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ARTICLE

Does the Game Matter? Analyzing Sponsorship Effectiveness and Message Personalization in Sport Live Broadcasts

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This study aims to increase the effective use of in-stadium sponsor message placement by analyzing the influence of various run-of-play characteristics on television viewers' visual attention allocation. Sports broadcasts constitute one potential platform for sponsors to place personalized messages. However, literature still questions the effectiveness of in-stadium sponsor messages, and the influence of game-related factors on viewers' visual attention has received little consideration in this context. In addition, researchers call for more reliable and realistic measures concerning the effective evaluation of sponsorship-linked marketing. Therefore, this study uses real-time adaptions (eye-tracking, in-play betting odds, etc.) utilizing live soccer broadcasts as one of the first. Data were analyzed second by second ($n = 100{,}298$) using generalized linear mixed models. Results indicate significant associations of several run-of-play characteristics with viewers' visual attention to sponsor messages depending on the characteristic, the games' degree of suspense, and playing time. Findings provide hands-on advice for practitioners to enhance sponsor message placement during live broadcasts.

Keywords: professional sport management, sport marketing, sport advertising, broadcasting, televised viewing

Broadcast-embedded message placement, including sponsorship-linked marketing, has become one essential instrument in today's marketing communication and the field of sport management (e.g., Chadwick & Thwaites, 2004). Besides the vast potential of sport events to engage and connect with the consumers' passion (Meenaghan & O'Sullivan, 2001), professional soccer clubs generate significant income from the sale of broadcasting rights and sponsorships (Deloitte, 2020; IEG, 2022), based on the attraction of massive audiences (Barros et al., 2007). As viewers desire to watch thrilling sports live broadcasts for years (e.g., LBBOnline, 2022; Sportico, 2022), sport marketing managers seek to link their brands for various objectives with pleasant emotions elicited during suspenseful games (e.g., Desarbo & Madrigal, 2011; Lee et al., 2019). Raising attention, building brand awareness/image/equity, goodwill, and marketplace behavior constitute such sponsorship objectives (Cornwell, 2019).

Within the sponsor–sponsee relationship between companies and soccer clubs, hence, companies provide a substantial financial resource to accomplish any sort of return on investment. The higher thereby the amount of money involved, the higher the efforts to evaluate the sponsorship deal in any form (O'Reilly & Madill, 2012). However, effectively evaluating sponsorships is still a highly controversial topic as (a) sponsorship outcomes are often not measured at all or measured insufficiently (concerning both academics and practitioners) and (b) reliable and realistic approaches to evaluate the sponsorships are missing (e.g., Cornwell & Kwon, 2020; Jensen & White, 2018).

Based on O'Reilly and Madill's (2012) process model for sponsorship evaluation, it is essential to identify measurable sponsor/see objectives within the first stage of any evaluation. Concerning embedded sponsor messages within soccer television (TV) broadcasts, the concept of visual attention, as one potential consumer outcome measure of sponsorship evaluation, is fundamental to evaluate several sponsor objectives: The first necessary step to process sponsorship information for humans is the visual eye contact with sponsor messages (Lamme, 2003). Thus, evaluating visual attention is a necessity as other outcome measures solely come forth if sponsor messages have been visually attended prior (e.g., Breuer & Rumpf, 2012; Lardinoit & Derbaix, 2001).

During live broadcasts, viewers are able to pay only a small share of attention to sponsorship messages as they experience an information-overloaded environment (d'Ydewalle & Tasmin, 1993), and their primary interest lies in the sporting action itself (Breuer & Rumpf, 2012; Lardinoit & Derbaix, 2001). Over the past decades, research mainly examined how sponsor- and viewer-related factors determine the amount of visual attention paid to sponsor messages (e.g., Boronczyk et al., 2018; Henderson et al., 2019). However, nearly all bigger soccer stadiums are meanwhile equipped with real-time playable digital light-emitting diode boards (LED boards), which allow sport marketing managers and sponsors to adjust their messages on a second-by-second basis. Thus, digitalization and new technologies allow for sponsor message personalization, and real-time adaption leading to a new stream of research taking the influence of the central action itself (the game) into account. So far, little is known about the influence of game-related factors, like games' run-of-plays, on sponsorship effectiveness. Breuer et al. (2021), as well as Boronczyk et al. (2021), provide first evidence that the run-of-play potentially

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affects sponsor communication outcomes. However, both did not elaborate on the influence of distinct run-of-play characteristics on viewers' visual attention allocation to sponsor messages nor provide hands-on advice.

The aim of the underlying study is, therefore, (a) to increase the effective use of sponsorship-linked marketing and message personalization by assessing the influence of live soccer game's run-of-play characteristics on viewers' visual attention allocation to sponsor messages through (b) applying more reliable and realistic evaluation methods to sponsorship effectiveness by using an attention measure and real-time adaptions. Furthermore, the interaction effects of soccer games' degree of suspense and playing time within this relationship should be analyzed.

Present research on visual attention primarily uses video sequences or recorded and nonbiometric data solely, which is different to this study. Additionally, all aspects of pricing and sponsor–sponsee negotiation are stated to be underresearched (Cornwell & Kwon, 2020). Until now, practitioners mostly use media exposure metrics to evaluate sponsorship effectiveness (Meenaghan, 2011), while research increasingly emphasizes the importance of evaluating consumer engagement objectives (Cornwell, 2019; Meenaghan, 2013).

The findings of this study, therefore, (a) enhance the research on sponsorship evaluation by utilizing improved methods and new data streams applying visual attention as one form of consumer outcome measure, (b) extend the literature on sponsorship evaluation by elaborating on game-related influences for sponsorship effectiveness the first time holistically and systematically (contributing to effective price management and negotiation between the sponsor/see), (c) present a realistic and innovative quasi-experimental setting to academics and practitioners concerning sponsorship evaluation, and (d) contribute to close the gap between theory and practice by overcoming the often heavily criticized exposure measures (e.g., Shilbury et al., 2009) and raising the effectiveness of message personalization to pursue sponsors' objectives.

