methods, such as self-report measures, there is progressively valid evidence proving that neuromarketing techniques can reveal the data showing that decisions are usually made based on emotions rather than rationality. Even logical decisions are impossible to make without emotional aspects (Ambler, Kokkinaki, & Puntoni, 2004).

Advertising is destined to achieve its social, educational, and commercial goals. Given the relatively high cost of content production and advertising, the presence of a large number of competitors, as well as the advertising bombardment, advertising agencies need to reach their target community optimally and effectively and have a favorable impact on consumers' attitudes and decisions following the commercial and non-commercial goals (Ghorbani, et al., 1400). This effect can only occur by creating both attractive and memorable ads. To achieve this goal, it is necessary to evaluate the ads carefully. However, very few studies have been done on the effectiveness of advertising and banner structures. In this regard, the present study was conducted to inspect various studies to identify factors related to the effectiveness of neuromarketing advertisements in a systematic review. The findings of this research can be practically generalized in motivating the teaching, accuracy, and better understanding of educational materials and the conscious and unconscious processing of textbooks or health messages.

2. Participants and Methods

This descriptive study systematically reviews the factors related to the effectiveness of neuromarketing advertisements. A systematic review is a structured search

performed according to predetermined rules and regulations. The statistical population of this systematic study includes all quantitative studies on the effectiveness of neuromarketing advertisements published in Science Direct, Scopus, Scholar Google, and Emerald databases. The search was done with a time limit of 1990 to 2021. The following keywords were searched in the title of the articles; "Advertising model", "Neuromarketing", "Advertisement effectiveness", and "Consumer decision". Because of no Persian articles in this field, only English articles published in international journals were considered. At each step, the searched articles in each database were entered into the Endnote software. A total of 900 articles were obtained using the mentioned keywords. The criteria for selecting articles in this study were the following two items: 1) published in reputable scientific databases in English; 2) related to the topics of the effectiveness of neuromarketing advertisements.

Review articles, qualitative studies, studies without discussion of neuromarketing, descriptive literature, and studies without measurement tools were excluded from the research process. Finally, 90 articles from 1990 to 2021 were included in the study. They were analyzed in detail, and their information was extracted and entered into the ready database. The process of searching and selecting articles is shown in Figure 1.

3. Results

At first, 900 articles were identified from various databases, of which 300 met the inclusion criteria. Among them, 210 articles were excluded from the study because they lacked experimental studies; at last, 90 articles were selected for the final review. All studies are summarized in Table 1. Most studies have focused on the effectiveness of advertising in the field of neuromarketing. The ads reviewed in these articles contained commercial, social, and educational messages. Evidence from the study showed that the 37 related factors to the effectiveness of neuromarketing could result in changing the attitude and affecting the consumers' decisions. The above-mentioned factors are listed in Table 1.

4. Discussion

In this study, we reviewed the articles that investigate the motivational factors of advertisements in the field of neuromarketing in a systematic review. All the studies in this review used tools in neuroscience such as electroencephalography, functional magnetic resonance imaging, electrodermal activity, and so on to detect the influential factors influencing consumers' decisions. The results

