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**Sponsorship effectiveness and message  
placement in live broadcasts: Assessing the  
influence of sport-specific factors and state of  
the art research approaches**

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Affidavits following §7 section 2 No. 4 and 5 of the doctoral regulations from the German Sport University Cologne, February 20<sup>th</sup> 2013:

Hereby I declare:

The work presented in this thesis is the original work of the author except where acknowledged in the text. This material has not been submitted either in whole or in part for a degree at this or any other institution. Those parts or single sentences, which have been taken verbatim from other sources, are identified as citations.

I further declare that I complied with the actual “guidelines of qualified scientific work” of the German Sport University Cologne.

26.06.2024,

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Date, Signature

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**Contents**

<b>Contents .....</b>	<b>iii</b>
<b>List of Abbreviations .....</b>	<b>iv</b>
<b>1 Introduction.....</b>	<b>1</b>
1.1 Background and relevance.....	1
1.2 Research questions.....	5
1.3 Theoretical background and concepts .....	6
1.3.1 Multi-sided markets .....	6
1.3.2 Visual attention as outcome measure of sponsorship effectiveness .....	7
1.3.3 The limited capacity model of mediated message processing.....	9
1.4 Outline and contribution of each study.....	11
1.4.1 Study I: The impact of in-stadium spectators.....	12
1.4.2 Study II: The impact of the game.....	14
1.4.3 Study III: Closing the gap between academics and practice .....	15
1.5 References.....	18
<b>2 The impact of in-stadium spectators.....</b>	<b>26</b>
<b>3 The impact of the game .....</b>	<b>27</b>
<b>4 Closing the gap between academics and practice .....</b>	<b>28</b>
<b>5 Conclusion and outlook .....</b>	<b>29</b>
5.1 Major findings and implications .....	29
5.2 Avenues for future research.....	32
5.3 References.....	34
<b>Abstract.....</b>	<b>36</b>
<b>Kurzfassung.....</b>	<b>37</b>

**List of Abbreviations**

<b>AI</b>	Artificial intelligence
<b>ARV</b>	Average rectified value
<b>AOI(s)</b>	Area of interests
<b>BMP</b>	Heartbeats-per-minute
<b>DFL</b>	Deutsche Fußball Liga
<b>DV</b>	Dependent variable
<b>EMG</b>	Electromyography
<b>GLMM</b>	Generalized linear mixed model
<b>GSR</b>	Galvanic skin response
<b>H</b>	Hypothesis
<b>HR</b>	Heart rate
<b>Hz</b>	Hertz
<b>IBM</b>	International Business Machines
<b>IV</b>	Independent variable
<b>LED</b>	Light emitting diode
<b>LC4MP</b>	Limited capacity model of motivated mediated message processing
<b>M</b>	Mean value
<b>MDI</b>	Mean decrease in Gini
<b>Min</b>	Minute
<b>ML</b>	Machine learning
<b>Ms</b>	Milliseconds
<b>Mtry</b>	The optimal number of features sampled for each tree
<b>n</b>	Sample
<b>ntrees</b>	The optimal number of trees
<b>OOB</b>	Out-of-bag
<b>ROC</b>	Receiver operating characteristics
<b>ROI</b>	Return on investment
<b>ROO</b>	Return on objectives
<b>RQ</b>	Research question
<b>SD</b>	Standard deviation
<b>SMI</b>	SensoMotoric Instruments
<b>RED</b>	Infrared
<b>SMOTE</b>	Synthetic minority over-sampling technique

<b>SPSS</b>	Statistical package for social science
<b>SVM</b>	Support vector machine
<b>TV</b>	Television
<b>XGBoost</b>	Extreme gradient boosting

# 1 Introduction

## 1.1 Background and relevance

Despite the significant growth of sport sponsorship and attention research in general, sport sponsorship evaluation continues to be an object of debate within this literature (e.g., Jensen, 2023; Jensen & White, 2018; Koronios et al., 2023; Krauzlis et al., 2023; Meenaghan, 2013; Moore & Zirnsak, 2017). Sponsorship can be defined as “the provision of assistance either financial or in-kind to an activity by a commercial organization for the purpose of achieving commercial objectives” (Meenaghan, 1983, p. 8). Meanwhile, sport sponsorship is an established below-the-line marketing instrument across a myriad of industry segments used to gain different benefits and thus serve a broad range of objectives, such as raising awareness, building brand image, or customer engagement (e.g., Cornwell, 2020; Meenaghan, 2013). Furthermore, sport sponsorships are often characterized by a lack of rigid structures in terms of sponsorship contracts, price negotiations, and evaluation (e.g., Cornwell & Kwon, 2020; Kim et al., 2015; Wishart et al., 2012). Consequently, it is challenging to offer a universal solution for companies to evaluate their sponsorships and customized approaches are needed (e.g., Alonso Dos Santos et al., 2018; Jensen & White, 2018).

One pivotal tool used by companies to reach their desired objectives within their sport sponsorships is message placement in dynamic mediated content, such as in-stadium sponsor message placement during sport live broadcasts (e.g., Cornwell, 2020; Rumpf et al., 2020). This form of sponsorship activation includes, amongst others, clearly visible messages around the pitch (e.g., LED-boards) and behind the goal (e.g., cam carpets concerning soccer) during the broadcasts (e.g., Rumpf & Breuer, 2017). Moving away from mass communication towards integrated communication, sponsor messages are displayed – similar to product placement in movies – as part of the programming, sharing and costumer experience within sport broadcasts (e.g., Cornwell, 2020; Navarro et al., 2009). However, in line with the ongoing debate of sponsorship evaluation, the effectiveness of mediated message processing, and thus in-stadium message placement, presents a unique challenge and is repeatedly questioned (Cornwell, 2014; Cornwell & Kwon, 2020). During sport live broadcasts, the in-stadium messages share the screen with the media content that holds the audience’s primary interest. Thus, sponsor

messages are typically processed by viewers as peripheral signals rather than central ones (Breuer & Rumpf, 2015; Lee & Faber, 2007). Furthermore, sponsors operate in an environment saturated with sponsor messages, which sometimes lead to cluttered stadiums that feature numerous logos and various advertising messages increasing the competition for consumers' attention (e.g., Boronczyk et al., 2018; Cianfrone, 2018; Donlan, 2014; Kitchen et al., 2004). Additionally, consumers frequently attempt to avoid commercial stimuli, such as sponsor messages displayed in live broadcasts (Milosavljevic & Cerf, 2008).

However, particularly in sports, major sponsorship deals are associated with substantial financial investments from companies, which results in a need for timely and appropriate sponsorship evaluation to justify the investment and maximize the benefit (Jensen et al., 2021; Jensen & White, 2018; Kim et al., 2015). Appropriate evaluation is crucial as it enables companies to optimize their in-stadium message placement, and thus increase their sponsorship effectiveness (e.g., Cornwell, 2020; Kim et al., 2015). Both, academics and practitioners alike advocate the need for advanced sponsorship evaluation, calling for more reliable measures of sponsorship effectiveness (Alonso Dos Santos et al., 2018; Jensen & White, 2018; Kim et al., 2015; Meenaghan, 2013). Furthermore, digitalization, encompassing technical innovations like artificial intelligence (AI), and rapidly changing conditions for sponsors, result in a growing number of factors influencing in-stadium message- and overall sponsorship effectiveness (e.g., Breuer et al., 2021; Rumpf & Breuer, 2017).