Literature and Theoretical Framework

Sponsorship Effectiveness

Numerous studies examined factors that influence sponsorship effectiveness (Jensen & White, 2018; Kim et al., 2015). Within this literature stream, various outcome measures of sponsorship effectiveness were introduced (e.g., visual attention, purchase intention, brand awareness, and image). Studies elaborating on visual attention mainly researched sponsor-related (e.g., color, movement, fit, and congruence) and viewer-related (e.g., knowledge, awareness, and involvement) influencers. For example, Breuer and Rumpf (2012) found that exposure-related variables like brand logo size and exposure duration significantly affect visual attention to sponsor messages. Also, message color (Toh et al., 2022) and animation seem significant (Breuer & Rumpf, 2015; Otto & Rumpf, 2018). Concerning viewer-related factors, Lee et al. (2019) associate viewers' identification with the sponsored sports team as a factor, while Boronczyk et al. (2018) state the level of sport involvement and familiarity with the sponsor brand as relevant. Additionally, attitudinal and behavioral support intensity is reported (Nazari et al., 2021).

Recent literature indicates that also game-related determinants for sponsorship effectiveness can be precious. Three studies were found elaborating on the influence of games' run-of-plays on visual attention to sponsor messages. Le Roy and Vivier (2008) found that during rugby games, the attention to sponsor messages is higher in times without sporting action, for example, time-outs and penalties. However, their results were based on 30 cases and simple correlation analysis and did not consider any game-related controls. Boronczyk et al. (2021) unveiled that game time effects and interaction effects between ball possession and the score as well as the ball position in games matter. Findings reveal decreased attention to sponsor messages if the attacking team controls the ball near the opponents' goal. At last, Breuer et al. (2021) state additional to time effects, the games' degree of suspense as significant indicator of viewers' visual attention to sponsor messages. Given the increased use of big data, the trend to watch sport online streams, and new in-stadium technologies, it seems feasible to account for not only sponsors' and viewers' dispositions but also the games' context while predicting sponsorship effectiveness.

The Run-of-Play and Visual Attention

The construct of attention has gained significant relevance in marketing and sponsorship research (e.g., Romaniuk & Nguyen, 2017). Visual attention is the allocation of an individual's processing capacities to stimuli in their visual field (Bundesen et al., 2005). However, sport viewers only pay attention to just a small share of information visible during broadcasts (d'Ydewalle & Tasmin, 1993). One explanation is the "spotlight" metaphor, which describes the attention mechanism as a spotlight that directs its focus only on selected objects in the viewer's visional field. These objects are processed more efficiently than nonselected ones (e.g., LaBerge, 1983). During TV broadcasts, in-stadium sponsor messages usually share the screen with the sporting content that the audience is most interested in. As a result, the sponsor information is generally processed as a peripheral signal rather than a central one (Breuer & Rumpf, 2015; Lee & Faber, 2007). This idea is in line with the limited capacity model of motivated mediated message processing (LC4MP) by Lang (2000). The model describes humans as organisms with finite levels of cognitive resources available at any moment in time. This framework suggests that viewers can only focus on a limited amount of in-stadium objects during broadcasts. Again, sponsor messages compete with the sporting content which holds the viewers' primary interest. Thus, different run-of-play characteristics might bundle a considerable amount of viewers' cognitive resources letting sponsor messages recede into the background. Therefore, the occurrence of different run-of-play characteristics on the field might affect viewers' attention allocation based on the LC4MP model. Those might draw viewers' full cognitive capacity for a certain amount of time solely to the game leading to reduced sponsor message recognition or the other way around if nothing is happening on the field. Thus, Research Question (RQ) 1 is formulated:

> **RQ1**: How do soccer game run-of-play characteristics influence viewers' visual attention allocation toward sponsor message alongside the field?

Suspense and Time Effects in Sponsorship Effectiveness Research

As the game's run-of-play is highly shaped by different run-of-play characteristics over a certain amount of time, the sum of those produces a game's final outcome. The uncertainty of sport games' outcome can produce high levels of suspense and is one unique

feature of the sports market (e.g., Knobloch-Westerwick et al., 2009; Madrigal et al., 2011). Thereby, the degree of suspense can evoke intense affective behavior within the viewers (Oshimi et al., 2014). Neuroscience literature already consented to the narrowing effect of suspense on visual attentional focus in the context of narrative films. The study of Bezdek et al. (2015) revealed that increasing narrative suspense reduces peripheral visual processing. In contrast, the sponsorship literature states almost exclusively an opposite effect: The games' degree of suspense influences the viewers' visual attention to sponsor messages significantly negative (e.g., Boronczyk et al., 2021; Breuer et al., 2021), indicating lower game suspense decreasing visual attention toward the peripheral perceived sponsor messages. To further extend the literature and elaborate on this contradictory effect, RQ2 is postulated:

> **RQ2**: How does the interaction with the games' degree of suspense change the influence of soccer games' run-of-play characteristics on viewers' visual attention to sponsor messages?

Based on the explanations above, the sum of all run-of-play characteristics produces the games' final outcome. However, soccer games are not infinite but are limited to the regular playing time of 90 min. After this time frame has passed, a final result will be determined with the utmost certainty. On this premise, a run-of-play characteristic that occurs toward the end of a game might attract the viewers' visual attention differently to one in the beginning, depending on their impact on the final score. Based on the explanations of the spotlight metaphor and the LC4MP model, run-of-play characteristics, which highly shape the final score, should be more distracting during the end of a soccer game drawing a considerable amount of cognitive resource allocation. In contrast, the beginning of a game might not bundle as many cognitive resources as the further run-of-play does. Furthermore, run-of-play characteristics, which do not highly shape the final score toward the end, could free cognitive resources for the visual attention allocation toward sponsor messages. Additionally to the conceptual framework, several studies already found significant associations between time effects and viewers' visual attention to sponsors. However, they did not analyze the influence of time in interaction with game-related determining factors of visual attention (e.g., Boronczyk et al., 2021; Breuer et al., 2021). Based on these explanations, RQ3 is formulized:

> **RQ3**: How does the interaction with time effects change the influence of soccer games' run-of-play characteristics on viewers' visual attention to sponsor messages?