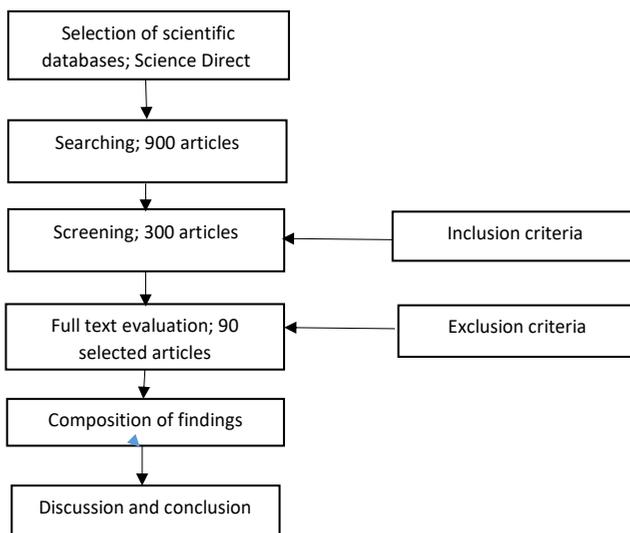


Figure 1. Research process

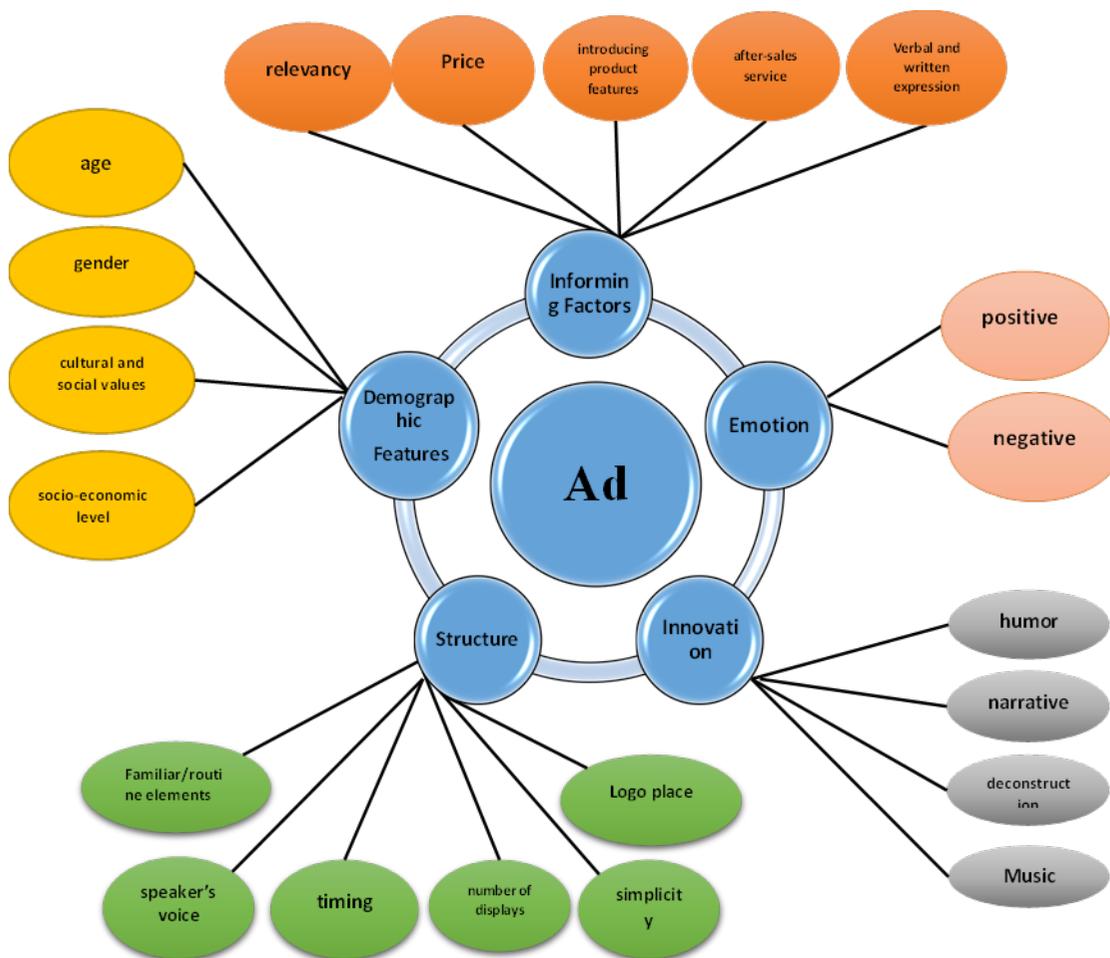


Figure 2. Proposed model of factors related to the effectiveness of neuromarketing advertising based on a systematic framework