Previous studies used various outcome measures to assess sponsorship effectiveness, such as brand awareness, brand image, preferences, purchase intention, or (visual) attention (Kim et al., 2015; Cornwell, 2020). The majority entails consumers' response measures. Those can be structured in three dimensions, namely cognitive, affective, and conative consumers' responses (Alonso Dos Santos et al., 2018; Kim et al., 2018). The first dimension, cognitive, includes (visual) attention as an outcome measure (Alonso dos Santos et al., 2018; Moore & Zirnsak, 2017). This measure is fundamental as other outcome measures solely come forth if sponsor messages have been visually attended prior (e.g., Breuer & Rumpf, 2012; Lardinoit & Derbaix, 2001). To process sponsorship information, the first step necessary for humans is the visual eye-contact with sponsor messages (Lamme, 2003). Additionally, the influence of attention on downstream outcomes



has been widely recognized (e.g., Casado-Aranda et al., 2020; Orquin & Wedel, 2020). By analyzing consumer gaze behavior, sponsorship effectiveness can be assessed according to the visual attention consumers allocate to in-stadium messages within sports live broadcasts. Recently, there has been an increase in neuroscientific studies in the field of sponsorship effectiveness in mediated content and attention research (e.g., Alonso dos Santos et al., 2018; Lee et al., 2019; Rumpf et al., 2020), employing advanced methodologies. To further enhance the understanding of sponsorship evaluation, the current study makes use of neuroscientific measurements and employs visual attention as outcome measure of sponsorship effectiveness within soccer live broadcasts.

Turning to factors which significantly influence sponsorship effectiveness and drive consumers' attention to in-stadium message placement, determinants – revealed in the literature so far – can be categorized into four main areas (e.g., Boronczyk et al., 2022; Cornwell, 2019; Cornwell, 2020; Kim et al., 2015): sponsor-related factors (e.g., leverage, exposure, color, movement); dyadic factors (e.g., fit, congruence); sponsee-related factors (e.g., prestige, image); and consumer-related factors (e.g., knowledge, awareness, involvement). However, the central element that justifies the existence of major sport clubs has been mainly overlooked so far: the game itself, surrounded by thousands of in-stadium spectators. Emotionalized sport games are the primary product offered by sports clubs, which act as multi-sided markets around this 'sport-specific' core element (e.g., Budzinski & Satzer, 2011; Doidge et al., 2020; Rumpf et al., 2015; Singleton et al., 2020). In contrast to the peripheral nature of sponsor messages displayed during live broadcasts, the sport game is the core element, which the consumers are most interested in (e.g., Breuer & Rumpf, 2015). Additionally, in-stadium spectators have long been an essential component in sports, enhancing the experience character of the match and creating atmosphere during live broadcasts (e.g., Behrens & Urich, 2022; Budzinski & Satzer, 2011). Surprisingly, both 'sport-specific' factors have received limited attention in literature concerning sponsorship effectiveness. Due to digitalization and technological enhancement (e.g., LED-boards, digital overlays, real-time adaption), these two factors, however, have become more relevant during the last years (e.g., Rumpf & Breuer, 2017). Thus, this thesis conceptualizes in-stadium spectators and the game as potential

‘sport-specific’ factors that might influence sponsorship effectiveness within dynamic mediated message processing during sport broadcasts.

By now, no study was found elaborating on the influence of in-stadium spectators on sponsorship effectiveness. Recent literature researching in-stadium spectators concentrated, for example, on their contribution to atmosphere building, their responses to technological innovations, or next-generation stadium experiences (e.g., Behrens & Uhrich, 2022; Glebova et al., 2019; Uhlendorf & Uhrich, 2022); however, neglected their potential influence on sponsorship effectiveness within mediated sport-specific content. Concerning the sport games’ influence on sponsorship effectiveness, five relevant studies have been identified by now (Boronczyk et al., 2022; Breuer et al. 2021; Le Roy & Vivier, 2008; Lee et al., 2019; Rumpf et al., 2015). All studies shed light on only single aspects of the game (e.g., intensity, ball movement, penalties) and examined a relatively small sample size. Their approaches further included the utilization of sequenced video clips displaying past broadcasts and self-reported questionnaires, among others. Systematic research on the influence of in-stadium spectators and the game (sport-specific factors) on sponsorship effectiveness in mediated content is absent.

This diverges from the demand in scientific research for enhanced measurement of sponsorship effectiveness using real-time evaluation, more profound knowledge for sponsorship price negotiations, and the call for more realistic study designs (e.g., Cornwell, 2019; Cornwell & Kwon, 2020; Jensen & White, 2018; Lee et al., 2019; Meenaghan, 2013; Vlačić et al., 2021). Additionally, researchers claim a missing connection between academia and practice, as findings of studies are often not transferable to practical contexts and are frequently derived from potentially biased laboratory settings utilizing data that is unavailable to companies in real-world scenarios (e.g., Jensen & White, 2018; O’Reilly & Madill, 2012; Vlačić et al., 2021; Volkmar et al., 2022). The industry needs feasible, reliable, and up-to-date evaluation tools based on solid academic findings, which have rarely been brought up so far. Examining ‘sport-specific’ factors as potential sponsorship effectiveness drivers within soccer live broadcasts, which are tracked by most soccer clubs anyway, could provide a starting point towards bridging this gap.

## 1.2 Research questions

Against this backdrop, the first aim of this study is to enhance the scientific and applied understanding of sponsorship effectiveness in live broadcasts by investigating the influence of two sport-specific factors that might affect consumers' visual attention allocation towards sponsor messages: in-stadium spectators and the sport game itself. Both factors are under-researched and might leave consumers with varying amounts of attentional capacity for the processing of peripheral sponsor message information and thus hold significant importance for optimized message placement. The limited capacity model for motivated mediated message processing (LC4MP) conceptualizes consumers as biological organisms with finite cognitive resources for allocating visual attention towards marketing stimuli in mediated content (Lang, 2000, 2006). In-stadium spectators and the game gather a substantial amount of consumers' attentional resources, leaving only finite levels for attention allocation towards sponsor messages. To determine whether in-stadium spectators and the game are significant influencing factors for sponsorship effectiveness and whether they can contribute to optimized message placement in live broadcasts, the following two research questions are going to be answered primarily:

**RQ 1:** *How do in-stadium spectators influence consumers' attention to sponsor messages and thus sponsorship effectiveness in live broadcasts?*

**RQ 2:** *How does the game influence consumers' attention to sponsor messages and thus sponsorship effectiveness in live broadcasts?*

Additionally, this research should address the presented knowledge gap between academic findings and practical application of companies concerned with sponsorship effectiveness and sponsor message optimization in live broadcasts. To provide profound knowledge to practitioners and enhance sponsorship effectiveness in practical settings, a third research question is going to be addressed throughout this thesis:

**RQ 3:** *How to align academic findings with applied practical settings in the given context?*

### **1.3 Theoretical background and concepts**

The underlying main theories and concepts of this thesis are the concept of multi-sided markets, the concept of visual attention as outcome measure of sponsorship effectiveness, and the limited capacity model of motivated mediated message processing. The following chapter displays the theories and concepts reinforced by relevant literature. However, a coherent literature review has not been included as it is incorporated in the chapters 3 to 5 for each context in detail.

