Original Research

Using Eye Tracking Technology to Investigation the Impact of Celebrity Athlete Endorsement on the Attention to Advertising

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ABSTRACT
Nowadays, advertising has become a vast field that does not let go of humans even when they are asleep. Every organization seeks to select and use advertising to reach its target market. Therefore, the purpose of this study was to investigate the impact of sport celebrity endorsement on advertising attention. This research is applied and has been carried out using a quasi-experimental method. The study population consisted of students of the Ferdowsi University of Mashhad, 80 of whom were selected as the sample. This study used an eye-tracking device to record the data as well as Begaze and SPSS 24 to analyze the data. The results showed that the endorser’s fame had a significant effect on attention to ad elements in both “number of fixations” and “fixation duration” indices. Besides, the results showed that there was a significant difference between attention to the endorser’s face and body. According to this research, the endorser acts as an attention grabber in advertising and the endorser’s fame and face also play a significant role in increasing the attention.

Keywords: Endorsement, Advertising, Celebrity Athletes, Eye Tracker, Attention

Introduction
Nowadays, advertising is recognized as one of the most important components of the promotion of blended marketing tools that play an important role in the adoption of corporate marketing policies and strategies [1]. The main focus of corporate finance is on advertising campaigns to seek customers’ attention for their products and brands and to influence their market value; capturing customers’ visual attention is becoming increasingly difficult given the large volume of advertising available in the market [2]. For this reason, making advertising more attractive and effective has always been considered one of the major challenges for companies that have forced them to create and use new methods in the advertising industry [3].

In this regard, one of the tactics that can distinguish and value products and attract the attention of the audience is the use of the endorsement factor [4]. Karla Renton (2009) has defined endorsement as “taking advantage of the popular athlete and non-athlete celebrities to advertise products (both athlete and non-athlete)” [5]. One of the factors that can make endorsement more effective is taking advantage of celebrities because they regularly appear in market communications to facilitate brand familiarity and advertising differences in cluttered media environments [6-10]. As a result, approximately 20-25% of advertising takes advantage of celebrities as endorsers [11], and this trend has increased steadily over the past decades [12]. However, as sports have become increasingly popular among people, taking advantage of athlete endorsers to promote the products and services of companies and organizations is of particular importance. In this regard, companies spend large amounts of money annually on the presence of celebrity athletes in their advertising, reflecting their importance in the advertising industry [13]. For example, PepsiCo paid $ 25 million to Shaquille O’Neal to approve its drinks, and
Nike paid $40 million to Tiger Woods [5]. According to Forbes, "Roger Federer" and "Lebron James" earned about $65 and $52 million in 2018 as endorsers, respectively.” As a result, endorsement studies that can reveal the most optimal endorsement are of great importance [14].

Falsarella, Oliveira, & Giraldi (2017) investigated how audiences pay attention to the endorser using an eye-tracking device in Brazil. The results showed that people pay more attention to brands and products endorsed by celebrities [2]. Moreover, in a study, Felix & Borges (2014) analyzed celebrity endorsers regardless of the important early stage of information processing and purely by paying visual attention to the endorser, using an eye-tracking device. The results showed that the endorser is positively related to the recipient's attractiveness and attitude towards the ad [15]. In this context, Adil et al., (2018) examined how they influence consumer responses through the use of an eye-tracking device, face presence, and gaze direction in print advertising. The findings showed that face presence has a strong influence on the attention and evaluation of advertising and brand as well as on purchase intention [16]. Moreover and et al., (2018) conducted a study entitled "Processing and analysis of electroencephalography signal to evaluate the effect of sport advertisement on customers". The results of which showed that it's possible to find out the effect of sport advertisement Nike brand on brain waves (alpha, beta, delta and theta) by registering the customer's brain waves by electroencephalography. Moreover, by processing and analyzing the signals, we conclude that advertisements increase the amount of analytic and focused thinking, as well as arousal, and can play a significant role into decision making [17].

In another study, Ferguson, & Mohan (2019) examined the impact of a celebrity or non-celebrity presence in a B2B print ad. The findings of this study suggest that the presence of a celebrity endorser is driving managers to pay more attention to advertising [18]. Furthermore, Zhu et al., (2020) examined how endorsement in social media impacts consumer brand perception, product attractiveness, and purchase motivation. The results showed that the brand attitude was influenced by endorser attractiveness and confidence [19]. Moreover, Gilala et al., (2019) conducted a study entitled "Celebrity Endorsement and Brand Passion Among Air Travelers: Theory and Evidence". The results of which showed that celebrity attractiveness had the greatest impact on travelers' brand passion [20].