Table 1. Factors extracted from articles related to the effectiveness of advertising in neuromarketing through systematic review

Row	Factors	Explanation	Sources
1	Cognitive and conscious information	The presence of conscious and cognitive factors in an advertisement that leads to recognizing risk and conflict in the decision-making process results in more effective advertising. Cognitive and conscious information plays a vital role in the effectiveness of the advertisement.	Jiang et al. (2020), Venkatraman et al. (2015), Vecchiato et al. (2012), Wawrzyniak, Wąsikowska (2016)
2	Social and cultural values	When exposed to an advertisement, consumers' purchase behaviors vary according to whether they are alone or in a group. Meeting social goals has a significant impact on the effectiveness of advertisements. For example, if people know that by buying or consuming what is being advertised, they can get more attention or belong to their favorite groups, they are more likely to respond positively to the advertisement and change their attitude or make the purchase. The individual makes a luxury purchase as long as at least one of their social goals is met. Social and cultural values have a positive effect on the effectiveness of advertisements.	Jiang et al. (2020), Zhang et al. (2019), Pozharlieve et al. (2017), Vecchiato et al. (2012), Kaklauskas et al. (2019)
3	Symbols of authenticity and background	The background of a product or a brand is perceived as a symbol of originality. Emphasis on symbols of authenticity and originality can increase the effectiveness of the advertisement.	Jiang et al. (2020)
4	After-sales service	Providing information related to after-sales service can affect the effectiveness of advertising. Emphasis on after-sales service has a positive effect on advertisement effectiveness.	Zhao et al. (2018)
5	Draw attention	Visual stimuli are the first sensory data that are very important in attention. The more involved an individual is with the product, the more attention they will pay. Scenes such as smiling and features, such as storytelling in an advertisement can draw attention. The use of elements that lead to attention has a positive effect on the effectiveness of the advertisement.	Zhou et al. (2018), Wawrzyniak, Wąsikowska (2016), Pilelienė, & Grigaliūnaitė (2016), , Ohme et al. (2010), Zubair et al. (2020), Venkatraman et al. (2015),, Shestyuk et al. (2019), Gordon et al. (2018), Bellman et al. (2017)
6	Simplicity	The analysis of the research results showed that the lowest level of complexity (simplicity) of the advertising design requires less processing as fewer items of information need scanning in short-term memory. In addition, the brands presented in ads with the lowest level of complexity are better remembered; also, the attitude towards them is more positive. Simplicity in the story design, the images, and the logo are essential factors in an advertisement's effectiveness.	Pileliene et al. (2016)
7	Simple scenario	Using simple scenarios compared to complex ones leads to higher accuracy and greater effectiveness in changing attitudes and purchasing decisions. A simple scenario can positively affect the effectiveness of an ad.	
8	Negative emotions	Sadness, anger, confusion, fear, and shock are considered negative emotions in ads. Studies have shown that negative emotions have a positive effect on the effectiveness of advertising.	Nomura & Mitsukura (2015), Kaklauskas et al. (2019), Cartocci et al. (2016), Alonso Dos Santos et al. (2017), Levriani et al. (2019), Zubair et al (2020),, Bettiga et al. (2020)
9	Desirability or pleasantness	The ads that are more popular with the consumers are better recalled. To the extent that an ad perceived desirable by the audience will draw more attention and focus while being watched and increases the likelihood of the effectiveness of the ad. Desirability or pleasantness has a positive effect on the effectiveness of the ad.	Zhou et al. (2018), Venkatraman et al. (2015), Vecchiato et al. (2012), Kaklauskas et al. (2019)