#### ***1.3.1 Multi-sided markets***

The concept of multi-sided markets, also often referred to as multi-sided platforms or theory of multi-sided markets/platforms (e.g., Budzinski & Satzer, 2011; Evans, 2011; Sanchez-Cartas & Leon, 2021), emerged around 2000 (e.g., Evans, 2003a, 2003b; Parker & Van Alstyne, 2000). By now, research states that there is no widely accepted definition of the concept and it is rather about identifying multi-sided markets, when someone conceptualizes them as such (e.g., Rochet & Tirole, 2006; Sanchez-Cartas & Leon, 2021). In broader terms, a multi-sided market necessitates three aspects (Evans, 2003a; Evans & Schmalensee, 2007): (1) the presence of a minimum of two distinct customer groups (clearly distinguishable); (2) the indirect connection of these groups through externalities, so called network externalities or effects; and (3) the internalization of these externalities created by one group for the other group by an intermediary. In contrast to the term 'platform', which mostly refers to different markets acting independently on the platform 'company' (Evan, 2016), the term 'multi-sided markets' describes a company acting as a platform and selling different products to different customer groups with interdependency (Evan, 2003a; Evans, 2003b). The network effects mentioned in the second assumption of multi-sided markets comprise direct and indirect network externalities, which can be both positive and negative for the different customer groups (Caillaud & Jullien, 2003; Farrell & Saloner, 1985; Katz & Shapiro, 1986; Rochet & Tirole, 2006). Meanwhile, the concept of multi-sided markets has been applied to several different industries and markets (e.g., Armstrong, 2007; Evans & Schmalensee, 2007). However, it took nearly a decade until the concept was first applied to professional sport clubs (e.g., Bae & Kwon, 2008; Budzinski & Satzer, 2009; Hartwich, 2007; Wicker et al., 2012).

When conceptualizing professional sport clubs as multi-sided markets, several distinct customer groups emerge as proposed for example by Budzinski and

Satzer (2011) or Zheng and Mason (2018). Both papers include, amongst others, three distinct groups, which were also outlined by Budzinski and Pawlowski (2014) and that are relevant for this thesis: spectators, broadcasters, and sponsors. Spectators buy tickets to attend in-stadium games, whereas broadcasters pay substantial fees to sell subscriptions to TV consumers and slots for advertising messages in live broadcasts to companies (Barros et al., 2007; Deloitte, 2022). Sponsors in turn hope to emotionally enrich and popularize their brands by placing in-stadium messages (Desarbo & Madrigal, 2011; Lee et al., 2019), which goes along with high investments in sport sponsorship deals (O'Reilly & Madill, 2012). All groups can be distinguished from each other and are inter-correlated by the exemplified externalities (Evans, 2003b). These externalities can be differentiated in same-side network externalities, occurring within one group on a platform (e.g., in-stadium spectators and TV consumers), and cross-side network externalities, affecting different groups (e.g., in-stadium spectators and sponsors). Research on professional sport clubs as a multi-sided market has already identified both forms of externalities (Budzinski & Satzer, 2011; Dietl & Duschl, 2012; Eisenmann et al., 2006). The sport game itself provides the reason for the platforms existence.

Although the concept takes an economic perspective, it is also used in the broad field of management (e.g., Hagiu & Wright, 2015; Holzmann et al., 2014). In this dissertation, the concept of multi-sided market platforms is employed to analyze the effectiveness of sponsor message placement by investigating underlying direct network effects between the presence/absence of in-stadium spectators and TV consumers' visual attention allocation to sponsor messages. A direct network effect is assumed to be present, if there is a significant influence of in-stadium spectators on TV consumers' visual attention (same-side network externality). Additionally, also an indirect networking effect of in-stadium spectators on sponsors is assumed to be present (cross-side network externality), if the assumption explained prior is found. Considering the substantial investments made by sponsors, it is crucial to understand underlying mechanisms, such as the positive or negative externalities generated within this multi-sided market.

### ***1.3.2 Visual attention as outcome measure of sponsorship effectiveness***

Visual attention can be categorized as cognitive consumer response measure (Alonso dos Santos et al., 2018; Moore & Zirnsak, 2017). Its influence on downstream outcomes has been widely recognized in research (e.g., Casado-

Aranda et al., 2020; Orquin & Wedel, 2020). Other outcome measures, such as brand awareness, brand purchase, etc. solely come forth if sponsor messages have been visually attended prior (e.g., Breuer & Rumpf, 2012; Lardinoit & Derbaix, 2001). Conceptualizing visual attention has received a significant amount of research over the past 25 years; by now, a substantial number of different models to define attention are present (Borii & Ittli, 2012). Across definitions, visual attention can generally be described as all cognitive operations that influence the selection mechanism of filtering relevant and irrelevant information in a cluttered visual scene (e.g., Evans et al., 2011; McMains & Kastner, 2009). Therefore, attentional mechanisms limit cognitive processing to a subset of incoming stimuli (Evans et al., 2011) and protect the system from information overload (Palmer, 2002).

The sponsorship literature mainly conceptualizes visual attention as stimulus-driven and saliency-based attention (e.g., Borii & Ittli, 2012; Breuer & Rumpf, 2015; Boronczyk et al., 2018). As the terms saliency and gaze are often used interchangeably in the literature, they need to be distinguished first. Saliency refers to characterizing elements within a visual scene, as for example an object that appears to stand out, and is often conceptualized as one component of visual attention (e.g., Itti & Koch, 2000; Itti et al., 1998). Gaze, in turn, describes the coordinated movement of the viewer's eyes concerning visual stimuli (e.g., (Hayhoe & Ballard, 2005; Peters et al., 2005). Only the latter is subject in this thesis. Utilizing eye movements/gaze as a measure of where consumers allocate their covert attention, is based on the pre-motor theory of attention (Rizzolatti et al., 1987). This theory, used throughout this dissertation, suggests that eye movements and attention allocation are driven by the same internal mechanisms (used term throughout the thesis: gaze).