Methodology

Study Design and Procedures

Conducting a controlled laboratory study, German Bundesliga live soccer games were utilized as stimuli and presented to highly involved soccer fans ($n = 42$). As the sport soccer holds an extraordinary reach and is consumed by massive TV audiences, it is the most popular sport for brands to sponsor (Nielsen Sports, 2018). All soccer games in the Bundesliga provide consistent and clear visible sponsor massages on LED boards around the field, which have to be available as standard across all Bundesliga stadiums based on the rules of the Deutsche Fußball Liga (DFL) (DFL, 2020). Targeting a study design, which should be realistic and comply with necessary scientific criteria, sponsor messages displayed on LED boards and cam carpets are of interest for this study. After a pretesting phase, data collection occurred during the season 2019/2020. Participants were sampled by convenience and highly involved with the team playing in the home stadium (i.e., fans of the home team) to ensure consistency. Table 1 summarizes relevant sociodemographic characteristics and summary statistics concerning participants' involvement. All participants were German. Two participants simultaneously watched the same soccer live broadcast in the exact setup (identical TV screens, biometric measures, armchairs, distance to screen, etc.). All participants provided written consent to the quasi-experiment following the university's ethical guidelines and reported normal or corrected to normal vision.

Measures

Visual Attention

Visual attention can be utilized through the widely acknowledged tool eye tracking, a biometric real-time measure to track viewers' eye movements on screens (Isaacowitz et al., 2006). Two remote infrared eye-tracking systems (SMI-RED, SensoMotoric Instruments) at 60Hz were used. Calibration with subsequent validation was performed for each participant. As results improve on a larger screen, where the deviation represents a smaller proportion compared to a smaller screen (SensoMotoric Instruments, 2011), two identical 43″-TV screens were utilized. All videos were analyzed through the BeGaze software developed by SensoMotoric Instruments. Areas of interest were marked for all sequences that provide clear visible sponsor messages on LED boards and cam carpets. These areas were matched with the participants' eye movement data to create the variable *gaze hits*: This indicates viewer's visual contact with sponsor messages and thus serves as

Table 1 Sociodemographic Characteristics and Involvement of the Participants

Variables	*M* (*SD*)	Description
Age	30.71 (6.24)	On average, participants were 31 years old.
Gender	—	In total, six participants were female (14.3%) and 36 were male (85.7%).
Family status	1.16 (0.37)	On average, participants are single/unmarried.
Education	4.61 (0.72)	On average, participants hold a general qualification for university entrance.
Income	3.05 (1.95)	On average, participants' monthly gross income is between 2,001€ and 3,000€.
Soccer fan involvement (Zaichkowsky, 1994)	5.89 (1.61)	7-point Likert scale with 10 items (1 = *strongly disagree*; . . . ; 7 = *strongly agree*); higher scores indicate higher levels of soccer involvement.
Team involvement (Wann & Branscombe, 1993)	6.71 (1.98)	8-point Likert scale with seven items (1 = *strongly disagree*; . . . ; 8 = *strongly agree*); higher scores indicate higher levels of team involvement.

valid measure of visual attention (Duchowski, 2007). Only fixations that last over 100 ms and data that exceed a tracking ratio of 80% were used.

The Run-of-Play

The run-of-play is highly shaped by different run-of-play characteristics occurring on the field over 90 min. In alignment with the frequency of occurrence and the commonly used live game statistics of the DFL (DFL, 2022), the games' run-of-play is utilized by two main sets of variables (common game situations, and ball possession and position situations, see Table 2). Within the first set of variables, the listed common game situations are recognized either as game situations of the home team (_home) or away team (_away). Furthermore, a third variable set is included as a considerable amount of time during live broadcasts, besides showing the current game, is spent on showing game replays of distinct common game situations. Thus, replays with clear visible sponsor messages were included. The final list of all run-of-play characteristic variables, divided into three sets, is presented in Table 2. All variables are dummy coded.

Suspense, Playing Time, and Control Variables

Game suspense can be reflected by the uncertainty of outcome of a game (e.g., Pawlowski et al., 2017). An objective measure and widely used indicator for game outcome uncertainty are betting odds (e.g., Forrest & Simmons, 2002; Weinbach et al., 2009). Bookmarkers track in-play betting odds as a real-time measure on a second-by-second basis (including a time stamp) for several soccer leagues. To utilize the data, the absolute distance between the winning odds of both teams (odds differential) was calculated, with small distances indicating higher degrees of game suspense (high outcome uncertainty) and large distances indicating lower degrees of game suspense (low outcome uncertainty). A square root transformation was conducted to receive the final variable $odds\ differential^{0.5}$, based on a curve-fitting procedure to test nonlinear relationships.

Table 2 Variable Sets Displaying the Live Games' Run-of-Play Characteristics

Variables	Explanation
Common game situations	
Kickoff	Start: Goal; end: Restart of the game
Goalkeeper-kick	Start: Ball out of play; end: Reception of the ball after goalkeeper-kick
Corner-kick	Start: Ball out of play; end: Reception of the ball after corner-kick
Free-kick	Start: Referee decision; end: Reception of the ball after free-kick
Throw-in	Start: Ball out of play; end: Reception of the ball after throw-in
Foul	Start: Misleading contact of two players; end: Referee decision
Injury	Start: Misleading contact of two players; end: Referee decision
Yellow or red card	Start: Referee decision; end: Restart of the game
Goal	Start: Ball over the touchline; end: Restart of the game
Goal-shoot	Start: The actual shoot, when the ball leaves the foot; end: Ball over the touchline or ball out of play
Change player	Start: Interruption of the game; end: Restart of the game
No game situation	All seconds, where no specific common game situation or replay occurs on the screen
Ball possession and position situations	
Ball out of play	Start: Ball out of play; end: Any action restarting the game
Ball possession	Ball possession of the home or away team
Field zone_1[a]	Ball is in Field zone 1
Field zone_2[a]	Ball is in Field zone 2
Field zone_3[a]	Ball is in Field zone 3
Field zone_4[a]	Ball is in Field zone 4
Field zone_5[a]	Ball is in Field zone 5
Field zone_6[a]	Ball is in Field zone 6
Replay situations	
Replays_total	Start: Broadcast of any replay; end: Ongoing game is broadcasted again
Replay_goal	Start: Broadcast of a goal replay; end: Ongoing game is broadcasted again
Replay_goal-shoot	Start: Broadcast of a goal-shoot replay; end: Ongoing game is broadcasted again
Replay_corner-kick	Start: Broadcast of a corner-kick replay; end: Ongoing game is broadcasted again
Replay_free-kick	Start: Broadcast of a free-kick replay; end: Ongoing game is broadcasted again
Replay_foul	Start: Broadcast of a foul replay; end: Ongoing game is broadcasted again
Replay_injury	Start: Broadcast of an injury replay; end: Ongoing game is broadcasted again
Replay_yellow or red card	Start: Broadcast of a yellow or red card replay; end: Ongoing game is broadcasted again

[a]The variables Field zone 1 to Field zone 6 each colors one sixth of the field. The home team is always attacking toward Field zone 1 (the area closest to the away teams goal), the away team always toward Field zone 6 (the area closest to the home team goal).