Row	Factors	Explanation	Sources
10	Memory	The power of remembering an ad is directly related to the desirability and arousal power of the ad. If an advertisement can be stuck in memory with more details and be recalled more quickly, it can have a more significant impact and a higher chance of changing the attitude of the audience. Memory has a positive effect on the effectiveness of the ad.	Zhou et al. (2018), Venkatraman et al. (2015), Vecchiato et al. (2012), Wawrzyniak, Wąsikowska (2016), Singh et al. (1989), Venkatraman et al. (2015), Gordon et al. (2018), Gonzalez-Morales (2020),
11	Unconscious decisions	In the human brain, the subconscious mind and cognitive decisions are active together in daily activities. Unfamiliarity with the brand stimulates unconscious decision-making processes. Studies have shown that advertisements with unconscious decision stimuli have a greater impact on the effectiveness of advertising.	Wawrzyniak, Wąsikowska (2016), Wawrzyniak, Wąsikowska (2016), Li (2019), Bettiga et al. (2020),
12	Cognitive decision making	Conscious decisions are mainly based on experience, investigation, reasoning, and risk assessment. An ad is more likely to change the attitude if it can lead to cognitive decision-making by preparing information, comparing, introducing risks and ways to reduce them, and sharing experiences. Studies have shown that using stimuli that lead to cognitive decision-making positively affects the effectiveness of advertising.	Wawrzyniak, Wąsikowska (2016), Wawrzyniak, Wąsikowska (2016), Li (2019), Martinez Fiestas et al. (2015), Pilelienė, & Grigaliūnaitė (2016), Bettiga et al. (2020)
13	Shock	Shock increases the ability to remember an advertising campaign. The better and more detailed an ad is remembered, the more likely it is to be effective. Shock increases the effectiveness of the ad.	
14	Familiar & routine elements	Using familiar and common elements in everyday life creates a better connection between the ad and the audience's daily life. This factor also increases the attention of the audience. Using familiar and routine elements in many cases can lead to the effectiveness of the ad.	Venkatraman et al. (2015), Ozkara & Bagozzi (2021), Wawrzyniak, Wąsikowska (2016), Erdemir (2015)
15	Age	Individual differences in age can play an essential role in the audience's interpretation of a brand. Matching the content of the ad with the age of the target audience increases the effectiveness and influence of the ad. Considering the age factor and its relevance to the target group has a positive effect on the effectiveness of the ad.	Randolph & Pierquet (2015), Guixeres et al. (2017), Kaklauskas et al. (2019), Cartocci et al. (2016),
16	Gender	Individual gender differences can play an important role in the audience's interpretation of a brand. Matching the content of the ad with the gender of the target audience increases the effectiveness and influence of the ad. Considering the gender factor and its relevance to the target group has a positive effect on the effectiveness of the ad.	Randolph & Pierquet (2015), Guixeres et al. (2017), Kaklauskas et al. (2019), Cartocci et al. (2016), Mateusz (2018),
17	Socio-economic level	Individual differences in socio-economic level can play an important role in the audience's interpretation of a brand. Matching the content of the ad with the socio-economic level of the target audience increases the effectiveness and influence of the ad. Considering the socio-economic level factor and its relevance to the target group has a positive effect on the effectiveness of the ad.	Randolph & Pierquet (2015), Guixeres et al. (2017)
18	Narration	A narrative structure in the advertisement causes higher theta waves' power in the left forehead. Having a story or narrative form affects the audience's preference. Verbal narratives affect the audience's emotions. Studies have shown that having a structure based on storytelling increases the positive effects of the ad.	Cartocci et al. (2016), Wang et al. (2016), Royo et al. (2018), Gordon et al. (2018),
19	Positive valence or positive emotions	Being positively emotional creates high effectiveness, especially in social advertisements. Positive emotions such as joy, interest, and pleasure result in deeper effects. Positive valence or emotions efficaciously impacts the effectiveness of the ad.	Cartocci et al. (2016), Kaklauskas et al. (2019), Wawrzyniak, Wąsikowska (2016), Shestyuk et al. (2019), Royo et al. (2018), Gordon et al. (2018), Yang et al. (2015), Li (2019), Gonzalez_Morales (2020), Mateusz (2018) Zubair et al. (2020), Bettiga et al. (2020),

