

Research Article

<https://doi.org/10.32038/mbrq.2023.26.03>

The Role of Famous Athlete Endorsement in Consumers' Attention to Sports Products: Alpha and Beta Brain Waves

Ali Ghaedi¹, Behzad Izadi*² 

¹ Assistant Professor, Department of Physical Education, Faculty of Management, Imam Ali University, Tehran, Iran

² Associate Professor, Department of Physical Education, Faculty of Humanities, University of Kurdistan, Sanandaj, Iran

KEYWORDS

Endorsement, Advertising, Neuro marketing, Alpha and Beta Waves, Sport Products, ISO 9001:2015

Correspondence:
b.izadi@uok.ac.ir

ABSTRACT

Neuromarketing techniques have expanded significantly in recent years. Therefore, in the present research, the role of endorsement strategy on the consumers' attention to sports products is investigated by examining alpha and beta brain waves. The research method was done experimentally. The statistical population consisted of 20 males and females in the age range of 25 to 35 years. Images according to the endorsement strategy used with Enobio, a 20-channel electroencephalography device to record waves and measure attention. Frontal (F3, F4, FZ), central (C3, C4, CZ), temporal (T7, T8), occipital (O1, O2) and parietal (PZ) brain regions examined. In order to extract waves from quantitative electroencephalography data, Matlab 2013 b software was used. Mann-Whitney U test used to analyze the data using SPSS 22 software. The results showed that there is a significant difference between alpha and beta waves between two groups, without endorsement and with endorsement images, so the endorsement strategy reduces the amount of alpha waves and increases the amount of beta waves in different areas of the brain. Endorsement can attract the attention of the consumer significantly. It can be employed as an effective method to attract the attention of consumers and promote them to purchase sports product.

Introduction

In today's competitive marketplace, if a company wants to quickly introduce a service or product to consumers so that they can remember it, it must focus on advertising campaigns. In fact, companies need to use different marketing methods to compete globally and survive. One of the ways to succeed in this field is to plan appropriate promotional activities and establish effective

Received 17 April 2023; Received in revised form 8 June 2023; Accepted 19 June 2023

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communication with customers. One of the most commonly used methods in marketing promotion activities is endorsement by celebrities. Endorsement by celebrities as part of marketing communications (Crutchfield, 2010) is a global practice in advertising campaigns (Pradhan, Kapoor, & Moharana, 2017). After examining the perfect match between celebrities, product, and messages, companies select some celebrities as their endorsers (Maharani, Helmi, Mulyana, & Hasan, 2020; Oh & Park, 2020).

Celebrities influence culture and the general public through film, television, sports, music, and social media (Schimmelpfennig & Hunt, 2020) and promote a wide range of products such as food, cosmetics, carbonated beverages, clothing, and sports brands (Englund, Zhou, Hedrick, & Kraak, 2020). In fact, they use their knowledge and popularity to appear alongside advertising products and brands and receive huge costs in return (Ferguson & Mohan, 2020). These costs can be attributed to the benefits of celebrities, including the ability to create and attract attention, the ability to improve the brand image, help upgrade the product, support transform the brand position, and keep enormous campaigns (Spry, Pappu, & Cornwell, 2011).

Endorsement is one of the methods to emphasize brands and products in a competitive marketing environment; because celebrities can recreate a critical role in convincing and attitudes towards a particular advertisement and the efficacy of advertisement in general (Agnihotri & Bhattacharya, 2018; Park, 2017). This strategy is one of the sources of revenue for athletes (Kim, Lee, Jang, & Ko, 2021) and one of the most influential brand marketing tools (Spry et al., 2011), because the positive characteristics of certifiers can be transferred to brands (Baniya, 2017). The more credible and famous the validator is, the greater the impact of endorsement (Seno & Lukas, 2007).