Potential game time effects are utilized based on soccer game's regular playing time of 90 min. To measure game progress, the metric variable *playing minute* (ranging from 1 to 90 min) was created following previous research (e.g., Breuer et al., 2021). Furthermore, the study controlled for participants' individual effects as biometric data were used (*participants*). To ensure sufficient involvement, participants' soccer and team involvement was assessed.

Data Analysis Procedures

Data Structure and Screening

To ensure valid data merging and synchronization, a software called Blickshift Recorder (Blickshift GmbH) was used (original frequencies: gaze hits [60 Hz], odds differnetial$^{0.5}$, and run-of-play characteristics [1 Hz]). The data were aggregated on a second-by-second basis and reduced to the regular playing time of 90 min to secure coherent and consistent assessment. This resulted in $n = 5{,}400$ possible observations per participant ($n = 42$ participants) and thus $n = 226{,}800$ observations in total. Specific attention was paid to screen the raw data prior to model estimation. Coding errors and missing data were deleted listwise. The analyses were performed with $n = 100{,}298$ observations as the visibility of sponsor message is indispensable, and only seconds including clear visibility were used.

Empirical Analysis

Generalized linear mixed models (GLMMs) were used for the analyses in IBM SPSS. Fixed and random effects were included to compensate for the violation of traditional regression's independence assumption when observations are clustered (Laird & Ware, 1982). GLMMs are typically estimated with maximum likelihood method. However, restricted maximum likelihood estimation was preferred to exclude downwardly biased estimates of the variance components and the fixed effect standard errors on the lower level, which would result in inflated Type I error rates (McNeish & Stapleton, 2016). This considers the degrees of freedom used for estimating the fixed effects to provide improved sample properties. Thus, Kenward–Rodger adjustment (McNeish & Stapleton, 2016) was used. To check for robustness, the residual method for larger sample sizes was tested. No differences in results were detected. Three sets of GLMMs, each holding 39 models, with the dependent binominal variable *gaze hits* were estimated with a logit function. Based on the literature and previous research, the study controlled for individual effects (*participants*, included as random effects). The three main categories of run-of-play variables (*common game situations, ball possession and position situations, and replay situations*), *odds differential*$^{0.5}$, *playing minute*, and the respective interaction terms in the second and third GLMM sets were included as fixed effects. Interaction effects portray conditions under which a relationship between two variables (i.e., the different independent variables and the variable gaze hits) is contingent upon the values of another variable (i.e., odds differential$^{0.5}$ and playing minute). In other words, the relationships between variables alter in strength and/or direction depending on the value of a third variable (Aguinis & Gottfredson, 2010).

Results

Participants were, on average, 31 years old (14.3% female and 85.7% male) and highly involved with soccer and one Bundesliga team. Overall, 4,596 gaze hits were detected. The variable *odds differential*$^{0.5}$ ranged from 0 to 22.36 ($M = 4.85$; $SD = 4.41$), and the variable *playing minute* from 1 to 90 min. Tables 3–5 present the analytical results and are arranged as follows: One row displays the result of one GLMM model, resulting in a total of 39 separate GLMM models depicted in each of the three tables. The bottom of the tables constitutes the information criteria for all models as a range. Displayed are only significant models indicating acceptable information criteria.

Visual Attention and the Run-of-Play

Table 3 displays the results of the first GLMM set, elaborating on the sole influence of the run-of-play characteristics on viewers' visual attention to sponsor messages. Twelve out of 22 common game situations are significantly associated with visual attention. Most of them negatively influence viewers' visual attention to sponsor messages, namely, goalkeeper-kick_home and goalkeeper-kick_away, corner-kick_home and corner-kick_away, throw-in_home and throw-in_home_away, foul_home and foul_away, injury_home, and change player. If these game situations occur during live games, viewers tend to spend less visual attention on sponsor messages. However, two of the game situations, goal_away and no common game situation happening, are positively associated, illustrating a significant increase in viewers' visual attention to sponsor messages during these seconds.

All predictors, except two, show a significant association with viewers' visual attention within the ball possession and position variable set. Ball out of play and Field zone_1 and Field zone_6 influence the outcome variable negatively, while ball possession_home and possession_away and Field zone_3 and Field zone_4 positively influence viewers' visual attention. The results indicate that viewers' visual attention decreases if the ball is out of play or near the goal of the teams (Field zone_1 and Field zone_6). In contrast, if the ball is in play, independent of which team possesses the ball, viewers' attention to sponsor messages increases. The same applies to game situations, which occur in the middle zones of the field (Field zone_3 and Field zone_4).

The analyses of broadcasted replays during the live games display a significant positive effect of replays_total on visual attention. Also, replay_goal, replay_goal-shoot, replay_corner-kick, replay_foul, and replay_injury are positively associated. None of the replays decrease the viewers' visual attention toward sponsor messages; independent of which replay, all significantly increase viewers' visual attention.

Across all models, the controls odds differential$^{0.5}$, playing minute, and the random effect participants are significantly associated with visual attention. Odds differential$^{0.5}$ displays a negative influence while playing minute is associated positively with visual attention. In expression, the more eased up a game is, the less viewers' attempts to spot sponsor messages, and the more game time has passed, the more viewers' visually spot sponsor messages.