The stimulus-driven definition of attention in sponsorship and marketing research is mainly conceptualized as being comprised of two primary mechanisms: scene-driven (bottom-up) and expectation-driven (top-down) attention (e.g., Breuer & Rumpf, 2012, 2015; Pieter & Wedel, 2004; Simmonds et al., 2020). Within this two-component framework of attention (e.g., Itti & Koch, 2000), objects can either automatically attract attention through the bottom-up mechanism, or be consciously selected by the top-down mechanism. The bottom-up mechanism requires less cognitive resources of the viewer, whereas the top-down mechanism is controlled

actively by the viewer (Parkhurst et al., 2002; Pieters & Wedel, 2004). Concerning sponsor messages within sport broadcasts, it is unlikely that visual attention is allocated through the top-down mechanism, as first, the sport game is the focal content in which the viewer is most interested in, and second, viewers frequently avoid commercial stimuli (Milosavljevic & Cerf, 2008). Instead, the extent of visual attention drawn to sponsor messages is largely contingent upon its ability to engage viewers' salience-driven attention (Breuer & Rumpf, 2012) and might be highly depending on what is happening on the playing field during that moment (high interesting or irrelevant playing action).

One often used and valid proxy for a viewer's visual attention allocation to commercial stimuli based on consumers' eye movement is to determine so-called "gaze hits" (Duchowski, 2007). By using eye-tracking technology, which is a widely known and acknowledged tool to assess consumers' visual attention (e.g., Isaacowitz et al., 2006; Simmonds et al., 2020), all video sequences that included clearly visible sponsor messages on LED-boards can be marked as "areas of interest" (AOIs). These areas can be matched with the participants' gaze data afterwards and the variable "gaze hit", used in this dissertation as outcome measure of sponsorship effectiveness, emerges. A "gaze hit" only was tracked, if the fixation lasted longer than 100 seconds according to previous literature (e.g., Breuer & Rumpf, 2012; d'Ydewalle & Tasmin, 1993). In order to be effective, sponsor messages need to be visually perceived, prior to processing and storing the information. Messages that fail to be visually attended do not have the capability to create other outcomes, such as consumers' brand awareness or future purchase behavior (e.g., Breuer & Rumpf, 2012; Lardinoit & Derbaix, 2001).

### ***1.3.3 The limited capacity model of mediated message processing***

The data-driven limited capacity model of mediated message processing (LC4MP), introduced by Lang (2000, 2006), is a widely utilized model concerning dynamic media research and takes an information processing approach for studying message selection, processing, and effects (e.g., Alonso Dos Santos et al., 2018; Huskey et al., 2020; Lang & Ewoldsen, 2013; Lang et al., 2008). The LC4MP encompasses three main theoretical research areas: cognitive load, motivation, and memory (Lang, 2009). In contrast to prior approaches in media research, the model attempts to open the "black box" of the human processing system to elaborate how dynamic activation and interaction of the cognitive, emotional, physiological, and behavioral

systems guide message processes (Fisher & Weber, 2020). Existing research generally supports the model's core predictions and attributes a predictive as well as explanatory power to the model (Fisher, Huskey, et al., 2018; Fisher, Keene, et al., 2018; Huskey et al., 2020).

In line with the stimulus-driven concept of visual attention in sponsorship research, the LC4MP defines consumers as humans with finite cognitive resources for allocating visual attention to marketing stimuli in dynamic mediated content. Individuals are required to prioritize (whether consciously or subconsciously) specific bits of information over others during message processing. This is necessary to effectively manage their limited cognitive resources. The LC4MP conceptualizes this process of prioritization with the term resource allocation (Fisher & Weber, 2020; Lang, 2000, 2009). Furthermore, the model postulates that human information processing is intrinsically motivated by the two fundamental motivation systems: appetitive and defensive (aversive) system (Fisher, Keene, et al., 2018). Thereby, signs of cognitive resource allocation and motivated processing can be observed through neural psychophysiological responses (e.g., Fisher & Weber, 2020; Lang, 2009; Lee et al., 2019). As the LC4MP recognizes that communication is a temporal process, implying that valuable insights are often lost in post-hoc or cross-sectional analyses, the model emphasizes continuous consumers' response measurements, such as consumers' eye movement, heart rate, skin conductance or facial expressions (Lang, 2009; Lee et al., 2019; Lee & Zhou, 2023).

Research targeting the allocation of cognitive resources based on the LC4MP, has shown them to be affected by camera cuts (e.g., Lang et al., 2006; Lang et al., 2013), motivationally relevant content (e.g., Clayton et al., 2017; Rubenking & Lang, 2014), or content features in video games (Gangadharbatla et al., 2013). In-stadium spectators and the game as 'sport-specific' factors are seen in this dissertation as motivationally relevant content, which can influence consumers' attention allocation to sponsor messages as they capture a high amount of cognitive resources. In-stadium spectators were shown to highly influence the atmosphere and the game depicts the content the consumers are most interested in. Based on the LC4MP, the cognitive resources for attending sponsor messages might highly depend on what is happening on and next to the playing field during sport live



broadcasts. Thus, sport-specific factors might be of high interest for sponsorship effectiveness and message optimization in mediated sport content.

Additionally, literature demonstrated that emotional responses elicited by a stimulus, significantly influence attention allocation to this stimulus in line with the LC4MPs motivational systems. These findings mainly concern stimuli within mediated sport broadcasts as they hold a unique emotional richness created through the games' degree of suspense (e.g., Knobloch-Westerwick et al., 2009; Lee, 2021; Lee et al., 2019; Madrigal et al., 2011). The LC4MP suggests that the appetitive system is triggered by positive emotions (e.g., happiness, joy), which leads to automatic activation of cognitive resources for encoding, especially as emotional intensity (arousal) increases (Lang, 2006). On the other hand, the defensive system responds to negative emotions (e.g., anger, sadness) and shows a shifting pattern of cognitive resource allocation. At lower to medium levels of negative emotional intensity, cognitive resources increase, whereas at very high levels of negative intensity, resource allocation decreases. Early research on sport consumers' responses already noted different system activations during moments of victory or defeat for their team (e.g., Hillman et al., 2004). Given the unique and challenging context of sponsorship evaluation in academics and practical settings, the question arises if the emotional consumer component of the LC4MP is essential concerning the measurement of sponsorship effectiveness. In order to reduce complexity due to incorporating unrealistic data streams for practitioner, leaving out consumers' (biometric) data might establish a higher feasibility for practitioners.

#### **1.4 Outline and contribution of each study**

To address the research questions framed in chapter 1.2, three studies were conducted. Study 1 contributes to the existing research on sponsorship effectiveness by focusing on the role of in-stadium spectators (**RQ1**), while Study 2 investigates the influence of the game as a relevant factor (**RQ2**). Study 3 aims to adapt the findings of Study 2 through an artificial intelligence approach for practical settings to meet the requirements of companies in the sports industry regarding feasible and effective message optimization (**RQ3**).