Row	Factors	Explanation	Sources
20	Product engagement	Studies regarding the use of eye tracking techniques have shown that the higher the mental engagement with the product, the more attention will be paid to the product and the information provided. In other words, the more the product or message presented in the ad fits the needs of the audience, the more likely it is to attract attention and subsequently record in memory and change attitudes. Product engagement has a positive effect on ad effectiveness.	Wawrzyniak, Wąsikowska (2016)
21	Excitement	A higher level of excitement makes the audience remember the ad better. The use of emotional stimuli and excitement leads to greater effectiveness of advertising.	Venkatraman et al. (2015) Kaklauskas et al. (2019)
22	Content and message relevancy	In particular, a successful ad should try to draw attention and activate emotional responses, working memory, and imagination. The relevancy between the story object and the audience effectively attracts attention and emotional stimulation. Choosing content that fits the message of the ad positively affects the effectiveness of the ad.	Venkatraman et al. (2015) Krishna (2012) Gordon et al. (2018) Erdemir (2015)
23	Innovation	Innovation is defined as the use of elements that break the usual structure of an ad. In addition, innovative methods in presenting the ad cause more recall and draws attention. Applying innovation in the structure and presentation of an ad has a positive effect on the effectiveness of the ad.	Zhou et al. (2018) , Venkatraman et al. (2015) Cartocci et al. (2016)
24	Arousal	Arousal is a sign of the effect on the attitude of the audience. For instance, more enjoyable and memorable advertisements cause more arousal. The extent to which an ad can make arousal is related to the effectiveness of the ad.	Ohme (2010) , Vecchiato et al. (2012) Singh et al. (1989) Kaklauskas et al. (2019) Venkatraman et al. (2015) Li (2019) Erdemir (2015) Bettiga et al. (2020)
25	Unpredictability	Placing an irrelevant and unexpected image or element makes it possible to draw and maintain more attention. Attracting and retaining attention by increasing the probability of recording in memory causes attitude change. Studies have shown that unpredictability has a positive effect on the effectiveness of the ad.	Ohme (2010) , Alden et al. (2000) Kaklauskas et al. (2019) Bellman et al. (2017) Mostafa (2020)
26	Humor	Funny features in the design, sound, and content of an ad are considered a factor of humor. Factors such as irrelevance, imitation, impersonation, anomaly, unreasonable repetitions, and funny appearances, which are considered deconstructive factors of humor, affect drawing attention and recording in memory; thus, they play an important role in influencing advertising to the audience. Studies have shown that humor is one of the effective factors in advertising.	Alden et al. (2000) Bellman et al. (2017) Erdemir (2015)
27	Brand or product display repetition	The higher number of times the product or the brand name is displayed or mentioned in an advertisement which leads to memory recording, can change consumers' attitudes and affect their preferences. Studies have shown that the number of displays of a product or a brand is associated with the effectiveness of the ad.	Wang et al. (2016) Kaklauskas et al. (2019)
28	The place of the logo	Placing the logo or the product name in the middle of the page will attract more attention. Studies have shown that ads in which the logo is located in the center of the screen attract more attention and have a positive impression on the effectiveness of the ad.	Wawrzyniak, Wąsikowska (2016) Erdemir (2015)
29	Timing	Advertisements less than 45 seconds are more effective because of the positive effect on attention drawing and processing. Therefore, the timing of the ad, preferably less than 45 seconds, has a positive effect on the effectiveness of the ad.	Wawrzyniak, Wąsikowska (2016) Wolf, & Donato (2019) , Erdemir (2015)
30	Fear	Imposing fear by creating scary or unexpected scenes as well as using scary music can have an impact on memory and make the ad more memorable. Fear, as one of the factors of negative emotions, increases the recall of the ad and thus affects the effectiveness of the ad.	Mostafa (2020)
31	Surrealistic images	Compared to other types of advertising, surrealistic images activate more areas of the brain, including the parietal cortex, precuneus, frontal cortex, and lower amygdala. This result shows that compared to other types of advertising, surrealistic advertising is processed in different functional pathways of the brain. Inconsistent and deconstructive stimuli, of which surrealistic images are the most popular, increase brain processing and a higher probability of recording in memory, thereby changing the attitude of the audience. Surrealistic images can be used as a factor in the effectiveness of advertising.	Mostafa (2020)