On the other hand, organizations tending to better understand their consumers and design appropriate products that can use neuroscience as a vital tool. Neuromarketing is a new branch of marketing science that is based on new techniques in the field of neuroscience that leads to better identification and understanding of consumer brain mechanisms to enhance organizational business efficiency [21]. Investigating how consumer behavior is shaped is a process that identifies the determinants of customer preferences, and the ultimate goal of neuromarketing is how to select different brands [22]. Thus, given the importance of athlete endorsers for advertising in organizations and companies on the one hand, as well as decreased use of neuromarketing tools in endorsement research, the researcher sought to answer the question of whether the endorser and his/her fame would affect customers’ visual attention, compared to the ad elements, using an eye-tracking device?

**Material and Methods**
This study is applied and quasi-experimental. The study population consisted of male and female students studying at the Ferdowsi University of Mashhad in the academic year 2018-19. Of these, 80 (50% male and 50% female) were selected as the study sample [15].

**Research Method**
First, the researcher designed the poster. In this respect, an image of men's sunglasses and an image of women's sunglasses were selected and a logo was designed for them. These images were repeated in all advertising posters so that the shape or appearance of the product or logo does not affect the attention of individuals. Two pairs of glasses were selected for the poster because our subjects consisted of both men and women. The logo was also designed because familiarity with a particular brand does not affect the attention of individuals. Then, a
photo of Saeid Marouf and Kimia Alizadeh, suitable for research posters, as well as a photo of an anonymous man and a woman similar to Saeid Marouf and Kimia Alizadeh in beauty, body, and clothing type, were used. Next, all the posters were designed with one design, so that the poster design would not affect the attention of individuals. Nevertheless, the location of the presence of the endorser, product, and logo was moved onto the poster to control the influence of the location or direction on the attention of individuals [23]. Consequently, four posters were designed with the presence of an endorser and one poster with no one present. Each of the four posters that were designed with the presence of the endorser increased to three separate posters with a change in the location of the endorser, product, and logo on the poster. Furthermore, one poster without the presence of an endorser was increased to two posters with a change in product location and logo. Finally, 14 posters were designed. To control the effect of the order of the posters, different distribution methods were used for each subject. For example, the poster that was distributed at the beginning of the images for one subject was distributed to other subjects at a different time.

Next, to record the data, a questionnaire was first given to all subjects to determine the demographic characteristics of the research samples. Then, all of them were asked to sit on a chair embedded in the front of the monitor and wear the eye-tracking glasses. They had to be about 50 to 60 cm apart so that they could only see the computer screen or monitor [15], they were then asked to look at the monitor screen without moving their heads. The “device and glasses calibration” phase was performed to ensure that the glasses were positioned correctly on the subject’s eye. In the final step, images were distributed to the subjects. All participants viewed 14 advertising posters for 210 seconds (each poster for 15 seconds) [15].

In this study, the SMI-ETG2 eye-tracking device was used to monitor the eye movements of individuals. This device is used to measure individuals’ visual attention. The procedure is that the stimulant is presented on the monitor screen and the receiver records infrared waves of eye movements while viewing the monitor screen at a sampling rate of 60 Hz/s. iView was used to record eye movements and Begaze for initial data analysis. In this software, we can measure and compare the amount of viewer’s attention to different areas by defining AOIs. Device outputs include numerical data that can be analyzed in other software such as SPSS.

Results
The study used 80 subjects (50% male and 50% female). The results of the Kolmogorov test showed that the distribution of data was normal for both variables "number of fixations" and "fixation duration" in all areas (P<0.05). According to these results, parametric methods should be used to investigate the assumptions related to these variables.

The results of MANOVA analysis (Table 1) showed that endorser’s fame affects the amount of attention to advertising as the results of eye-tracking indicated that the number of fixations to the ad elements was significant (p=0.0001). In other words, of the three AOIs found in the posters, the largest number of fixations were toward the athlete endorser (male and female) (Figure 1).