By doing so, this thesis addresses several gaps in previous research, which are outlined for each study in the upcoming chapters (1.4.1 – 1.4.3). Across the three studies, the thesis makes the following contributions beyond theoretical and practical implications: the studies fully rely on real-time measurement data and

were conducted utilizing full-length live broadcasts as stimulus material in contrast to recorded video sequences as often used in previous studies (e.g., Boronczyk et al., 2018; Lee et al., 2019). Furthermore, biometric measurements were used instead of self-reported data to produce more valid results (e.g., Isaacowitz et al., 2006; Lee et al., 2019; Lee & Zhou, 2023; Potter & Bolls, 2011). The study set-up was designed to be as realistic as possible in line with scientific criteria, aiming for a high link to real-life scenarios (e.g., Boronczyk et al., 2022; Carrillat et al., 2015; Cornwell & Kwon, 2020). At last, all three studies incorporate larger sample sizes compared to previous research within this field (e.g., Boronczyk et al., 2022; Breuer et al. 2021; Lee et al., 2019).

#### *1.4.1 Study I: The impact of in-stadium spectators*

As introduced, in-stadium spectators constitute a fundamental sport-specific element in the multi-sided market of professional sport clubs, significantly influencing its structure and dynamics (e.g., Behrens & Uhrich, 2022; IEG, 2022). Combined, stadium audiences can engender noteworthy direct and indirect benefits for various stakeholders in the sports market, including sponsors (e.g., Dantes et al., 2020; Rohde & Breuer, 2016). However, these benefits may not run in both directions for all stakeholder groups (e.g., Budzinski & Satzer, 2011). Given that consumers frequently avoid commercial stimuli in front of TV (Milosavljevic & Cerf, 2008), with concerns regarding the effectiveness of sponsorship messages persisting. Based on the theoretical predictions of the LC4MP model, in-stadium spectators could potentially amplify this effect through their distracting influence (Lang, 2000, 2006). Thus, exploring the influence of in-stadium spectators on TV consumers' visual attention to sponsor messages holds considerable interest regarding message optimization and has not been investigated in previous studies.

During the COVID-19 pandemic however, in-stadium spectators were banned overnight, and various sport events and games had to be staged without in-stadium spectators. As so, the unique opportunity emerged to isolate their influence on sponsorship effectiveness in a realistic, quasi-experimental study set-up. Based on the concept of multi-sided markets and the assumptions of the LC4MP model, the first study (chapter 3) thus examines the influence of in-stadium spectators' absence/presence on TV consumers' visual attention allocation towards sponsor messages during soccer live broadcasts (**RQ1**). Amongst others, the study furthermore elaborates on the influence of the interaction effect of spectators and

game outcome uncertainty on consumers' visual attention allocation towards sponsor messages. Throughout the study, four hypotheses are answered in total, out of which two are of interest for this thesis: **H2.a** and **H2.b**. By using full-length soccer live broadcasts as stimuli, n=26 highly involved soccer fans participated in the study. Half of the games were staged with in-stadium spectators presence; whereas the other half were staged during times when in-stadium spectators were absent. Using real-time measures, k=144,400 observations emerged for the final multilevel regression analysis based on a second-by-second aggregation.

As mentioned above, this research attempts to address the calls for more realistic study designs in the sponsorship literature by using for the first time full length live broadcasts as stimuli material for the first time (e.g., Cornwell & Kwon, 2020; Lee & Zhou, 2023). Instead of using a synthetic treatment design, in-stadium spectators were absent within the usual setting of watching soccer live broadcasts during COVID-19, rendering the study in a unique position. Theoretically, the study contributes by identifying in-stadium spectators as a significant determinant of sponsorship effectiveness. This finding broadens sponsorship literature by adding a new group of determinants, emphasizing the importance of sport-specific characteristics while enhancing sponsor message visibility (e.g., Kim et al., 2015; Boronczyk et al., 2022). Furthermore, results unveil an underlying mechanism of the LC4MP (Lang, 2000, 2006) model by stating in-stadium spectators as potential distraction for consumers' visual attention allocation due to limited cognitive capacities of the consumer. Besides, the study contributes to research on the concept of multi-sided market concerning professional sport clubs (e.g., Evans, 2016). Findings show that a network effect between in-stadium spectators and TV viewers exists and thus supports the theoretical assumptions of the concept. By applying this concept, the research demonstrates its applicability and significance in fields beyond conventional economic theory, extending into realms such as sports marketing and management (e.g., Zheng & Mason, 2018). By understanding in-stadium spectators as a determinant of sponsorship effectiveness and recognizing occurring network effects, practitioners are able to optimize their sponsor messages and enhance sponsorship effectiveness. Additionally, practitioners can use this knowledge to better adapt and respond to situations like the absence of in-stadium spectators during pandemics or other financial threatening circumstances.

### ***1.4.2 Study II: The impact of the game***

Over several decades, companies seek to link their brands for various objectives with thrilling sport live broadcasts (e.g., LBBOnline, 2022; Sportico, 2022). Thereby, suspenseful games eliciting pleasant emotions build the core element and provide the reason for the soccer clubs' multi-sided markets existence (e.g., Budzinski & Satzer, 2011; Desarbo & Madrigal, 2011; Lee et al., 2019). However, sponsorship effectiveness research has neglected a structured evaluation of the games' influence on consumers' responses to sponsor messages so far. Since sponsor messages used to be rather static in the past, the game was no factor that could have been considered in terms of message effectiveness and optimization. Through the introduction of LED-boards controlled based on AI methodology, digital overlays, and especially real-time adaption, this assumption has changed. What still is the same, is that consumers' primary interest during live broadcasts lies in the sporting action itself (e.g., Breuer & Rumpf, 2012; Lardinoit & Derbaix, 2001) and that they are able to allocate only a small share of attention to sponsor messages as they experience an information-overloaded environment (Boronczyk et al., 2018; d'Ydewalle & Tasmin, 1993). Due to the increased use of big data, the trend to watch sport via online streams, and new in-stadium technologies, it seems more and more feasible to account for the games' context while predicting sponsorship effectiveness (e.g., Boronczyk et al., 2021; Breuer et al., 2021).

Conceptualizing the game as a set of distinct run-of-play characteristics, the occurrence of different run-of-play characteristics on the field might affect consumers' attention allocation to sponsor messages. Based on the spotlight metaphor (e.g., LaBerge, 1983) and the LC4MP model (Lang 2000, 2006), some characteristics might monopolize consumers' full cognitive capacity exclusively for the game leading to reduced attention allocation to sponsor message, others might liberate cognitive resources for sponsor messages. Thus, Study 2 examines the influence of various run-of-play characteristics on TV consumers' visual attention allocation to sponsor messages (**RQ2**). Previous literature in neuroscience state a narrowing attentional focus of visual attention due to suspense (e.g., Bezdek et al., 2015), whereas the sponsorship literature states the opposite (e.g., Boronczyk et al., 2021; Breuer et al., 2021). As so, the interaction effect of the games' degree of suspense with the games characteristics is tested throughout the study as well. Furthermore, the study includes the interaction effect of time with game

characteristics as several studies found significant associations between time effects and consumers' attention allocation (e.g., Boronczyk et al., 2021; Breuer et al., 2021). Thus, three proposed research questions are answered throughout Study 2. Full-length soccer live broadcasts were presented to n=42 highly involved soccer fans. Using real-time measures, k=100,298 observations emerged for the final analysis based on a second-by-second aggregation. Three sets of multilevel regression models were calculated to answer the research questions.

