



Research Article

Football Spectators' Attention to Advertising: Gender Perspective

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Abstract

Objective: The objective of this study is to quantitatively measure the role of spectators' gender in the intensity of their attention to advertising during a football match. Subsequently, it aims to answer the question: Does gender affect attention to advertising?

Methods: Adopted a semi-experimental research design to collect data on viewers' attention to advertisements using eye tracking. In addition, a mixed between-within ANOVA and *t*-test were conducted to test the research hypotheses.

Results: The research findings showed that viewer gender significantly affected the attention to the ads. In fact, in this research, women paid more attention to advertisements while watching football than men.

Conclusion: While there is a plethora of evidence in advertising that supports the positive effects of various advertising types and locations on viewer attention, little is known about the role of gender differences on viewer attention when watching a football match on TV. This study contributes to the existing knowledge in advertising research by offering a series of research agendas on the key indicators of advertising effectiveness, especially consumer attention. More specifically, the study seeks to improve the understanding of advertising effectiveness by measuring consumers' neurophysiological responses to advertising messages.

Keywords: gender differences, advertisement effectiveness, eye tracking, overlay advertising, prosocial message

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1 INTRODUCTION

Advertisement attention is the first step in evaluating advertising effectiveness^[1]. By measuring the degree of

consumer attention, a marketer can identify the ability of an advertisement to capture viewers' engagement with the media message^[2]. In the sports context, advertisers

intend to show their signage and messages to television viewers through televised sports events with an expectation that they can draw the viewer's attention to their message and signage effectively^[3-5].

This study seeks to improve the understanding of advertising effectiveness by measuring consumers' neurophysiological responses to advertising messages. Nowadays, social responsibility messages are presented more than before through advertising through sports^[2]. Therefore, in-stadium signage including social responsibility messages is selected to see consumers' attention on it, and several factors embedded in this type of signage such as color^[2,6,7], location^[2,7,8], contents^[2,6,9], spectator's gender^[10,11], and the level of engagement^[8,12] are considered. These factors are assumed to have impacts on viewer attention^[13,14]. By sorting out these challenges, advertisers can find better directions in designing prosocial advertisements through sports^[15-17]. Overall, the unique objective of this study is to quantitatively measure the role of spectators' gender in the intensity of their attention to advertising during football matches on television with eye-tracking technology. Subsequently, it aims to answer the question: does gender affect attention to advertising?

1.1 Visual Content Consumption by Sports Spectators

Viewers are exposed to various visual information when they watch sports events through the media. Since the human ability to process information at once is limited^[2,6], they adopt a selection mechanism to protect themselves from the information overload over media^[18]. This mechanism is generally called attention. Viewers' attention when watching sports through media may take place in two ways^[19,20]. First, when a football match is being watched, a viewer's top-down attention is supposed to be focused on the match itself, including the course of the event, players, ball moves, the goals, scores, exciting scenes, etc.). Another format is saliency-based visual attention^[2,6]. Based on this concept, another way of forming attention to an advertising message depends on its color, size, type, and location on the screen^[6,21-24]. Since the main goal of this research is to measure the viewer's attention to advertisements, the viewer's attention to advertisements is extracted through an eye tracker that includes duration and fixation.

1.2 The Impact of Different Factors on Viewers' Attention

According to recent research, different factors may impact sports spectators' attention during a match: For instance, we can mention the color of the message, gender, age, ethnicity, and culture of the viewer. For instance, colorful signage is popularly used by many advertisers to capture viewers' attention effectively during televised football matches^[2]. Also, Choi et al.^[25] adopted qualitative

research to explore the effect of color on viewer attention. They found that the use of warm colors (e.g., red) in advertisements attracted more attention than cold colors (e.g., blue). Rumpf et al.^[7] measured viewer attention to the advertisement near and behind the goal post, around the football pitch, and on players' shirts using eye tracking. One interesting finding was that color interacted with viewers' attention but the degree of lightness or shining of the brand did not make any changes in their attention; yellow resulted in the lowest viewer attention while red and green rather than blue led to the highest level of viewer attention^[7]. In general, it is argued that the contrast between brand color and the color of its context results in positive viewer attention.