However, there are more advantages to being endorsed by celebrities, such as; Capability to attract attention to advertising (Felix & Borges, 2014), favorable effect on financial performance (Ding, 2011), brand reminder (Van der Waladt, Van Loggerenberg, & Wehmeyer, 2009), draw consumer attention and motivate purchasing decisions (Chan & Fan, 2022). But it must be noticed that endorsement can be like a double-edged blade (NGUYEN, 2021), and in addition to the positives, there are too possible opposites associated with famous celebrities, such as overshadowing a brand or campaign, the possibility of public controversy, financial costs, and brand or product inconsistency (Bartz, Molchanov, & Stork, 2013).

Due to the multiple advantages noted for endorsement by celebrities, many studies have been done in this area. Spry et al. (2011) stated that celebrity endorsements can positively affect consumer attitudes toward advertisements, and it is likely that adding a celebrity endorser in an ad will draw attention to the ad and lead to a better outcome. Baack, Wilson, van Dessel, and Patti (2016) argue that creativity draws attention to advertisements and makes the message content more descriptive, which can lead to more favorable attitudes and higher levels of purchase intention. NGUYEN (2021) demonstrated that physical attractiveness, popularity, compatibility, expertise, credibility, and multiple endorsements of celebrities have significant effects on buying intention. Lazar and Pop (2021) indicated that consumers pay more attention to fake news headlines and celebrity images and slightly to actual product-related data.

Celebrities are used in advertising to draw more attention and attract the audience to the product or advertisement because when celebrities talk about any product in advertisements, they

attract more people's attention compared to an ordinary person (Abbas, Afshan, Aslam, & Ewaz, 2018). Actually, when designing advertisements, such as celebrity endorsements, attracting the audience's attention and interest is the main goal. (Deval, 2010). This idea recalls the theoretical models of information processing, the first of which is the AIDA model (attention, interest, desire, action), and further models are usually named "hierarchy-of-effects" models (Ferguson & Mohan, 2020). These models stress attention as the first phase of advertising (Wedel & Pieters, 2017). But it should be noted that people's ability to process information is limited (Kardes, Cline, & Cronley, 2011). This limitation can have several reasons, including lack of opportunity, motivation and abundance of marketing stimuli. Thus, the primary priority in advertising strategy is to design advertisements that will attract the visual attention of the customer. (Wedel & Pieters, 2000).

Although there has been a large number of study on celebrity endorsement such as (Chan & Fan, 2022; Lazar & Pop, 2021; Rachmat, Hurriyati, & Sultan, 2019; von Felbert & Breuer, 2020), these studies have been more traditional. By the way, studies related to marketing and consumer behavior note that more than 90% of information is processed unconsciously in the human brain (Agarwal & Dutta, 2015). As mentioned in many researches, traditional methods cannot understand the unconscious nature of consumer behavior well (Izadi, Ghaedi, & Ghasemian, 2021). In fact, in this research, people openly and consciously report their experiences and ideas, so it is not possible to evaluate the unconscious aspects of consumer behavior by using such methods. These methods are mostly done in the form of attitude measurement, and this is despite the fact that attitude does not always lead to behavior. Also, according to the traditional data collection methods such as surveys, interviews and questionnaires, there can be bias in the results of this research. Therefore, it is necessary to use methods that can be used to examine the consumer's unconsciousness and obtain pure and non-biased information and examine the consumer's behavior in the face of marketing stimuli so that the methods and strategies could adequately be adopted. Using neuromarketing methods or examining consumers' brainwaves would be an adequate method. It has been stated in many researches that these methods can provide important information in order to understand consumer behavior (Agarwal & Dutta, 2015; Falk, Berkman, & Lieberman, 2012; Izadi et al., 2021). Therefore, the purpose of this research was to investigate the effect of endorsement of famous athletes on consumers' attention by analyzing alpha and beta brain waves while using neuromarketing and electroencephalography tools. In this way, it is possible to determine the effect of this strategy on the unconsciousness of consumers along with providing appropriate information for the use of marketers in line with the better effectiveness of their promotional strategies.