The Interaction Effect of Suspense

The second set of GLMMs includes the interaction effect of the Run-of-Play Characteristics × Odds Differential$^{0.5}$, as displayed in Table 4. Eight interaction terms of the common game situations significantly affect viewers' visual attention. If those game situations occur compared to if they do not, the degree of suspense significantly impacts viewers' visual eye contact with sponsor messages around the field while interacting with the respective

Table 3 Results of the First Set of GLMMs

GLMM models Dependent variable: Gaze hits	Fixed effects			Random effects
	Variables named in Column 1 (*b*)	Odds differential$^{0.5}$ (*b*)	Playing minute (*b*)	Participants (covar.; *b*)
Common game situations				
Kick-off_home	6.838	–0.030***	0.005***	0.289***
Kick-off_away	6.945	–0.030***	0.005***	0.290***
Goalkeeper-kick_home	–0.891***	–0.031***	0.006***	0.290***
Goalkeeper-kick_away	–0.706***	–0.030***	0.006***	0.292***
Corner-kick_home	–0.966***	–0.030***	0.006***	0.291***
Corner-kick_away	–0.580***	–0.030***	0.005***	0.290***
Free-kick_home	0.135	–0.030***	0.005***	0.290***
Free-kick_away	0.012	–0.030***	0.005***	0.290***
Throw-in_home	–0.594***	–0.030***	0.005***	0.290***
Throw-in_away	–0.765***	–0.030***	0.005***	0.287***
Foul_home	–0.133*	–0.030***	0.005***	0.289***
Foul_away	–0.172**	–0.030***	0.006***	0.289***
Injury_home	–0.284*	–0.030***	0.005***	0.289***
Injury_away	0.120	–0.030***	0.005***	0.290***
Yellow or red card_home	0.210	–0.030***	0.005***	0.290***
Yellow or red card_away	0.131	–0.030***	0.005***	0.290***
Goal_home	0.041	–0.030***	0.005***	0.289***
Goal_away	0.771**	–0.030***	0.005***	0.289***
Goal-shoot_home	–0.125	–0.030***	0.005***	0.289***
Goal-shoot_away	0.073	–0.030***	0.005***	0.290***
Change player	–0.566***	–0.027***	0.006***	0.289***
No common game situation	0.728***	–0.031***	0.006***	0.290***
Ball possession and position situations				
Ball out of play	–0.446***	–0.031***	0.006***	0.295***
Ball possession_home	0.236***	–0.031***	0.006***	0.298***
Ball possession_away	0.161***	–0.031***	0.006***	0.296***
Field zone_1	–0.592***	–0.045***	0.006***	0.354***
Field zone_2	–0.002	–0.045***	0.006***	0.353***
Field zone_3	0.210***	–0.045***	0.006***	0.353***
Field zone_4	0.259	–0.045***	0.006***	0.351***
Field zone_5	0.071	–0.045***	0.006***	0.354***
Field zone_6	–0.486***	–0.046***	0.006***	0.348***
Replay situations				
Replays_total	0.951***	–0.029***	0.005***	0.297***
Replay_goal	0.870***	–0.029***	0.005***	0.288***
Replay_goal-shoot	1.369***	–0.030**	0.005***	0.292***
Replay_corner-kick	1.898*	–0.030***	0.005***	0.289***
Replay_free-kick	0.468	–0.030***	0.005***	0.289***
Replay_foul	1.644***	–0.030***	0.005***	0.293***
Replay_injury	1.298**	–0.030***	0.005***	0.290***
Replay_yellow or red card	7.233	–0.030***	0.005***	0.290***
Information criterion				
F (*p*)	Range across models: 15.535 ($p \leq .001$) to 77.699 ($p \leq .001$)			
Akaike corrected	Range across models: 786,862.15 to 1,147,520.96			
Bayesian	Range across models: 786,871.84 to 1,147,531.02			

Note. $n = 42$ with 100,298 observations; probability distribution: binomial; link function: logit; testing of fixed effects: residual method; information criteria: −2 log likelihood (models with smaller information criterion values fit better). GLMM = generalized linear mixed model.
*$p \leq .100$. **$p \leq .050$. ***$p \leq .010$.

Table 4 Results of the Second Set of GLMMs

GLMM models Dependent variable: Gaze hits	Fixed effects				Random effects
	Variables named in Column 1 (*b*)	Odds differential$^{0.5}$ (*b*)	Column 1 × Odds Differential$^{0.5}$ (*b*)	Playing minute (*b*)	Participants (covar.; *b*)
Common game situations					
Kick-off_home	7.531	–0.189	0.160	0.005***	0.289***
Kick-off_away	6.994	–0.042	0.012	0.005***	0.290***
Goalkeeper-kick_home	–0.835***	–0.041***	0.011	0.006***	0.291***
Goalkeeper-kick_away	–0.778***	–0.018	–0.013	0.006***	0.292***
Corner-kick_home	–0.778	–0.063***	0.035**	0.006***	0.288***
Corner-kick_away	–0.655***	–0.012	–0.018	0.005***	0.289***
Free-kick_home	–0.092	0.026	–0.056	0.005***	0.290***
Free-kick_away	–0.206	0.029	–0.060	0.005***	0.289***
Throw-in_home	–0.701***	–0.008	–0.023*	0.006***	0.290***
Throw-in_away	–0.599***	–0.058***	0.033***	0.005***	0.286***
Foul_home	–0.243**	–0.007	–0.024	0.005***	0.289***
Foul_away	–0.480***	0.034*	–0.068***	0.006***	0.289***
Injury_home	–0.894***	0.142**	–0.173***	0.006***	0.290***
Injury_away	0.613	–0.151*	0.121	0.006***	0.290***
Yellow or red card_home	–0.210	0.032	–0.064**	0.006***	0.291***
Yellow or red card_away	–0.542**	0.112**	–0.143***	0.005***	0.290***
Goal_home	0.022	–0.027	–0.003	0.005***	0.289***
Goal_away	0.798*	–0.036	0.006	0.005***	0.289***
Goal-shoot_home	–0.912***	0.175***	–0.206***	0.005***	0.289***
Goal-shoot_away	0.264	–0.068**	0.038	0.005***	0.289***
Change player	–0.751***	–0.009	–0.020	0.006***	0.290***
No common game situation	0.755***	–0.034***	0.006	0.006***	0.291***
Ball possession and position situations					
Ball out of play	–0.473***	–0.027***	–0.005	0.006***	0.295***
Ball possession_home	0.188***	–0.024***	–0.010	0.006***	0.298***
Ball possession_away	0.216***	–0.039***	0.012*	0.006***	0.296***
Field zone_1	–0.655***	–0.033**	–0.015	0.006***	0.355***
Field zone_2	0.140**	–0.068***	0.029**	0.006***	0.352***
Field zone_3	0.203***	–0.044***	–0.001	0.006***	0.353***
Field zone_4	0.236***	–0.041***	–0.005	0.006***	0.351***
Field zone_5	–0.061	–0.022*	–0.028**	0.006***	0.354***
Field zone_6	–0.396***	–0.062***	0.018	0.006***	0.348***
Replay situations					
Replays_total	0.720***	0.024	–0.054**	0.005***	0.297***
Replay_goal	0.746***	–0.004	–0.025	0.005***	0.288***
Replay_goal-shoot	1.429***	–0.041	0.012	0.005***	0.292***
Replay_corner-kick	6.418	–0.315	0.285	0.005***	0.289***
Replay_free-kick	–0.445	0.427	–0.457	0.005***	0.289***
Replay_foul	1.066***	0.156	–0.186	0.005***	0.293***
Replay_injury	0.947	0.119	–0.149	0.005***	0.290***
Replay_yellow or red card	7.233	–0.030***	0.000	0.005***	0.289***
Information criterion					
F (*p*)	Range across models: 11.273 ($p \leq .001$) to 70.569 ($p \leq .001$)				
Akaike corrected	Range across models: 788,002.14 to 1,148,531.21				
Bayesian	Range across models: 788,234.24 to 1,148,562.42				