The construct of attention has been examined from cultural and ethnic points of view. Although there were no studies in the field of sports advertising. Past research has identified east-west differences in visual attention associated with a high-level philosophical perspective: holistic versus analytic style. Notably, research reveals that easterners are more context-oriented, focusing on contextual detail and relationships in their perception of surroundings and conversely, Westerners are more object-oriented, focusing on salient, unique objects^[26,27]. Additionally, Easterners pay more attention to group-related information and contextual detail concerning target objects, while Westerners center their focus on salient objects, self-relevant, and category-related data^[28-30]. In other words, Easterners allocate attention more broadly than Westerners and can handle more complex visual information but have difficulty ignoring interference from contextual information even when asked to ignore it^[28,31,32]. Therefore, Easterners may tend to look into detailed, local information, while westerners may focus on big, salient, objects. When asked to explain event causation, easterners reference larger amounts of information with only marginal importance, but Westerners refer to smaller amounts of information^[25]. These mentioned studies generally reaffirmed that easterners tend to have a holistic viewpoint paying attention to relationship and detail, while westerners possess an analytic cognition paying attention to salient elements and categorical data^[33]. Supporting evidence from the patterns of eye-movement conducted by Masuda and Nisbett^[26] shows that easterners' attention is easier to distract by contextual information. In their experiment, while participants were asked to focus their attention to the central circle and disregard four interference circles, Easterners tried to pay attention to the target but failed to only focus on the target circle. Easterners' quantity of fixation and deviation of eye-movement from center within the 30 second period were both significantly larger compared to Western counterparts^[26].

Regarding the effect of age on paying attention to advertisements and messages, it can be said that older

adults pay greater attention than younger adults to online banner ads^[34]. Younger consumers are more likely to recall information presented in an advertisement but are less likely to be persuaded by that information. Conversely, mature consumers are much less likely to recall information in an advertisement but are more likely to be persuaded by the information. Thus, at a macro level, the recall-persuasion link does not seem to hold when young and mature consumers are examined. At a more micro level, however, distinct elements are identified that have a particularly strong impact on both recall and persuasion for young consumers and mature consumers^[35]. The above information was presented because this research was conducted in Iran and among young people aged 20 to 35.

1.3 The Role of Gender in Attention to Advertisement

Gender is a decisive demographic factor in market segmentation research^[10,36,37]. Marketers can benefit from taking gender differences into account to effectively advertise their brands^[10]. In previous studies, women prioritized advertising features such as type of advertisement, color, and the attractiveness of advertisement^[10], providing important information in designing advertising content to draw the attention of this target group. In this regard, Sørsum^[11] conducted a study, using eye-tracking and revealed that men watched the advertisement several times more than women whereas women intended to recall it better than men. Gender differences did not play a key role in attention to the advertisement but in terms of remembering the content of the advertisement, women outperformed men^[11]. Similarly, Cummins et al.^[38] examined the role of individual differences in selective attention to images in sports events. The findings implied that there was no significant difference in attention to images and almost all the subjects equally attended to them. Also, the subjects who turned out to have prior knowledge of the sports field and those who were interested in that sports paid more attention to the graphic advertisement while they spent a relatively long time watching the images.

1.4 Degree of Attention to Types of Advertisement Signage

Although an overlay advertisement is one type of advertisement, there are fewer studies investigating its effect on viewer attention while watching a sporting event on TV. Since overlay advertising messages are frequently utilized during televised sporting events such as football, it is necessary to examine the extent to which these messages are noticed by viewers^[2]. Because of the novelty of such animated signage patterns, several studies were conducted on the impacts of different types of advertisements on viewer attention.