Literature review

Neuromarketing

In neuromarketing, the market and consumer behavior are studied using a mixture of consumer psychology and neuroscience (Chark, 2018). Regarding that consumer neuroscience studies the unconscious activities and actual preferences of consumers more attentively than traditional research (Aldayel, Ykhlef, & Al-Nafjan, 2020), The usage of neuromarketing techniques has increased significantly in recent years, and this growth has been demonstrated in many studies

(Niemczyk, 2016; Royo-Vela & Varga, 2022; Szymczak, 2016). In fact, these techniques are employed to reach marketing goals (Alvino, Constantinides, & Franco, 2018). By using this methods , it is achievable to investigate the neural mechanisms and cognitive processes of humans, and by examining and processing marketing stimuli, we can analyze behavior (Alvino et al., 2018; Fortunato, Giraldi, & de Oliveira, 2014) and the consumer's decision making (Lee, Broderick, & Chamberlain, 2007; Sung & Phau, 2018) when faced with marketing stimuli. Thus, the usage of consumer neuroscience techniques can be more effective than traditional techniques. So this method was also used in the present research.

Electroencephalography (EEG)

One of the tools used in consumer neuroscience research is electroencephalography. Using electroencephalography, we can analyze well the brain activities of consumers, which are usually undetectable (Oon, Saidatul, & Ibrahim, 2018). In the electroencephalography technique, electrophysiological signals generated by brain activity are measured (Zhang, Lei, Wu, & Jiang, 2014). The resolution of these signals is high (Abhang, Gawali, & Mehrotra, 2016) and brain activities can be registered well at the time of their formation (Cohen, 2014). Regarding the rapidity of brain cognitive functions and their happening in tens or hundreds of milliseconds (Freeman & Quiroga, 2012), EEG can be a convenient tool to register these fast and dynamic cognitive processes (Cohen, 2014). Furthermore, due to its cheapness, the use of the EEG technique has attracted the attention of researchers (Lin, Cross, Jones, & Childers, 2018). The EEG signals of the human brain are classified into five main frequency bands. They are delta (0.5-4 Hz), theta (4-8 Hz), alpha (8-13 Hz), beta (13-30 Hz), and gamma (more than 30) (Abd Rahman, Othman, & Shaharuddin, 2015). These signals with various frequencies denote the changes in the general state of the brain (Engel & Fries, 2010). By using them, it is possible to examine specific brain functions such as attention, arousal, etc. in the face of marketing stimuli. The alpha wave appears when the person's eyes are closed and in a relaxed state (Siuly, Li, & Zhang, 2016). This domain is a bridge wave between conscious thinking and non-conscious thinking. If we get stressed, we block alpha waves. A higher than usual amount of alpha waves causes daydreaming, inability to concentrate, excessive relaxation, and a lower than usual amount causes anxiety, high stress, obsession, insomnia. The presence of these waves when a person is awake and in a relaxed state leads to a slow response to stimuli (Tiago-Costa, Quelhas-Costa, & Santos-Baptista, 2016). In a variety of consumer neuroscience studies, a decrease in the amount of alpha waves has been associated with an increase in alertness and sensory attention (Frey, Ruhnau, & Weisz, 2015; Palva & Palva, 2007; Thut, Nietzel, Brandt, & Pascual-Leone, 2006). There are several evidences in line with the effect of alpha wave oscillations on the level of people's attention to a stimulus, which is the goal of the present research (Foxye & Snyder, 2011). Research has shown that alpha wave neural oscillations (8-13) are associated with the amount of voluntarily allocated attention of individuals (Harris, Ciorciari, & Gountas, 2018). An increase in high alpha waves is associated with deactivation of the brain. (Alarcao & Fonseca, 2017). Cortical activation, which is associated with a decrease in the frequency spectrum of the alpha wave, is directly related to the level of arousal (Simons, Detenber, Cuthbert, Schwartz, & Reiss, 2003). Therefore, by increasing the activation of the cerebral cortex and increasing the level of attention,

the amount of alpha wave decreases, and by decreasing the activation of the cerebral cortex and decreasing the level of attention and alertness, the alpha wave increases.