Row	Factors	Explanation	Sources
32	Use of text	Having a text makes the ad more effective. Using text in the structure of an ad leads to more impact.	
33	Price	Announcing the price of a product in advertising and using the price factor as a competitive advantage can affect the perception of that product or brand. For example, luxury goods or services are expected to have a relatively high price; therefore, announcing a high price for a service or product in an advertisement causes the audience to perceive that the service or the product is of superior quality. On the other hand, price causes consumers to engage mentally.	Jiang et al. (2020)
34	Speaker's voice	The tone, the pitch, and the volume of the speaker's voice are essential factors in the advertisement's effectiveness. In general, the low-pitched sounds are more popular, and the listener has more authority and credibility for speaking faster. Studies have shown that the voice and the speaking speed of the speaker affect the effectiveness of the ad.	Krishna (2012), Pilelienė & Grigaliūnaitė (2016) Mostafa (2018)
35	Audio symbols	If eating or drinking a particular food has a distinct sound, it can affect the perception of the taste or freshness and quality of certain foods. Relevancy of the sound with the image like a higher-pitch sound for men or a gentle door closing sound for luxury cars. The more the sound symbol of a brand is in line with the brand and the type of product, the more positive the evaluation of the brand will be.	Krishna (2012)
36	Music	The use of music in ads can increase the persuasiveness of the ad by affecting the moods and emotions of the audience. Music has a positive effect on the effectiveness of the ad.	Krishna (2012) Martinez Fiestas et al. (2015)
37	Background music	Using music in the background makes the audience not feel the boredom and lengthiness of the ad. The use of background music has a positive effect on the effectiveness of the ad.	Krishna (2012) Levrini et al. (2019)

showed that 37 factors in neuromarketing advertisements have essential roles in changing the consumers' attitudes and decisions; namely, cognitive and conscious information, social and cultural values, symbols of authenticity and background, after-sales service, draw attention, simplicity, simple scenario, negative emotions, desirability or pleasantness, memory, unconscious decisions, cognitive decision making, shock, familiar and routine elements, age, gender, socio-economic level, narration, positive valence or positive emotions, product engagement, excitement, content and message relevancy, innovation, arousal, unpredictability, humor, brand or product display repetition, the place of the logo, timing, fear, surrealistic images, use of text, price, the voice of the speaker, audio symbols, music, and background music. The results indicate that considering all the factors in designing an advertisement can increase the impact of the ad on the attitude of the audience. Using these factors by creating arousal, activating brain processing, and recording in memory can lead to desirable changes in the consumers' attitude toward the brand, the product, health-social messages, or the educational content.

According to the results, the most influential factors in the research were "drawing attention" and "positive emotions", with 13 cases. Accordingly, the most emphasis on an advertisement's effectiveness is on the

stimuli that activate attention and positive emotions. Therefore, embedding stimuli related to attention draw (innovative ad presenting, placing an irrelevant and unexpected image or element, humorous factors such as irrelevance, imitation, irregularity, unreasonable repetitions, and funny appearances) and stimuli of positive emotions (joy, interest, and pleasure) can enhance the effectiveness of the advertisement.