In a study, Hong et al.^[39] concluded that animated

advertisement was more effective in drawing viewer attention compared with static advertisement. In addition, Lang et al.^[40] noticed that animated advertisements received higher attention from viewers. Given the previous findings, it may be concluded that the more animated and dynamic the advertisement is, the higher the attention paid by TV viewers is. However, the certainty of such a claim is under question as there are other factors to be considered such as animation intensity, advertisement type (content), design, time of display, and its on-screen location^[41]. For instance, Li^[42] observed that individuals spotted images more easily than text, and images were better identified in their focus of attention. Also, an advertisement that keeps changing constantly captures less viewer attention and arouses feelings of confusion with the advertisement. Cummins et al.^[43] conducted a similar study on awareness of overlay signage and found that most subjects were aware of this type of signage. It was noted that in the context of recurring signage, as soon as a new advertisement was displayed, viewer attention was shifted to it. Likewise, Breuer and Rumpf^[46] identified that dynamic advertising around the sports environment captured a higher level of attention than static ones. In the same vein, Lee and Ahn^[44] revealed that animated advertisements received less attention than static advertisements. Also, Higgins et al.^[45] undertook a similar study and reported that the use of novelty in an advertisement would help capture maximum viewer attention and lead the viewer to memorize the signage content. Moreover, Boronczyk et al.^[12] observed that the subjects paid little attention to familiar signage formats.

Nowadays, delivering prosocial messages to people through advertising is common during televised sports events^[46]. However, only a few studies are testing the effect of overlay advertisements with a prosocial message on viewer attention in sports settings (e.g., Oboudi et al.^[2]). Since the televised display of highly favored sports events such as football in some countries is accompanied by overlay advertisement, it is necessary to provide solid information about the extent to which a prosocial message on an animated signage format is noticed by the viewer. According to the information from past literature reviewed above, it is evident that multiple factors interact with the level of viewer attention to in-stadium signage (both textual and graphic). This study seeks to address the gap in the current knowledge and accordingly evaluate viewer attention to signage with the prosocial message during an attractive versus an ordinary football match. More specifically, this study considered the effect of viewer gender on attention to the prosocial message. Eye tracking was used to measure the viewer's attention to the prosocial message. This tool measures two variables: the number of fixations and the duration of fixation. The durations and the fixations

on the prosocial message are considered important indicators of viewer attention^[47-49]. Therefore, given the literature reviewed in the section, we hypothesize that four colors (blue, yellow, red, and green) used for the overlay message displayed in the context of two different types of a match (attractive and ordinary) can arouse different reactions in viewers' attention in terms of their gender (male or female). Since the main purpose of this research is to investigate the effect of gender on paying attention to advertisements, the following hypotheses were formulated:

H1: viewer gender affects the degree of attention measured in fixation.

H2: viewer gender affects the degree of attention measured in duration.

2 MATERIALS AND METHODS

2.1 Sampling Procedures

In this study, a quasi-experimental design was used to determine the effect of gender on viewers' attention to the prosocial message. First, voluntary participants (with no rewards or wages) were recruited from students attending a university in Iran. The code of ethics for this study was approved by the Iran National Committee for Ethics in Biomedical Research. The visual health of subjects who agreed to participate in the study was examined, and those with visual issues such as color blindness and poor vision, including those who wore reading glasses, were excluded from the final sample. A total of 60 samples who filled out a consent form participated in the study. Notably, the participants were not aware of the objective of the study, ensuring that there was no selection bias. The participants were told that they were going to be exposed to a football match for a few minutes. Demographic information such as gender, level of education, age, and major was obtained using a questionnaire. Out of 60 samples, 30 samples were males and the other 30 samples were females. A total of 41 subjects (68%) were students of physical training and sports sciences and 19 students (32%) were pursuing other majors. A majority of the sample was undergraduate students (77%), followed by master's degree students (15%) and doctoral students (8%). The subjects' age ranged from 20 to 35 ($M=25.1167$, $SD=3.39537$).

2.2 Experimental Protocol: Selecting Video Clip and Designing Signage

The participants' attention to the prosocial message was measured using eye-tracking technology (pupil model) in a laboratory. Each participant individually watched two short video clips: one featuring an attractive football match with 110 seconds and the other featuring an ordinary match of the same length. There was a three-minute time interval between the clips. Both video clips were concerned with the matches between

two popular clubs (Esteghlal and Persepolis) in Persian Gulf Prof League. The researchers formed a panel of 10 football experts, including players, coaches, instructors, and researchers, to determine the attractiveness of the match. After seeking advice from the experts in sports marketing, the following prosocial message was created: "The players of Esteghlal and Persepolis clubs donated 5 percent of their contract value to charity organizations." This message was embedded in both clips in four different colors (blue, yellow, red, and green). It kept displaying in regular intervals for 9 seconds in each color in the form of an overlay message (refer to Figure 1). Before the clips were displayed, the subjects were seated on the chair so that they had the right distance from the laptop screen (at least 50 centimeters) and put on the glasses after one of the researchers calibrated the eye-tracking device with the video clip.