When the brain is stimulated and engaged in mental activities, it produces beta waves. These waves are the characteristics of a highly involved mind. Beta is a brain wave that is usually associated with active activities, active attention, arousal and focusing on the outside world or solving objective problems (Siuly et al., 2016). Beta is mainly seen in the frontal lobe and central regions when a person is awake and processing information (Yuval-Greenberg, Tomer, Keren, Nelken, & Deouell, 2008). The presence of this wave is associated with a state of arousal, alertness and attention (Tiago-Costa et al., 2016). Therefore, according to the characteristics of alpha and beta waves, when the consumer is exposed to marketing stimuli and increases his attention and arousal, the amount of alpha wave in the consumer's brain decreases and the amount of beta wave increases, and vice versa.

Sharma and Singh (2015) showed in their research that the average alpha power while doing a task and increased attention compared to the moderate power of this wave in the state of relaxation decreased in the frontal (electrodes F3 and F4) and back of the brain (electrodes O1 and O2). But no statistically important differences were found in alpha power in the prefrontal region (Fp1 and Fp2) of the brain during the tasks. Wróbel (2000) showed in his research that the amount of alpha wave increased when visual attention increased. Andreassi and Filipovic (2001) stated that the amount of beta wave increased both during physical activity and during mental activity. Barry, Clarke, and Johnstone (2003) reported that increased skin conductance levels (increased arousal and attention) were associated with decreased alpha wave amplitude in children during an eyes-closed resting state. Yaomanee, Pan-ngum, and Ayuthaya (2012) showed in their research that the alpha wave in the relaxation state was higher than the alpha wave in the attention state and the beta wave in the attention state was higher than the beta wave in the relaxation state.

Research hypotheses

Marketing stimuli lead to the creation of organismic responses in consumers (Donavan & Rossiter, 1982). Organismic responses act through the emotional states of consumers in the three dimensions of emotional stimulation, pleasure and mastery (Donavan & Rossiter, 1982; Lam, 2001) and cognitive perceptions such as attention (Lam, 2001). Attention is referred to as one of the key elements in choosing and deciding to buy a product (Guerreiro, Rita, & Trigueiros, 2015). Attention is a cognitive process in which the mind focuses on certain stimuli or stimuli from the environment. And other environmental stimuli are ignored (Lam, 2001). Also, based on information processing models, including the AIDA model, when designing advertisements, such as endorsements by celebrities, the interest of the audience, attention is known as the first step in designing an effective promotional method. Therefore, since the alpha wave is associated with a person's state of relaxation and inattention, and on the contrary, the beta wave is associated with a state of tension, attention and alertness, these two waves can be used as a suitable criterion for measuring a person's attention. Therefore, in the current study, the role of endorsement strategy on consumer attention was investigated by examining alpha and beta brain waves, and the following hypotheses were formulated:

The endorsement strategy has a significant effect on the alpha wave (attention) in the frontal, central, occipital, and cranial regions of the brain.

The endorsement strategy has a significant effect on the beta wave (attention) in the frontal, central, occipital, and cranial regions of the brain.

Methodology

Research population and sample

The research sample was twenty volunteers (10 men and 10 women) of physical education students were randomly selected. All the samples were conscious of how to experiment and participated in the research with satisfaction. For this purpose, knowingly, they signed a consent form to participate in the research. In order to prevent disturbance in the results, was checked that the samples were free of any diseases and also were prepared instructions to research samples so that the samples considered having sufficient rest, not drinking caffeine, etc. on the day before participating in the research. Table 1 shows the demographic information of the subjects.

Table 1.

Characteristics of samples

	percent			percent	
Sex	Female	50	Education	Master	65
	Male	50		Ph.D Student	35
Age	25 to 30	60			
	30 to 35	40			

Research tools

In order to prepare research tools, 20 sports products that were highly used in the research population and 20 famous and popular sports experts were selected and distributed between 400 people from the statistical population. The most used sports products due to the statistical population of the research (five products) and the most popular athletes (five athletes) were chosen. Then, the suitable images were ready in two parts with strategy and without strategy, and the validity of the images was confirmed by 10 sports marketing expert. Since the endorsement is the approval of a brand, in order to prevent the influence of the brand on the research samples, the name of an unreal brand was chosen. 10 images were ready for each part. The images were shown to the samples in the form of a PowerPoint file and each image lasted for 5 seconds and during two stages of repetition and a total of 100 seconds for each stage of the research. The Sports products and sports endorsement among male and female participants are shown in the Table 2.