Note. $n = 42$ with 100,298 observations; probability distribution: binomial; link function: logit; testing of fixed effects: residual method; information criteria: −2 log likelihood (models with smaller information criterion values fit better). GLMM = generalized linear mixed model.
*$p \leq .100$. **$p \leq .050$. ***$p \leq .010$.

Table 5 Results of the Third Set of GLMMs

GLMM models Dependent variable: Gaze hits	Fixed effects				Random effects
	Variables named in Column 1 (*b*)	Odds differential$^{0.5}$ (*b*)	Column 1 × Playing Minute (*b*)	Playing minute (*b*)	Participants (covar.; *b*)
Common game situations					
Kick-off_home	7.753	–0.030***	0.015	–0.009	0.289***
Kick-off_away	7.151	–0.030***	0.004	0.001	0.290***
Goalkeeper-kick_home	–0.489***	–0.031***	0.008***	–0.002	0.290***
Goalkeeper-kick_away	–0.515***	–0.030***	0.004	0.002	0.292***
Corner-kick_home	–0.801***	–0.030***	0.003	0.003	0.290***
Corner-kick_away	–0.387**	–0.030***	0.005	0.001	0.291***
Free-kick_home	–0.303	–0.030***	–0.012*	0.017**	0.289***
Free-kick_away	–0.691***	–0.030***	–0.018***	0.023***	0.289***
Throw-in_home	2.178***	–0.029***	0.003	0.003	0.290***
Throw-in_away	–0.667***	–0.029***	0.002	0.003*	0.287***
Foul_home	–0.407***	–0.030***	–0.066**	0.012***	0.288***
Foul_away	–0.528***	–0.030***	–0.008***	0.013***	0.288***
Injury_home	1.578***	–0.032***	0.036***	–0.030***	0.289***
Injury_away	–0.066	–0.030***	–0.004	0.009	0.290***
Yellow or red card_home	–0.662	–0.031***	–0.014**	0.020***	0.290***
Yellow or red card_away	–0.182	–0.030***	–0.006	0.011	0.290***
Goal_home	–0.527	–0.030***	–0.011	0.017	0.290***
Goal_away	1.680**	–0.030***	0.017	–0.011	0.289***
Goal-shoot_home	–0.713**	–0.030***	–0.013**	0.019***	0.290***
Goal-shoot_away	0.745*	–0.030***	0.013**	–0.008	0.289***
Change player	0.019	–0.027***	0.008	–0.002	0.289***
No common game situation	0.559***	–0.030***	–0.004***	0.009***	0.290***
Ball possession and position situations					
Ball out of play	–0.261***	–0.030***	0.004***	0.003***	0.294***
Ball possession_home	0.092	–0.031***	–0.003**	0.008***	0.299***
Ball possession_away	0.083	–0.030***	–0.002	0.007***	0.295***
Field zone_1	–0.837***	–0.045***	–0.006**	0.011***	0.354***
Field zone_2	0.221**	–0.045***	0.002	0.006***	0.353***
Field zone_3	0.226**	–0.045***	0.000	0.006***	0.353***
Field zone_4	0.353***	–0.045***	0.002	0.004**	0.350***
Field zone_5	–0.346***	–0.044***	–0.010***	0.014***	0.355***
Field zone_6	–0.252*	–0.046***	0.005**	0.002	0.348***
Replay situations					
Replays_total	1.082***	–0.029***	0.003	0.002	0.297***
Replay_goal	2.924***	–0.029***	0.035***	–0.030***	0.287***
Replay_goal-shoot	0.735**	–0.030***	–0.014**	0.019**	0.292***
Replay_corner-kick	10.404	–0.030***	0.111	–0.105	0.289***
Replay_free-kick	6.660**	–0.030***	0.095***	–0.090**	0.289***
Replay_foul	0.769*	–0.029***	–0.025**	0.031***	0.293***
Replay_injury	–0.770	–0.030***	–0.097*	0.103*	0.290***
Replay_yellow or red card	7.233	–0.030***	0.000	0.005***	0.289***
Information criterion					
F (*p*)	Range across models: 17.463 ($p \leq .001$) to 79.239 ($p \leq .001$)				
Akaike corrected	Range across models: 796,263.35 to 1,149,910.35				
Bayesian	Range across models: 796,452.41 to 1,149,961.52				

Note. $n = 42$ with 100,298 observations; probability distribution: binomial; link function: logit; testing of fixed effects: residual method; information criteria: −2 log likelihood (models with smaller information criterion values fit better). GLMM = generalized linear mixed model.
*$p \leq .100$. **$p \leq .050$. ***$p \leq .010$.

game situation. The interaction of corner-kick_home and throw-in_away with odds differential$^{0.5}$ positively impacts viewers' visual attention toward sponsor messages. During a more eased-up game, the occurrence of those common game situations leads to an increase in viewers' visual attention. In contrast, the occurrence of throw-in_home, foul_away, injury_home, yellow or red card_home and yellow or red card_away, and goal-shoot_home with odds differential$^{0.5}$ decreases viewers' visual attention during more eased-up games.