This study makes several theoretical and practical contributions. It extends the literature on sponsorship effectiveness by identifying the game, utilized as distinct run-of-play characteristics, as a significant determinant of sponsorship effectiveness and relevant concerning message optimization. This finding underlines the importance of considering the specific sporting event when determining the effectiveness of sponsorship in terms of the LC4MP model (e.g., Kim et al., 2015; Boronczyk et al., 2022). The study elaborates on contradicting results in neuroscience and sponsorship literature regarding the impact of suspense on visual attention (e.g., Bezdek et al., 2015; Boronczyk et al., 2021; Breuer et al., 2021). This study contributes to this discourse by providing empirical evidence to either support or challenge these findings. Furthermore, the study provides a starting point concerning price negotiation arguments of sponsorships for practitioners, which was often claimed to be missing in literature (e.g., Cornwell & Kwon, 2020; Jensen, 2023; Jensen & White, 2018). In line, the findings reveal how sport games can be utilized for real-time adaptation of sponsor message placement during live sport broadcasts. Based on real-time measurements, this might be particularly valuable for practitioners who seek to optimize their sponsorship messages in dynamic media content.

#### ***1.4.3 Study III: Closing the gap between academics and practice***

During the last years, technological advances and the increased use of big data has significantly transformed the field of marketing, including sports marketing (e.g., Bruffy et al., 2016; Varshneya & Dasgupta, 2018). The emergence of artificial intelligence (AI) presents, amongst others, also new opportunities for sponsors reinforcing sport sponsorship as a highly dynamic field. Along with real-time adaption, real-time evaluation of sponsorships can provide more accurate and timely information for companies (e.g., Nation World News Desk, 2023; Weil, 2023). However, especially the sports industry has been slow in adopting AI and

does not fully exploit its potential (e.g., Ford et al., 2023; Volkmar et al., 2022). Furthermore, the present literature on (sport) marketing calls for real-time analytics (e.g., Ngai & Wu, 2022) and greater applicability of research results (e.g., Jensen & White, 2018; Volkmar et al., 2022). Study 2 of this thesis shows that some run-of-play characteristics significantly influence consumers' attention allocation to sponsor messages, which implies their importance in determining sponsorship effectiveness in live sport broadcasts. However, Study 2, in line with theoretical and literature-based approaches to research the concept of attention, draws its findings based on biometric factors (e.g., Lee et al., 2019; Otamendi & Sutil Martín, 2020; Rumpf et al., 2015). Nevertheless, it remains impractical for companies to include biometric factors, as they are not accessible to sports practitioners (time-consuming collection, special devices required, etc.). In contrast, game characteristics are nearly tracked for every major sports game automatically by practitioners.

As so, Study 3 utilizes a practical-driven approach compared to conventional theory-driven research papers. Based on the significant associations of game characteristics with consumers' responses found in Study 2 (predictions of the LC4MP model), Study 3 aims to render academic findings applicable for practitioner's use by contributing to closing the gap between theory and practice (**RQ3**). Thus, the study seeks to test whether it is feasible to reliably forecast the influence of game characteristics on consumers' response without incorporating consumers' biometric data. For this reason, two supervised machine learning models (one initial, primarily theoretical based model; one adapted model due to available data) were trained using large-scale eye tracking and game-related real-time live data ( $k=77,322$  observations).

The last study of this thesis adds to sports marketing literature by challenging parts of the LC4MPs' predictions, integrating advanced methodologies like AI, and reinforcing to bridge the claimed gap between theory and practice. Demonstrating that emotions and biometric consumer data are not always necessary for predicting consumer responses, the study partially refutes prior findings regarding the LC4MP (e.g., Lee et al., 2019). Thus, it provides a clear example for academics on how to translate academic findings into realistic approaches for practitioners (e.g., Jensen & White, 2018). Furthermore, the study establishes AI as a suitable methodological approach for investigating sponsorship effectiveness.

This highlights the potential of AI in enhancing the accuracy and feasibility of research findings in various fields, which was claimed in literature already (e.g., Kumar & Sharma, 2021). AI can increase the intelligence and efficiency of management processes. However, academics as well as practitioners in the sports industry were slow in adopting. The results enable companies to implement more optimized and effective sponsor messages based on real-time evaluation. By focusing on data that is readily available in the sports industry and leveraging AI, this study presents an approach that can be utilized easily in practice. This approach not only enhances the effectiveness of sponsorships but also sets a precedent for the integration of advanced technologies in sports marketing (e.g., Bruffy et al., 2016; Varshneya & Dasgupta, 2018).

## 1.5 References

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## 2 The impact of in-stadium spectators

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### Abstract

In-stadium spectators affect the emotional value and atmosphere of sport live broadcasts. Due to the COVID-19 pandemic, in Europe, the presence of in-stadium spectators, however, was suspended until further notice. Conceptualizing professional clubs as economic platforms, network effects due to the lack of in-stadium spectators may affect stakeholders' utility. Thus, the main aims of this study are to examine the influence of missing in-stadium spectators for professional clubs by investigating network effects on (1) TV viewers' emotional arousal and (2) TV viewers' attention towards sponsor messages during live football broadcasts. Using a quantitative research design, a controlled lab study was conducted, and broadcasts were presented to  $n = 26$  highly involved participants. Heart rate, eye-tracking, and betting odds data served as measurements of arousal, attention, and game outcome uncertainty and were aggregated on a second-by-second basis ( $k = 140,400$ ). Multilevel regression analysis showed significant differences in viewers' arousal and attention to sponsors, contingent on the presence of in-stadium spectators and game outcome uncertainty. The presence of in-stadium spectators increased arousal, while attention towards sponsor messages decreased, depending on game outcome uncertainty. Based on the presence of network effects, implications to sustainably adapting professional football clubs' business models based on stakeholders' different interests can be given.

*Keywords:* COVID-19; football; spectators; arousal; visual attention; eye tracking; sport sponsoring



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### 3 The impact of the game

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#### **Abstract**

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 adaptations (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

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## 4 Closing the gap between academics and practice

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This chapter is currently undergoing the second round of revisions as:

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### Abstract

Artificial intelligence (AI) and big data have the potential to promote advancement across various industries. Sport management and marketing have also transformed significantly owing to rapid technological advances such as those in AI and big data analytics. However, especially sport companies still do not fully exploit the potential of AI. At the same time, considering the existing sport marketing research, the effectiveness and optimization of dynamic marketing stimuli in dynamic sport media settings remains unclear. This study aims to assess whether the influence of game features on consumers' response, can be forecasted without incorporating consumers' biometric data. Academic theoretical models indicate that individual, biometric features hold considerable influence on consumers' response; nevertheless, it remains impractical for companies to access these data concerning message effectiveness and ROI evaluation. Therefore, the study's purpose is to enhance the feasibility of message optimization for companies by trialing a real-time prediction derived from game features alone. Two supervised machine learning models (one initial, primarily theoretical based model; one adapted model due to available data) were trained using large-scale eye tracking and game-related data, resulting in high predictive accuracy and appropriate applicability of the models. Both models were able to predict consumers' responses with over 90% of accuracy (initial model: 96%; adapted model: 94%). This study exemplifies AI usage in sport marketing and management, enabling companies to implement more effective marketing messages and strategies for their sponsorship based on real-time evaluation.