Based on the results, memory was an influential factor in research with 11 cases. Therefore, it can be pointed out that the more desirable the advertisement is perceived, the more likely it is to be recalled. More excitement and arousal in the ads result in better recall. The results show that negative emotions, including sadness, anger, confusion, fear, and shock, were effective factors in 9 cases, which implies that negative emotions can also be stimulated for the effectiveness of advertising.

Subsequently, the following model can be derived from the components obtained from the systematic review in the form of main and sub-components and presented in the following proposed model. In this model, the components of positive and negative emotions are in the main category of emotions. Verbal and written expression, after-sales service, product features, price, and relevancy are in the main category of informing factors. Factors such as age, gender, cultural and social

values, and socio-economic level fall into the main category of demographic features. Logo place, familiar and routine elements, speaker's voice, timing, number of displays, and simplicity fall into the category of ad structure. Music, humor, narrative, and deconstruction fall into innovation category.

Limitations and suggestions

Considering that neuromarketing is an emerging and interdisciplinary science, the number of articles in the field on the effectiveness of neuromarketing advertisements is very small. On the other hand, each research about determining the effect of commercial and non-commercial advertisements has examined the limited factors separately each time. No research was available in the form of measuring the effectiveness of advertising or as a review that comprehensively summarizes the factors affecting the change of attitude because of advertising.

Also, there was no research providing an effective advertising model. The factors mentioned in this study have each been measured in a separate study using the tools in neuroscience. Some studies have only used neuromarketing tools to measure effectiveness, while more reliable results can be obtained if a combination of traditional measures, self-report, and consumer neuroscience tools are used. In addition to summarizing the factors influencing the design of an effective advertisement, the present study has provided a comprehensive model for advertising in neuromarketing. The derived model, the combination and integration of components from the review study, can be used as a conceptual research model in designing and measuring the effectiveness of commercial and non-commercial advertisements (medical, social, and educational). Therefore, it is suggested that the model's components be measured, improved, and developed using electroencephalogram and electrodermal activity measurements. In this way, the lack of an effective advertising model for consumers' decisions will be filled.

It can also be acknowledged that the model mentioned above can be evaluated by structural equation modeling and the Delphi method to validate the components with the opinion of experts and specialists. It is also possible to level the components by interpretive structural modeling. In this regard, with the DEMATEL method, the effect of the components can also be identified. It is also suggested that the proposed model be evaluated in a separate study, specifically in motivational advertisements for teaching, accuracy, and a better understanding

of educational materials and conscious and unconscious processing of the courses or health messages.

5. Conclusion

In this study, we tried to demonstrate that neuromarketing studies have a better and more accurate estimation of essential factors in advertising which affect people's attitudes and decision-making. Since one of the essential concerns in psychology is to recognize, predict, and shape behaviors as well as to help people to know the factors, especially the unconscious factors, that influence their decision-making, it is critical to use valid and reliable methods, which is the combination of traditional self-report measures and tools in neuroscience.

The results show that the most influential factors in the research were "drawing attention" and "positive emotions". "Memory" and "negative emotions" were other influential factors. Accordingly, to create a compelling message to be broadcasted through an advertisement, the most emphasis needs to be on the stimuli that activate "attention" and "positive emotions". Therefore, designing stimuli related to attention draw (such as innovation, placing an irrelevant or unexpected image, humorous factors, and funny appearances) and stimuli of positive emotions (joy, interest, and pleasure) would result in the advertisement's effectiveness. Applying desirable and exciting elements can stimulate people's memory to recall the message more easily. Embedding images and scenes associated with "negative emotions" (including sadness, anger, confusion, fear, and shock) can also make the message very effective.

The research findings are practical in creating educational materials considering the factors of the proposed model to make the most impression, better recalling lessons, and enhancing motivation in students and teachers. In addition, considering the factors mentioned above when designing ads conveying health or social messages would influence people's attitudes and decisions toward more favorable ones.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this research.

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Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

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