2.3 Data Analysis

Before the main analyses, the data related to the viewer's eyes were first recorded through the software related to the eye tracking device (Pupil) and then entered into the SPSS software to test the hypotheses. The normality of the data was examined using the Kolmogorov-Smirnov test. This assesses the normality of the distribution of scores. A non-significant result (Sig. value of more than 0.05) indicates normality. In this case, the Sig. value is 0.000, suggesting a violation of the assumption of normality. This is quite common in larger samples. And also, the homogeneity of variance which needs to be met to proceed with ANOVA^[50], was tested. For the main analyses, a mixed between-within ANOVA, *t*-test, and regression were conducted to test the research hypotheses. In this study, four different colors (blue, red, yellow, and green) and type of match (attractive or ordinary) were within-group factors while gender (male vs. female) was a between-subjects factor. If the group effect (between groups effect) was significant, the Scheffe follow-up test was employed to identify where the difference lay. There are several different post hoc tests that we can use, and these vary in terms of their nature and strictness. The assumptions underlying the post hoc tests also differ. Some assume equal variances for the two groups (e.g., Tukey); others do not assume equal variance (e.g., Dunnett's C test). Two of the most commonly used post hoc tests are Tukey's Honestly Significant Different test and the Scheffe test. Of the two, the Scheffe test is the most cautious method for reducing the risk of Type 1 errors.

3 RESULTS AND DISCUSSION

3.1 Preliminary Analysis

The preliminary analysis of the questionnaire data showed that there was no significant difference in viewer attention to social messages between men ($n=30$) and women ($n=30$; $t[58]=0.83$, $P=0.412$). An interesting

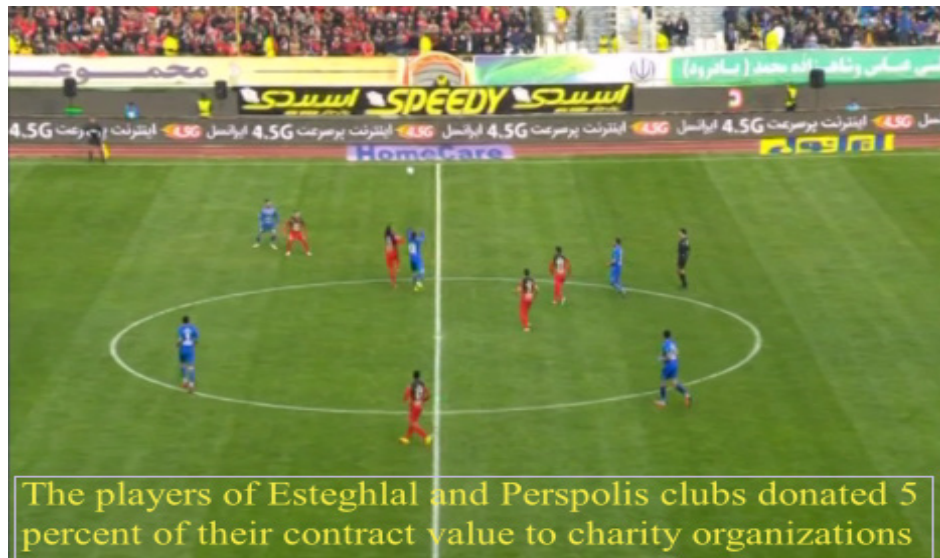


Figure 1. Prosocial Message Used in the Experiment.

point the eye-tracking data showed the opposite results of the questionnaire, so that for the eye-tracking variables (fixation and duration), women showed more attention to signs than men, and the differences were for fixation ($t[58]=10.79$), $P<0.001$) and duration ($t[58]=10.40$, $P<0.001$) were significant.

Descriptive statistics were used to compute measures of central tendency and variability of attention for each condition, reported in second(s) for a time of duration and an average number of frequencies each viewer enters in AOI (overlay prosocial message) for the duration (Table 1). In coherence with the descriptive data, each metric was analyzed independently.