<table>
<thead>
<tr>
<th>Effect</th>
<th>DF</th>
<th>F-Value</th>
<th>Mean Square</th>
<th>p</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endorser</td>
<td>1</td>
<td>27.34</td>
<td>1151.40</td>
<td>0/0001</td>
<td>0.079</td>
</tr>
<tr>
<td>Logo</td>
<td>1</td>
<td>7.30</td>
<td>23.69</td>
<td>0.007</td>
<td>0.022</td>
</tr>
<tr>
<td>Product</td>
<td>1</td>
<td>20.63</td>
<td>458.59</td>
<td>0/0001</td>
<td>0.061</td>
</tr>
</tbody>
</table>
Figure 1 shows that the largest number of subjects’ fixations to the ad elements are toward athlete endorser, anonymous endorser, the product in the presence of an anonymous endorser, the product in the presence of an athlete endorser, logo in the presence of an anonymous endorser, and logo in the presence of an athlete endorser, based on the endorser’s fame, respectively.

Next, the average fixation duration to the poster elements was also analyzed to further investigate the role of the endorser in the attention paid to the samples. The results showed that the athlete endorser had the highest fixation duration (Table 2 and Figure 2).

<table>
<thead>
<tr>
<th>Effect</th>
<th>DF</th>
<th>F-Value</th>
<th>Mean Square</th>
<th>p</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endorser</td>
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<td>14.518</td>
<td>4990.430</td>
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<tr>
<td>Logo</td>
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<td>27.959</td>
<td>246.661</td>
<td>0.0001</td>
<td>0.071</td>
</tr>
<tr>
<td>Product</td>
<td>1</td>
<td>18.703</td>
<td>2150.903</td>
<td>0.0001</td>
<td>0.056</td>
</tr>
</tbody>
</table>

Figure 2 shows that the highest subjects’ fixation duration to the ad elements are toward athlete endorser, anonymous endorser, the product in the presence of an anonymous endorser, the product in the presence of an athlete endorser, logo in the presence of an anonymous endorser, and logo in the presence of an athlete endorser, based on the endorser’s fame, respectively.

In this study, two AOI points were identified for the endorser itself (i.e., endorser’s body and face) to further examine the impact of the athlete endorser on advertising. These two points were then analyzed using an eye-
tracking device whose findings showed that the endorser’s face has gained the largest number of fixations and the highest fixation duration. The results in Table 3 and Figures 3 and 4 illustrate the findings of this section. The heat map of the target AOIs is also provided to better investigate this part of the research findings (Figures 5 and 6).

Table 3: ANOVA test results

<table>
<thead>
<tr>
<th>Effect</th>
<th>DF</th>
<th>F-Value</th>
<th>Mean Square</th>
<th>p</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixation Number</td>
<td>1</td>
<td>9.812</td>
<td>511.821</td>
<td>0.002</td>
<td>0.11</td>
</tr>
<tr>
<td>Fixation Duration</td>
<td>1</td>
<td>28.562</td>
<td>10031.209</td>
<td>0.0001</td>
<td>0.266</td>
</tr>
</tbody>
</table>

![Figure 3](image3.png)

**Figure 3:** Mean and standard error of the number of fixations to the endorser’s face and body

![Figure 4](image4.png)

**Figure 4:** Mean and standard error of fixation duration to the endorser’s face and body
Discussion and Conclusion

Capturing the attention of the advertising audience has always been one of the major concerns of advertising owners and designers. One of the elements that have always attracted attention in advertising is the presence of celebrities in advertising. Thus, this study aimed to examine the extent of the audience’s attention to advertising where celebrity endorsers are present. Research findings show that the presence of a celebrity athlete endorser in an advertising poster can attract the attention of the audience. This finding is consistent with the results of the studies of Ferguson, & Mohan (2019), Falsarella et al. (2017), Lee et al. (2017), and Prakash & Shamla (2015). Dugalić, & Lazarević (2017) showed that the majority of audiences (i.e., 61%) were attracted by advertising athlete celebrities who helped them identify the brand [24]. Moreover, in a study, Mehta (1994) compared two groups of customers whose results showed that the rate of positive responses to advertising by customers who viewed a commercial product with a celebrity was higher than that by customers who viewed the same product with an anonymous model [25]. Similarly, Craik & Lockhart (1972) and Feldman & Lynch (1988) also showed that familiar stimuli are more accessible and processed faster and more widely than unfamiliar stimuli [26, 27]. Furthermore, Devue et al., (2009) stated that the samples look at very familiar people for a longer time than the less familiar ones. Assuming the attractiveness of the endorser is permanent, it is predicted that when an ad uses a celebrity, other stimuli will receive less mental processing than when using an anonymous endorser [28].