Concerning ball possession and position, three interaction terms significantly affect visual attention. Ball possession_away and Field zone_2 show in the interaction with odds differential$^{0.5}$ a positive association with viewers' visual attention. The less a game's degree of suspense, the more viewers tend to spot sponsor messages during these situations occur. Field Zone_5 × Odds Differential$^{0.5}$ displays an opposite association with visual attention. A more eased-up game leads to less visual attention to sponsor messages.

In the last set of variables, only replays_total significantly negatively influences visual attention when interacting. The interaction with odds differential$^{0.5}$ decreases the viewers' attention to sponsor messages indicating, if a replay occurs in contrast to if it does not, the less suspenseful a game is, the less viewers tend to spot sponsor messages. With the second set of GLMMs, the controls display similar results than in the first set of GLMMs.

The Interaction Effect of Playing Time

Within the third set of GLMMs, the interaction effect of the Run-of-Play Characteristics × Playing Minute was tested (Table 5). Ten interaction terms of the common game situations significantly affect viewers' visual attention, indicating that the influence of those situations on visual attention is affected by playing time. The interaction of goalkeeper-kick_home, injury_home, and goal-shoot_away with playing minutes is positively related to viewers' visual attention. If these game situations occur in contrast to if they do not, a higher game time is associated with an increase of viewers' visual attention to sponsor messages. In contrast, if free-kick_home and free-kick_away, foul_home and foul_away, yellow or red card_home, goal-shoot_home, and no common game situation occur, the more a game is advanced in time, the less the viewers tend to spot sponsor messages. In expression, those game situations show a negative association with visual attention in interaction with playing minute.

Concerning ball possession and position, only Ball Out of Play × Playing Minute significantly positively influences visual attention. Ball possession_home and Field zone_1, Field zone_5, and Field zone_6 decrease visual attention when interacting with playing minute. If the ball is out of play instead of in play, the more a game has progressed, the more attention to sponsor messages is devoted by the viewers. If the other situations occur instead of if they do not, the more game time has passed, the less visual attention to sponsor messages is present.

The last set of run-of-play characteristics shows two significant positive and three significant negative effects on visual attention in interaction with playing minute. If replay_goal or replay_free-kick occurs in contrast to if they do not, the more game time has passed, the more visual attention is devoted to sponsor messages. However, if a replay shows a goal-shoot, a foul, or an injury, a more timely passed game decreases the viewers' attention to sponsor messages. All control variables are stable and display similar results to the first and second set of GLMMs.

Discussion

Targeting a more effective evaluation of sponsorships, this study uses visual attention as a consumer outcome measure to outline the impact of different run-of-play characteristics on viewers' visual attention allocation to sponsor messages around the field. Findings emphasize the importance of using real-time playable in-stadium LED boards more effectively for sponsor message placement and personalization depending on the sporting action itself, the degree of suspense it creates, and the playing time has passed. The study's sample size considerably exceeds previous research on game-related influencers of sponsorship effectiveness in terms of observation and participant numbers (e.g., Boronczyk et al., 2021; Le Roy & Vivier, 2008). Additionally, real-time stimuli (live broadcasts) and measures are used, which follow the calls for action of several authors (e.g., Jensen & White, 2018; Lee et al., 2019).

Across the three sets of GLMMs, the most significant effects were found in the first set, indicating that the sporting action itself, independently of the games' degree of suspense or time effects, strongly influences viewers' visual attention allocation to sponsor messages. Common game situations, ball position and possession, and replays show significant associations with viewers' visual attention allocation likewise. As most of the common game situations seem to attract the viewers' attentional focus centrally, sponsor messages disappear into the background during the occurrence of these run-of-play characteristics. This is in line with the theoretical predictions of the LC4MP model (Lang, 2000), limiting the cognitive capacity of viewers to sporting content. Only goal_away is associated positively. Cam carpets, which are placed directly in the visional field of the goals, might be an explanation.

Additionally, the time slots where no common game situation occurs increase the visual attention, which is in line with the findings of Le Roy and Vivier (2008). This is supported by ball possession, independently of which team, increasing visual attention. Furthermore, if the ball is in Field zone_3 and Field zone_4, also more visual eye contact to sponsor messages was found. Both findings indicate that run-of-play characteristics, which refer to a game flow like back-and-forth passing, passing in the middle field, moving to one goal, and so forth, might be beneficial for visual attention to sponsor messages. The same applies to broadcasted replays during the game (strongest influencer of all run-of-play characteristics). The viewers seem already familiar with the broadcasted game situation streamed within the replay and might have more cognitive resources available to denote to sponsor messages within these seconds (LaBerge, 1983; Lang, 2000). The game's degree of suspense is negatively associated with the visual attention allocation to sponsor messages, in line with findings from advertising research (Bee & Madrigal, 2012; Oshimi et al., 2014). However, this is contrasting to neuroscience literature (Bezdek et al., 2015). Suspenseful time frames seem to capture more cognitive capacity toward the broadcast, which also benefits the visual processing of sponsor messages during games. If the outcome of games gets more predictable, viewers might lose interest. This could be drawn backward to specific characteristics of the sports industry instead of other marketing areas.

Referring to the interaction effects with the games' degree of suspense and time, the GLMM set elaborating on the interactions with time shows slightly more significant associations with visual attention than the interaction with suspense. However, three influencers are affected by the interaction with suspense showing crucial changes in their relationship with visual attention to sponsor messages: Corner-kick_home gets positive association with

viewers' visual attention in more eased-up games, Field zone_2 seems to be valuable in eased-up games, and replays decrease the visual attention toward sponsor message the more eased up a game is. Concerning time effects, in all three sets of variables' substantial changes could be observed. Within the common game situations, the interaction effects of goalkeeper-kick_home, injury_home, and goal-shoot_away show positive associations with more passed game time, while the seconds where no common game situation occurs negatively influence the visual attention the more game time has passed. This goes along with the findings of odds differential depicting that less suspenseful games negatively influence viewers' attention to sponsor messages. If no game situation is broadcasted, the more game time has passed, and the less visual attention is placed on sponsor messages, eventually because of less attraction of the game for viewers. Also, the LC4MP model postulates that game situations which highly shape the final score should be more distracting during the end of games, going along with goal-shoot_home and free-kick_home and free-kick_away to be negatively associated with visual attention in combination with the playing time.