3.2 The Main Effect of Gender, Type of Clip, and Color of Prosocial Message on Viewer's Fixation

The results of the mixed ANOVA regarding the effects of gender, clip type, and color on the viewer's fixation revealed that the interaction effect of color*type of clip*gender was significant; $F(3, 44)=3.20$, $P=0.0$, $\eta^2=0.05$. The interaction effect of gender*type of the clip was also significant; $F(1, 56)=7.49$, $P=0.008$, $\eta^2=0.11$. However, other interaction effects (color*gender and color*type of the clip) were not significant (see Table 2 for details). As for the main effects, all three effects on fixation were significant; $F(3, 56)=20.82$, $P<0.001$, $\eta^2=0.26$ for color, $F(1, 58)=18.14$, $P<0.001$, $\eta^2=0.24$ for a type of clip, and $F(1, 58)=111.34$, $P<0.001$, $\eta^2=0.66$. Given the significant main effects of color, gender, and type of clip, we conducted the follow-up Scheffe post hoc test to determine where the difference lies. The results revealed that the significant differences for the main effect of color in Mixed ANOVA came from the comparisons between red and blue ($P<0.001$), blue and green ($P<0.001$), yellow and green ($P<0.001$), and

finally yellow and red ($P<0.001$). Regarding the type of clip, the results indicated that a higher level of attention was paid to the signage in the attractive clip, which was significant ($P<0.001$). Similarly, the results for the main effect of gender indicated that a higher level of attention of women than men was paid to the prosocial message, which was also significant ($P<0.001$; see Table 2 for details).

3.3 The Main Effect of Gender, Type of Clip, and Color of Prosocial Message on Viewer's Duration

The mixed ANOVA results showed that the interaction effect of gender*type of clip*color on duration was significant; $F(3, 44)=3.40$, $P=0.019$, $\eta^2=0.55$. The interaction effect of gender*type of the clip was also significant; $F(1, 56)=9.43$, $P=0.003$, $\eta^2=0.14$. However, the interactions between color and type of clip were not statistically significant (see Table 3). Again, all three main effects on duration were significant; $F(3, 56)=18.11$, $P<0.001$, $\eta^2=0.24$ for color, $F(1, 58)=13.77$, $P<0.001$, $\eta^2=0.19$ for type of clip, and $F(1, 58)=88.56$, $P<0.001$, $\eta^2=0.60$ for gender. Having found significant values for the main effects of color, gender, and type of clip, the follow-up Scheffe post hoc test was conducted to determine the individual comparisons. The results revealed that the significant differences in the main effect of color came from the comparisons between red and blue ($P=0.003$), blue and green ($P<0.001$), yellow and green ($P<0.001$), and yellow and red ($P<0.001$). This interpreted that the viewers paid more attention to blue and yellow than to red and green signage. As the type of clip had a main effect on the duration of the viewers, the post hoc analysis was conducted. The results showed that the difference observed for the main effect of the type of clip (attractive vs. unattractive) was due to a higher level of attention to the prosocial message in the unattractive

Table 1. Descriptive Duration & Fixation Data of Eye-tracking in Viewer's Attention to Prosocial Message

Color	Condition	Gender	Mean (Fixation)	SD (Fixation)	Mean (Duration)	SD (Duration)	N
Blue (1)	Attractive Clip (1)	Female	3.47	1.89	2.21	1.37	30
		Male	1.24	1.30	0.64	0.75	30
		Total	2.35	1.96	1.43	1.35	60
	Ordinary Clip (2)	Female	3.40	1.30	2.12	1.01	30
		Male	1.80	1.54	1.16	1.10	30
		Total	2.60	1.63	1.64	1.15	60
Yellow (2)	Attractive Clip (1)	Female	3.40	1.57	2.09	0.96	30
		Male	1.27	0.94	0.83	0.51	30
		Total	2.33	1.67	1.46	0.99	60
	Ordinary Clip (2)	Female	3.33	2.06	1.86	0.92	30
		Male	3.03	1.83	1.72	0.92	30
		Total	3.18	1.93	1.79	0.91	60
Red (3)	Attractive Clip (1)	Female	2.40	1.47	1.46	1.09	30
		Male	0.34	0.75	0.21	0.38	30
		Total	1.37	1.56	0.84	1.02	60
	Ordinary Clip (2)	Female	2.87	1.31	1.83	1.02	30
		Male	1.30	1.44	0.75	0.75	30
		Total	2.09	1.57	1.29	1.05	60
Green (4)	Attractive Clip (1)	Female	2.07	0.98	1.28	0.65	30
		Male	0.61	0.93	0.38	0.55	30
		Total	1.34	1.20	0.83	0.75	60
	Ordinary Clip (2)	Female	2.53	0.82	1.44	0.55	30
		Male	0.97	1.21	0.60	0.75	30
		Total	1.75	1.29	1.02	0.78	60