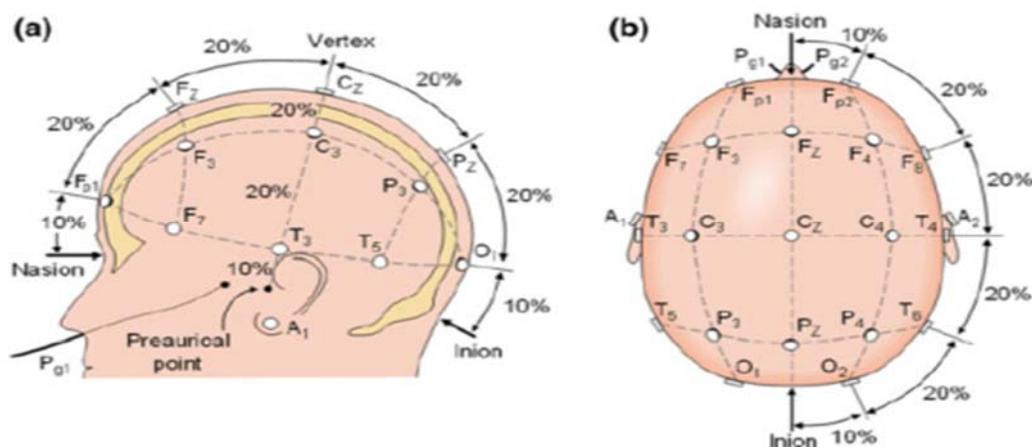
Table 2.
Sports products and sports endorsement

Sports products	Sports endorser	
	Male	Female
T-Shirt	Ali Daei	Ali Daei
Warm-Up Suit	Sardar Azmoun	Sardar Azmoun
Swimsuit	Mehdi Mahdavia	Ali Karimi
Sneakers	Alireza Jahanbakhsh	Kimia Alizadeh
Bag	Ali Karimi	Alireza Jahanbakhsh

Electroencephalography

In order to measure brain waves, the Enobio electroencephalography device, 20 channels made in Spain, was used. The channels of this device are set according to the international 10-20 system. The brain waves of the research samples were recorded when exposed to marketing stimuli. The frontal (F3, F4, FZ), central (C3, C4, CZ), temporal (T7, T8), occipital (O1, O2) and parietal (PZ) brain regions were examined.

Figure 1.
Enobio 20-channel electroencephalography device



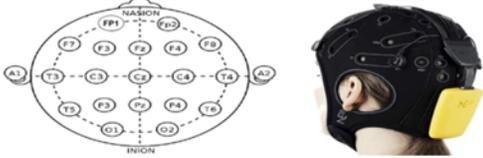
Procedure

The experiment was conducted during weekdays (10-12 a.m.) and afternoon (2-6 p.m.). After reading and setting the informed consent, the participants were settled in a soundproof room. This room was lit only by artificial lamps. Therefore, the lighting was constant and the same for all participants in the experiment. Participants were placed in front of a table with a computer monitor on it. After describing the test protocol and setting the Enobio 20-channel electroencephalography tool on the participants' heads, the researchers of the test protocol were based outside the room. First, participants are shown pictures without strategy and their brain waves are recorded. Then, by playing a soft music and resting for 10 minutes, the images along with the validation strategy are shown to them and their brain waves are recorded. In both stages of research (without strategy and with strategy), the images were completely similar and identical. After extracting data from brain waves and converting them into quantitative numbers, using EDF

browser and MATLAB 2013 b software, it was used to check the difference between brain waves obtained from Mann-Whitney U which is shown in the Table 3.

Table 3.

Steps of the research implementation method

A		Preparation and installation of EEG device by observing research controls
B		Showing images without strategy and recording brain waves for 100 seconds
C		Play soft music and rest for 10 minutes
D		Showing images with strategy and recording brain waves in 100 seconds

Research findings

Mann–Whitney U test was used to check the significance of alpha wave in different brain regions in two cases without endorsement strategy and with endorsement strategy. According to the results, the amount of alpha wave is significant in all areas of the head in the two investigated cases. Table 4 shows the results of U test of Alpha waves.