*Keywords:* sport marketing, sport management, sponsorship effectiveness, eye-tracking, machine learning

## 5 Conclusion and outlook

### 5.1 Major findings and implications

This thesis has shown that the two sport-specific factors, in-stadium spectators and the game itself, are significant determinants of sponsorship effectiveness and vital to consider message optimization. Real-time evaluation shows that these two factors substantially influence consumers' visual attention to sponsor messages in dynamic media. Thus, this thesis extends the current body of knowledge by adding 'sport-specific' factors as a significant determinant group to the literature on sponsorship effectiveness, which only considered sponsor-related, dyadic, sponsee-related, and consumer-related factors so far (e.g., Boronczyk et al., 2022; Cornwell, 2019; Cornwell & Kwon, 2020; Kim et al., 2015). Furthermore, the application of these academic findings in a practical setting was exemplified by the utilization of an AI approach. By answering three research questions, the dissertation builds on previous research on sponsorship effectiveness and the LC4MP (e.g., Boronczyk et al., 2022; Breuer et al., 2021; Lee, 2021) and closes the research gap regarding sport-specific determinants of sponsorship effectiveness, which barely have been researched before. In line with the recent increase of neuroscientific studies in the field of sponsorship effectiveness and attention research (e.g., Alonso Dos Santos et al., 2018; Rumpf et al., 2020), the thesis adopts a realistic study design and (biometric) real-time measurements as demanded throughout the literature (e.g., Cornwell & Kwon, 2020; Lee et al., 2019; Lee & Zhou, 2023; Wascher, 2021).

Regarding the first research question, the results show that in-stadium spectators can be conceptualized as a significant influencer on consumers' visual attention allocation to sponsor messages. Different analyses demonstrated that consumers' visual attention to sponsor messages significantly differs depending on the absence/presence of in-stadium spectators. The study reveals that sponsor messages received greater attention when in-stadium spectators are absent. In line with the LC4MP framework, it appears that TV consumers have greater attentional resources to devote to sponsor messages on LED-boards if no in-stadium spectators are present (Lang, 2009; Lang et al., 2013). However, the influence of in-stadium spectators on consumers' visual attention allocation highly depends on the games' outcome uncertainty, too. First, the study showcased that a game with low outcome uncertainty holds greater potential for sponsors to attract viewers' attention than a game with higher outcome uncertainty. Second, the interaction term of in-stadium

spectators and game outcome uncertainty shows that a calm game, which was played in front of live spectators, leads to less visual attention to sponsor messages. In terms of the multi-sided market theory (Evans, 2016), these findings reveal that sponsors could indeed experience positive as well as negative externalities based on the absence/presence of in-stadium spectators. An indirect networking effect of in-stadium spectators on sponsors is assumed to be present (cross-side network externality) as the association was found to be significant. Nevertheless, the influence highly depends on the games' outcome uncertainty, leading to a positive or negative network effect based on a low or high outcome uncertainty.

The second research question of this thesis aimed to systematically evaluate the influence of distinct run-of-play characteristics on consumers' visual attention allocation to sponsor messages. In total, 39 different run-of-play characteristics were tested throughout three sets of multilevel regression analyses. The results reveal significant associations of several run-of-play characteristics with viewers' visual attention to sponsor messages depending on the distinct game characteristics, the games' degree of suspense, and playing time. However, 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. Most of the common game situations were negatively related, which indicates a central consumer visual attention allocation. Sponsor messages thus 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, 2009; Lang et al., 2013), limiting the cognitive capacity of viewers to sporting content. Only the variable 'goal away' is associated positively. Cam carpets, which are placed directly in the vicinity of the goals, might be an explanation. Additionally, the time slots where no common game situation occur increase the visual attention allocation to sponsor messages, which is again in line with the LC4MP and with the findings of Le Roy and Vivier (2008). 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), but in contradiction to neuroscience literature (Bezdek et al., 2015). In summary, based on the study's findings, the game as sport-specific factor could significantly

influence sponsorship effectiveness and message optimization and should be added to previous literature on relevant determinants of sponsorship effectiveness.

The last research questions and study of this thesis contributes to close the often-claimed gap between theory and practice (Cornwell & Kwon, 2020; Jensen, 2023; Jensen & White, 2018). The adaption of theoretically based academic findings to available data in the sports industry was exemplified. Using an AI modelling approach, the study tested whether an AI model, aligned with academic theoretical predictions but adapted based on available real-time data from sports companies, can accurately predict consumers' visual attention to sponsor messages and enhance message optimization. The results show that even without specific consumers' biometrical features, an AI model evaluates sponsorship effectiveness reliably in real-time. Comparing the two calculated models, a loss of only 2% indicates that an AI application, which deviates partially from the assumptions of the LC4MP, can effectively forecast consumer response to sponsor messages. This leads to the assumption that, within the LC4MP model, biometric consumer data on emotions may not be as crucial as previously conceptualized in earlier research (e.g., Lee, 2021; Lee et al., 2019). Thus, message optimization through real-time adapted content based on a game's run-of-play would be feasible for practitioners. The thesis states AI modelling to be a valid approach to predict consumers' responses to sponsor message during live broadcasts and facilitate its use throughout the field of sports marketing.

In summary, the thesis contributes to the sport marketing literature by adding the two sport-specific factors, in-stadium spectators and the game itself, as relevant determinants for evaluating sponsorship effectiveness in dynamic mediated content. Thereby, the thesis addresses several gaps in previous research beyond theoretical and practical implications (e.g., Cornwell & Kwon, 2020; Jensen, 2023; Jensen & White, 2018; Lee et al., 2019). Real-time measures, including biometric consumer measures, are emphasized as reliable adaptations concerning real-time evaluation of sponsor messages and real-time message optimization. Based on detailed knowledge of game specific influences, academics as well as practitioners can contribute to more effective message placement during live broadcasts. As the field is changing at an overall rapid speed but is sometimes slow in adapting new technologies, this research exemplifies timely evaluation approaches. All three studies incorporate larger sample sizes than previous research

and yet aim towards more realistic study designs (e.g., Boronczyk et al., 2022; Carrillat et al., 2015; Cornwell, 2020; Lee et al., 2019).