Now, since celebrity athlete endorsers are more familiar than anonymous endorsers, it is likely that a celebrity athlete endorser will have more influence on brand recall than an anonymous endorser [10]. For example, a celebrity endorser may bring about specific semantic associations in customer memories, while an anonymous endorser may less likely generate mental associations [29, 30]. Consequently, it's likely that the audience's attention to the celebrity athlete endorser in the advertisement will lead to brand interest and even
brand association in the future. Nonetheless, under certain circumstances, celebrities may not have a favorable impact on the brand being advertised, so that consumers will remember only the celebrity and not the brand itself [31, 32]. The fact that a celebrity removes attention from the logo and products featured in the advertisement is an important issue that should be addressed by market managers. Perhaps this is why some managers are worried about a good return on investment (ROI) for celebrities. However, endorsed advertising is still widely accepted and many brand managers believe in the effectiveness of celebrity-endorsed advertising [33-7, 34].

Another part of the study examined the endorser's own points to analyze the extent to which they affect the audience's attention in greater detail. The findings showed that the endorser's face has caught the attention of the research samples more than his/her body. This finding is consistent with the research results of many researchers [15, 16]. Weaver & Lauwereyns (2011) stated that people pay more attention to individuals and their faces among the stimuli contained in the advertisement [35]. Moreover, according to Langton et al., (2008) and Theeuwes & Van der Stigchel (2006), human and human faces attract the highest attention in advertising [36, 37]. Overall, previous research has shown that humans are more likely to prefer human faces from infancy [38] and face preference increases with an increase in age [39, 40].

In this section, by analyzing the variables "average total fixation duration" and "average number of fixations", it was found that the endorser's face is at the center of attention of the research samples and they pay more attention to endorser's face than other areas. This result may promise advertising executives (managers) that the use of endorsers with an attractive appearance (apparent attractiveness) in ads will attract market attention. Furthermore, celebrity endorsers need to pay more attention to their face to get more audience attention.

Overall the results showed that the endorser's popularity leads to more audience attention. This means that using a celebrity athlete in advertising can attract more and more the attention of individuals to advertising. Moreover, celebrities are getting more attention than other stimuli in ads. Furthermore, other results showed that the endorser's face is at the center of the audience's attention and the endorser's apparent attractiveness is a factor in attracting more attention. However, it is also important to note that paying attention to a person, logo, or product does not necessarily lead to interest. The link between visual attention and positive attitude may depend on other variables not measured in this study and future research may clarify this issue.

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References


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چکیده فارسی

بررسی تأثیر صحه‌گذار ورزشی مشهور بر توجه به تبلیغات با استفاده از فناوری رقابتی چشم

محمد زحمتی، سید مرتضی عظیم‌زاده، محمد صابر ستوده

امروزه تبلیغات عرضه بسیار وسیعی را فراهم کرده که حتی در خواب هم انسان‌ها را رها نمی‌کند. هر سازمانی به دنبال انتخاب و استفاده از تبلیغاتی است که از طریق آن بتواند به بازار هدف خود دست یابد. از این رو، هدف از تحقیق حاصل تعيین نقش صحه‌گذار و شهرت آن بر میزان توجه به عناصر موجود در تبلیغات است. این پژوهش کاربردی بوده و به روش نیمه تجربی انجام شده است. جامعه تحقیق شامل دانشجویان دانشگاه فردوسی مشهد بودند که از بین آنها 80 نفر به عنوان نمونه انتخاب شدند. در این تحقیق از دستگاه ردیاب چشمی برای ثبت داده استفاده شد و نرم‌افزار بیجی و اس.پی.اس نسخه 24 برای تحلیل داده‌ها به کار گرفته شد. نتایج نشان داد که اثر شهرت صحه‌گذار بر توجه به عناصر موجود در تبلیغ در هر دو شاخص تعداد و مدت زمان خریدگی معنادار است. همچنین برطبق نتایج بین توجه به چهره و تن صحه‌گذار تفاوت معنی‌دار وجود داشت. بر اساس این تحقیق، صحه‌گذار به عنوان یک عامل جذب کننده توجه در تبلیغات می‌باشد و چهره صحه‌گذار نیز در افزایش میزان توجه نقش معناداری دارد.

واژه‌های کلیدی: صحه‌گذاری، تبلیغات، ورزشکاران مشهور، رقابتی چشمی، توجه