Table 2. Tests of Within-between Subjects Effects for Viewer's Fixation to Prosocial Message

Source	df	Mean Square	F	Partial Eta Squared
Color	3	40.79	20.82*	0.26
Clip	1	37.26	18.14*	0.24
Gender	1	312.16	111.34*	0.66
Color*Gender	3	2.99	1.52	0.03
Clip*Gender	1	15.38	7.49*	0.11
Color*Clip	3	2.25	1.47	0.03
Color*Clip*Gender	3	4.92	3.20*	0.05

Notes: *Significant effect at $P < 0.05$.

clip, which was also significant with $P < 0.001$ (see Table 3). Similarly, the significant difference in the main effect of the gender indicated that higher attention was paid to the prosocial message by women than men ($P < 0.001$). With regards to the interactions of gender*type of the clip as well as those of color*gender*type of the clip, Scheffe post hoc tests were followed up to identify individual comparisons. The results showed that both female and male viewers paid more attention (duration)

to the prosocial message embedded in the ordinary clip than in the attractive clip. Also, the female subjects turned out to pay more attention to the prosocial message than males in both clips. Finally, the female viewers attended to four colors more than their male counterparts.

In sum, the female subjects' attention was significantly higher than that of the male subjects in terms of both

Table 3. Tests of Within-Between Subjects Effects for Viewer's Duration to Prosocial Message

Source	df	Mean Square	F	Partial Eta Squared
Color	3	14.17	18.11*	0.24
Clip	1	10.56	13.77*	0.19
Gender	1	119.23	88.56*	0.60
Color*gender	3	2.04	2.61*	0.04
Clip*gender	1	7.23	9.43*	0.14
Color*Clip	3	0.45	0.86	0.02
Color*Clip*gender	3	1.78	3.40*	0.06

Notes: *Significant effect at $P < 0.05$

frequencies and duration of eye fixation in both clips. In addition, the female participants had higher levels of fixation and duration when watching the ordinary clip than the attractive clip.

Nowadays, advertisers attempt to promote their products and services using prosocial messages through the medium of televised sports events^[2]. They spare no attempt to have the upper hand in competition with their rival groups. On the other hand, according to Breuer and Rumpf^[6] and Itti and Koch^[19], viewers tend to concentrate their attention on more attractive moments of a match^[51]. Thus, they pay less attention to other peripheral contents such as in-stadium signage. As a result, advertisers work towards achieving their advertising goals without distracting viewers from the main course of sports events. For instance, in the model of AIDA and ARM for advertisement effectiveness, one of the key indicators of measuring the effectiveness is viewer attention. Using eye tracking, viewer attention to prosocial message (one type of advertisement) was evaluated during the televised football match in Iran for this study. In this section, the findings of the study on the interaction of prosocial message, viewer gender, and the attractiveness of the football match with viewer attention (duration and fixation) are discussed.