Based on the findings, several implications for practitioners can be provided, which are outlined in the previous chapters in detail. However, the following general suggestions can be made: First, reducing cognitive load in live broadcasts (e.g., reducing the noise of in-stadium spectators, less sequences which shows in-stadium spectators, etc.) might free cognitive capacity to increase the consumers' attention allocation to sponsor messages. Staging games without spectators will probably not be an option in the long run, but might be considered under special circumstances such as pandemics. Furthermore, special price negotiations or terms could be provided to sponsors according to the finding of varying attention to sponsor messages based on the absence/presence of in-stadium spectators. Second, the results emphasize that using real-time playable in-stadium LED-boards and cam carpets behind the goals are more effective for sponsor message placement. Optimizing the messages depending on the sporting action itself, the degree of suspense it creates, and the playing time that has passed, is beneficial for creating attention. Valuable time periods could be individually offered to sponsors. Those are time slots where no common game situation occurs during broadcasts (e.g., passing back and forth), time slots with those seconds of the run-of-play, which do not include negative associated game situations and ball possession/position situations (e.g., kickoffs), time slots where replays are broadcasted, time slots towards the end of the game, and time slots showing cam carpets. The last implication concerns real-time evaluation and real-time adaption of sponsor messages in live broadcasts, which was exemplified in the third study of this thesis. Both approaches could be offered to sponsors and could influence sponsorship price negotiation. Sponsors could receive, for example, a comprehensive, individualized report shortly after or even during each game concerning their visibility. Furthermore, sponsorship packages could be offered in tiers on a more comprehensive argumentation base, ensuring, for example, high-visibility time slots for 'premium' sponsors.

## **5.2 Avenues for future research**

The thesis indicates several directions for future research. To enhance research on sponsorship evaluation, future studies should include the full range of factors stated in the literature as relevant determinants of sponsorship effectiveness (e.g.,

consumer-related, sponsor-related, dyadic, sport-related, etc.). Aiming for a comprehensive and holistic approach, research on the determinants in reference to each other might bring more clarification in terms of importance and enhanced, optimal message placement during live broadcasts. Additionally, future studies with larger sample sizes could further explore enhanced cognitive processing of the sponsor messages (e.g., brand recall, awareness, etc.), as this study concentrated only on visual attention as outcome measure. Machine learning and artificial intelligence could be a valuable tool in future research, particularly for detecting subtle effects and developing dynamic pricing models for sponsor message placement. Also and especially these approaches can be used to further bridge the gap between academic and practice. This technology could identify optimal time-periods for sponsorship beyond the current study's scope. Thus, the study's results could spur further research in below-the-line marketing communication apart from the sports context. Furthermore, message personalization instead of optimization could be the next step of studies in the outlined research area. At last, concentrating on more underlying network effects of multi-sided markets in terms of technology developments and digitalization might be beneficial (Sanchez-Cartas & Leon, 2021; Trabucchi & Buganza, 2020).

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## **Abstract**

Despite the significant growth of sport sponsorship and attention research in general, sport sponsorship evaluation continues to be an object of debate within the literature and it seems challenging to offer a universal evaluation solution for companies. In line with the ongoing debate, in-stadium message placement presents unique challenges, however, has been repeatedly questioned. As during live broadcasts, the in-stadium messages share the screen with the media content that holds the audience's primary interest, sponsor messages are typically processed by consumers as peripheral signals rather than central ones. In contrast to the peripheral nature of sponsor messages displayed during live broadcasts, the sport game is the core element, which the consumers are interested in the most. However, the influence of sport-specific factors on sponsorship effectiveness has rarely been researched so far. Furthermore, academics and practitioners alike advocate the need for advanced sponsorship evaluation calling for more reliable measures of sponsorship effectiveness and more connectivity between theory and practice. Thus, this dissertation aims to close these gaps by investigating the influence of two sport-specific factors that might affect consumers' visual attention allocation towards sponsor messages: in-stadium spectators and the sport game itself. Furthermore, an AI approach was utilized to address the need for enhanced application of academic findings for practitioners. Based on the concept of multi-sided markets and the predictions of the LC4MP model, multi-level modelling revealed a significant association of in-stadium spectators and the game with consumers' visual attention allocation on sponsor messages. Both factors can be conceptualized as significant determinants of sponsorship effectiveness throughout sport live broadcasts. Additionally, testing two AI models, one aligned with theoretical predictions, the other one adapted due to available data of practitioners, demonstrated applicability of research results for practitioners and enhanced sponsorship effectiveness based on a timely evaluation approach.

## **Kurzfassung**

Trotz des bedeutsamen Wachstums an Literatur zu Sponsorings- und Aufmerksamkeitsforschung, bleibt die Evaluation von Sportsponsoring ein diskutiertes Thema, und es scheint herausfordernd, eine universelle Evaluationslösung für Unternehmen anzubieten. In Übereinstimmung mit der anhaltenden Debatte, stellt die Platzierung von Sponsoring-Botschaften im Stadion eine einzigartige Herausforderung dar und wird ebenfalls wiederholt hinterfragt. Da während Live-Sportübertragungen die Sponsoring-Botschaften den Bildschirm mit den Medieninhalten teilen, die das primäre Interesse des Publikums bündeln, werden Sponsoring-Botschaften von den Konsumenten typischerweise als periphere statt zentrale Signale verarbeitet. Im Gegensatz zur peripheren Natur von Sponsoring-Botschaften während Live-Sportübertragungen, ist das sportliche Spiel jedoch das Kernelement der Übertragung. Jedoch wird der Einfluss sport-spezifischer Faktoren auf die Effektivität von Sponsoring-Botschaften in der Literatur bisher nur sehr spärlich beleuchtet. Sowohl Akademiker als auch Praktiker fordern fortgeschrittene Methoden zur Evaluation von Sponsorings, die zuverlässig für Effektivität und einer besseren Vernetzung zwischen Theorie und Praxis sorgen. Daher zielt diese Dissertation darauf ab, die aufgezeigten Forschungsdesiderate zu schließen, indem sie den Einfluss von zwei sport-spezifischen Faktoren auf die Zuweisung der visuellen Aufmerksamkeit der Konsumenten auf Sponsorenbotschaften untersucht: Zuschauer, die sich im Stadion befinden und das Spiel an sich. Darüber hinaus wurde ein KI-Ansatz genutzt, um die verbesserte Anwendung von akademischen Ergebnissen für Praktiker exemplarisch darzustellen. Basierend auf dem Konzept von mehrseitigen Märkten und dem LC4MP-Modell, haben mehrere Mehrebenenmodelle eine signifikante Verbindung zwischen den Zuschauern im Stadion, dem Spiel und der Zuweisung der visuellen Aufmerksamkeit der Konsumenten auf Sponsoring-Botschaften aufgezeigt. Beide Faktoren können als signifikante Determinanten von Sponsoring-Effektivität während Live-Sportübertragungen konzeptualisiert werden. Zusätzlich zeigten zwei KI-Modelle, dass eine im Einklang mit theoretischen Vorhersagen, dass andere angepasst aufgrund verfügbarer Daten von Praktikern, die Anwendbarkeit von Forschungsergebnissen für Praktiker basierend auf einem zeitgemäßen Bewertungsansatz.