Table 4.

The results of the Mann–Whitney U test of Alpha waves in different areas of the brain

Region	Strategy	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Sig
Central	With Endorsement	20	21	431	179	0.001*
	Without Endorsement	20	19	389		
Frontal	With Endorsement	20	21	427	183	0.001*
	Without Endorsement	20	19	393		
Occipital	With Endorsement	20	23	465	145	0.001*
	Without Endorsement	20	17	355		
Temporal	With Endorsement	20	19	383	173	0.001*
	Without Endorsement	20	21	437		
Parietal	With Endorsement	20	21	428	182	0.001*
	Without Endorsement	20	19	392		

According to the results of Table 5, the average alpha wave in different channels and areas of the head, in the central region, the amount of alpha wave was 21 in the state without the

endorsement strategy and 19 in the state with the endorsement strategy. In the frontal region in both cases, 17 and no change were reported. The amount of alpha wave in the occipital region was 20 without change in both modes, and in the temporal state without the endorsement strategy, it was 13 and in the state with the endorsement strategy was 12.02. The amount of alpha wave in the regional region was 27 without endorsement strategy and 20 with endorsement strategy. The results have been shown in the Table 5.

Table 5.*Descriptive statistics of Alpha wave*

Region	channel	Strategy	Mean	Std. Deviation
Central	C3, C4, CZ	With Endorsement	19	10
		Without Endorsement	21	15
Frontal	F3, F4, FZ	With Endorsement	17	6.02
		Without Endorsement	17	9
Occipital	O1, O2	With Endorsement	20	9
		Without Endorsement	20	19
Temporal	T7, T8	With Endorsement	12.02	5
		Without Endorsement	13	8.08
Parietal	PZ	With Endorsement	20	9
		Without Endorsement	27	28

Mann–Whitney U test was used to check the significance of alpha wave in different brain regions in two cases without endorsement strategy and with endorsement strategy. According to the results, the amount of alpha wave is significant in all areas of the head in the two investigated conditions as shown in the Table 6.

Table 6.*Mann–Whitney U test results of beta wave in different brain regions*

Region	Strategy	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Sig
central	With Endorsement	20	20	409	199	0.001*
	Without Endorsement	20	20	411		
frontal	With Endorsement	20	21	429	181	0.001*
	Without Endorsement	20	19	391		
occipital	With Endorsement	20	23	466	144	0.001*
	Without Endorsement	20	17	354		
temporal	With Endorsement	20	20	405	195	0.001*
	Without Endorsement	20	20	415		
parietal	With Endorsement	20	20	419	191	0.001*
	Without Endorsement	20	20.05	401		

According to the results of Table 7, the average beta wave in the channels and different areas of the head, in the central and frontal region, the amount of beta wave in the state without the endorsement strategy was 5 and in the state with the endorsement strategy was 6. The average beta wave in the occipital region in the state without the endorsement strategy was 5 and in the

state with the endorsement strategy was 7 and in the temporal state in the state without the endorsement strategy was 6 and in the state with the endorsement strategy was 5. In the regional area, it was 6 and unchanged in both modes. The results of descriptive statistics of Beta wave are shown in the Table 7.

Table 7.

Descriptive statistics of Beta wave

Region	Channel	Strategy	Mean	Std. Deviation
Central	C3, C4, CZ	With Endorsement	6	2
		Without Endorsement	5	1
Frontal	F3, F4, FZ	With Endorsement	6	2
		Without Endorsement	5	2
Occipital	O1, O2	With Endorsement	7	4.06
		Without Endorsement	5	2
Temporal	T7, T8	With Endorsement	5	2
		Without Endorsement	6	3
Parietal	PZ	With Endorsement	6	3
		Without Endorsement	6	2

Discussion

Considering the need to pay attention to the human unconscious as a useful and reliable source of information in order to understand consumer behavior and the capabilities of neuroscience research in obtaining information in this sector, this research examined the role of endorsement strategy on the attention of consumers of sports products with the use of EEG.