First, the novelty of the current study is its focus on the gender of viewers' attention to the overlay prosocial message. This aspect of advertisement which is an under-researched area in this field not only addresses a challenge faced by future researchers but also assists advertisers to improve the effectiveness of their advertisement drawing on the findings of eye tracking in measuring attention to the advertisement. Most of the existing literature in this area explored viewer attention to animated advertisements. The reason is that animated advertisements are eye-catching and colorful when displayed on digital perimeter boards, come in different sizes and fonts, are displayed at regular intervals, and are conspicuous in terms of the quality of the images and

camera angle used. Perhaps, one of the main reasons why animated signage (digital board) is not taken seriously is the lack of attention to the factors mentioned above in the design of perimeter signage in a stadium. In other words, it can be said that overlay prosocial messages are a kind of animated advertisement to which the viewers are exposed during a televised football match. According to the movement effect theory^[52], any sort of movement is likely to capture viewer attention although it is considered an advertising deception. In support of this line of the argument, it has been believed that animated advertisements can attract more attention^[23,39-41,53]. Therefore, it can be concluded that an overlay prosocial message is an effective tool in capturing viewer attention to ensure advertising goals.

Second, one important contribution of this study is to explore the interaction between gender and attractiveness of the sports event with viewer attention to the signage. Gender is an important factor that advertisers would consider in the market segmentation and target population and researchers use it as an important variable in their studies. Although in the limited number of studies dealing with advertisement in the context of sports events, gender was not shown to be a significant variable^[6-8,54] and, in some studies^[10,38], male consumers showed higher values in attitude, feelings, recall, and attention, this study revealed that females turned out to pay more attention to prosocial message than males. This finding is consistent with that of Kong et al.^[55], and contradicts the previous results^[9,11,38]. Therefore, it is expected that practitioners take these important findings into account besides other important factors (e.g., the content of the advertisement, the placement and display of it, the color and design of advertisements, the age and different groups of television viewers).

Caution should be exercised in using the findings concerning the attractiveness of the football match and its effect on viewer attention because advertisers might have difficulties in determining the level of

attractiveness. It was noticed that when a televised sports event is in its dull moments and not very attractive, viewers pay relatively higher attention to advertisements. This consumer tendency is supported by several studies^[8,19,52,56]. Given this finding, advertisers are advised to avoid overlay advertisements during important moments such as penalty kicks, goal scenes, and free kicks because at these moments, they would fail to capture a higher level of attention from viewers.

4 CONCLUSION

Eye tracking data showed that women's attention to advertisements is more than that of men's, so both research hypotheses were confirmed. Perhaps, one of the reasons for that is women's more attention to detail and micro-vision in looking at the football match compared to men. Another reason is that women are less interested in football than men.

In this study, we sought to add viewer gender to the existing knowledge in marketing literature as an effective advertising factor in capturing viewers' attention. This variable can offer marketers new insights into making informed decisions to make advertisements in the context of televised sports events in a specialized field.

The fact that marketers and researchers can identify the important factors interacting with the effectiveness of the advertisement would not guarantee its effectiveness. However, the negative factors threatening the degree of effectiveness should also be identified and minimized. For example, excessive display, display at the wrong time and wrong position, inappropriate arrangement of advertisement, font of advertisement, screen size, advertisement content, camera angle, quality of broadcasting, etc. are among the factors that result in viewer confusion and negative attitude towards the advertisement. Any factors negatively affecting viewers would jeopardize the effectiveness of advertisement signage.

It is necessary to mention that the study was not able to control possible factors that may influence the results. For example, most of the research subjects were likely to watch matches between Persepolis and Esteghlal clubs in the past, having a certain bias towards either team. In addition, it was not possible to manage all subjects to watch a live broadcast for a long time in the laboratory. Moreover, the self-designed overlay prosocial message was used to test the subjects' degree of attention. Although the viewers paid more attention to the overlay prosocial message, future researchers are advised to evaluate viewer attention to actual overlay ads using eye-tracking.

It is suggested that future researchers evaluate and compare viewers' other psychological outcomes such as perception, attitude, or loyalty when they watch sports

event and messages on signage at once. In addition, it is better to measure the level of attention of TV viewers to advertisements when broadcasting live sports events by using EEG and eye tracking. Also, the evaluation of the advertising effectiveness in this study was limited to the use of eye-tracking only, and this device can measure viewers' attention only. To overcome this limitation, the use of other neuromarketing tools such as EEG and fMRI^[57] with multiple methods^[37] would help scholars and practitioners better understand the effectiveness of advertising in this subject matter.

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Conflicts of Interest

The author declared no conflict of interest.

Author Contribution

Oboudi B contributed to the manuscript and approved the final version.

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