Additionally, the variables ball out of play and ball possession_home change in the interaction with time. Field zone_6 seems to attract viewers' visual attention to sponsor messages as more time has passed, supporting the assumption that eased-up passing situations without any common game situation might be valuable for sponsors to place their message. The replay situations within the broadcasts also show a significant association with visual attention in interaction with time. Three replays in specific decrease the visual attention to sponsor messages, the more game time has passed: replay_corner-kick, replay_foul, and replay_injury, which might result based on less attraction of the game with more game time passed.

Contribution and Implications

The findings of this study confirm the predictions of the LC4MP model in the context of sponsorship evaluation, suggesting an application to other sponsorship outcome measures in future studies. Furthermore, improved measurements are used in this study, showing similar results than previous studies already indicated, however, never elaborated in a holistic and detailed manner before: The game itself is significantly associated with consumers' visual attention and thus effective sponsorship evaluation. Thus, the determinants of sponsorship evaluation concerning broadcasted sponsor messages, which are present in the literature at the moment, should be extended by game-related factors. Results show that the sporting action itself has more influence concerning effective consumer message processing than literature suggested so far.

As this study solely concentrates on the first step and thus only one evaluation form of measuring the influence of the game on sponsorship effectiveness step (i.e., measuring solely visual attention as this is the first necessary step for any further cognitive processing), this study contributes to the literature by setting the groundwork for further research: other outcome measures, which follow visual attention after information has been cognitively processed (i.e., brand awareness, image, and purchase intention), should be targeted in the following steps based on different sponsorship objectives following the O'Reilly and Madill's (2012) process model.

Additionally, this research extends the literature by demonstrating a highly realistic quasi-experimental setup, answering the call of action from various authors concerning more reliability of sponsorship evaluation research. Only two other studies (i.e., Boronczyk et al., 2021; Breuer et al., 2021) were found using full-length and live sports broadcasts combined with biometric measurements. By doing so, this study enhances existing academic approaches attempting to measure sponsorships more effectively and bridges the gap to practice simultaneously. The results provide a starting point to evaluate sponsorships even without direct references to consumers (as the industry needs consistent evaluation tools, which academics rarely brought up before; O'Reilly & Madill, 2012): In play game, information is tracked by most soccer clubs anyway. The data of this study merged those game information with consumer outcome information, allowing to develop an artificial intelligence in the future, which predicts consumers' visual attention based on the game information. Therefore, sponsors could use the data of soccer clubs to evaluate their sponsorships based on an artificial intelligence model.

This suggestion leads to the last contribution of this study's results. It enlarges existing literature based on providing relevant information to sponsors and clubs to negotiate their pricing, which was claimed to be missing by Cornwell and Kwon (2020). Through the reliable and realistic approach, findings demonstrate when consumers devote less or more visual attention to the sponsor messages in reference to game-relevant situations. As previous research already indicated, viewers mostly pay attention to the sporting action itself instead of sponsor messages around the field (Breuer & Rumpf, 2015; Lee & Faber, 2007), which raises the question toward valuable sequences for sponsors.

Consequently, message personalization during broadcasts can be executed more effectively based on findings regarding prior sponsorship evaluation. More dynamic management and timing of sponsor messages with the following managerial implications could be precious for sponsors and sport managers. Valuable time periods and associations that generate an above-average return on investment and could therefore reasonably be priced differently are as follows:

- Time slots where no common game situation occurs during broadcasts, for example, passing (back and forth), holding of the ball possession (independently of which team), no attacking play situations, and so forth.
- Time slots with those seconds of the run-of-play, which do not include negative associated game situations and ball possession/position situations, for example, kickoffs, free-kicks, foul and injury situations, and passing in the middle field.
- Broadcasted replays (all kinds) of previous game situations are an additional valuable time slot for sponsors, which could be used more efficiently.
- Sponsor message during the end of games is valuable, however, not during suspenseful game situations.
- Sponsor message on cam carpets behind the goals and generally in more suspenseful games seems more valuable.

Limitations and Future Research

The shortcomings of this study are reflected in the following indicating future research directions. First, to enhance predictive power, future studies should add sponsor- and viewer-related factors to the analysis, targeting a holistic study approach to sponsorship effectiveness and going along with the indicated significant interindividual differences (random effects) in the GLMMs. Second, machine learning could be a helpful method in the future as some of the effects are pretty small. A dynamic pricing model for

placing sponsorship messages could be developed in a subsequent step. Machine learning-driven algorithms might detect further adequate time periods for sponsors going beyond this study's purpose. Third, future research might target even higher sample sizes to account for further cognitive processing of the sponsor message within the participants, for example, elaborating on the influence of game-related factors on brand recall and recognition after the visual eye contact. Besides attention measures, using effectiveness measures of engagement objective and other outcomes should be taken into account concerning sponsorship evaluation. As sponsorship-linked marketing experience transformation over time, using appropriate outcome measures and new approaches is emphasized. At last, the underlying results of this study can be used to launch further research in the field of below-the-line marketing communication measures. Likewise, run-of-play characteristics in sport, for example, visual attention for product placement in movies, might be affected by distinct movie sequences, which potentially foster or harm sponsorship effectiveness.

Conclusions

This article elaborates on the influence of sports games' run-of-plays on viewers' visual attention to sponsor messages during live broadcasts (RQ1). Furthermore, the interaction effect of the games' degree of suspense (RQ2) and playing time (RQ3) within this relationship is analyzed. This study is the first to examine the effects of distinct run-of-play characteristics on sponsorship effectiveness. Following the call for more reliable measures, results based on a real-time adoption approach can give advice on broadcast-embedded message placement and personalization. Findings contribute to the existing literature by confirming the assumptions of the LC4MP model and postulating game-relevant information as determinants concerning effective sponsorship evaluation. Furthermore, the results enlarge previous literature on sponsorship pricing and negotiation. Sport marketing managers and sponsors gain valuable insights on more effectively placing sponsor messages within live sport games. Viewers' visual attention to sponsor messages could be increased, and a more dynamic and efficient pricing model of sponsor messages comes upon question for the future.

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