The results of the Mann-Whitney U test showed that there was a significant difference between the alpha wave in the state without the endorsement strategy and with the endorsement strategy. For a more detailed analysis, the average alpha wave in different areas of the head (frontal, central, temporal, occipital, and occipital) was examined in both cases with and without strategies. The results showed that the amount of alpha wave when faced with the endorsement strategy in both frontal and occipital regions remained unchanged and decreased in the central, temporal and parietal regions. Research shows that according to the states of alpha waves, when the consumer exposed to marketing stimuli and increases attention and arousal, the amount of alpha waves in the consumer's brain decreases. In consumer neuroscience studies, the decrease in alpha wave has been associated with increased alertness and sensory attention (Frey et al., 2015; Palva & Palva, 2007; Thut et al., 2006). Therefore, since the decrease in the amount of alpha wave indicates an increase in the level of attention and arousal in the brain, it can be said that the decrease in the amount of alpha wave in the central, temporal, and temporal regions during the endorsement strategy indicates an increase in the consumer's attention. These results are consistent with the research results of Sharma and Singh (2015), Wróbel (2000), Barry et al. (2003).

Mann-Whitney U test was used to check the second hypothesis of the research. Considering the significance of the difference between the beta wave in the state without the endorsement strategy and with the endorsement strategy, the average of the beta wave in different areas of the head (frontal, central, regional, temporal and occipital) investigated in two cases. According to the

results, the amount of beta wave has increased in the central, frontal, occipital and parietal regions when faced with the endorsement strategy. Research shows that when the consumer is exposed to marketing stimuli and increases attention and arousal, the amount of beta waves in the consumer's brain increases (Tiago-Costa et al., 2016). Therefore, since the increase in the amount of beta wave indicates an increase in the level of attention and arousal in the brain, it can be said that the increase in the amount of beta wave in the central, frontal, occipital and parietal regions during the endorsement strategy indicates an increase in attention (Andreassi & Filipovic, 2001; Yaomanee et al., 2012).

It seems that due to the fact that the endorsers or sports stars are particularly popular in the society and also because they are the users of sports products themselves, the endorsement of sports products by them draws the attention of consumers to the products and cause a decrease in the alpha wave and an increase in the beta wave in different areas of the cerebral cortex.

According to the results of both hypotheses, the use of an endorsement strategy can play a significant role in attracting consumer attention to a product (Lazar & Pop, 2021; NGUYEN, 2021). The result has demonstrated that attention stressed as the first step in marketing advertising (Wedel & Pieters, 2017) and in advertising strategy, the main focus is related to the produce advertisements that attract the visual attention of the consumer (Wedel & Pieters, 2000). One of the causes, is that consumers are bombarded with considerable advertising information, many of them are forgotten and not remembered (Leong, Ang, & Heng, 1999), So there is essential to utilize various methods to attract the attention of consumers to the product (Pieters, Wedel, & Batra, 2010). The power to attract the attention of consumers can be one of the effective promotion techniques (Pileliene & Grigaliunaite, 2017).

One of the ways that brands usually use to attract the attention and trust of consumers is the use of celebrities such as athletes, actors, and artists (Belch & A. Belch, 2013). Thus, taking into account that the endorsement strategy can be employed as an effective method to attract the attention of consumers and eventually encourage them to buy sports products, it is offered that sports marketers regard the advantages and potential risks, use the endorsement strategy as one of the promotional strategies in their advertising campaigns.

Conclusion

According to the results, endorsement reduces the alpha wave and increases the beta wave in the cerebral cortex. Considering that the decrease of alpha wave and the increase of beta wave are related to the increase of arousal and attention, it can be said that endorsement can attract consumer's attention to marketing advertisements. Although attracting attention does not always lead to effective and intended action, it should be noted that the first step in marketing and persuading consumers to buy a product is to attract its attention. Endorsement can be useful in this regard. Also, the use of neural marketing tools is significant because it can help us reach the consumer's subconscious and provide unbiased and effective information.

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Acknowledgments

Not applicable.

Funding

Not applicable.

Conflict of Interests

No, there are no conflicting interests.