

# Spectator sport and fan behavior: A sequel

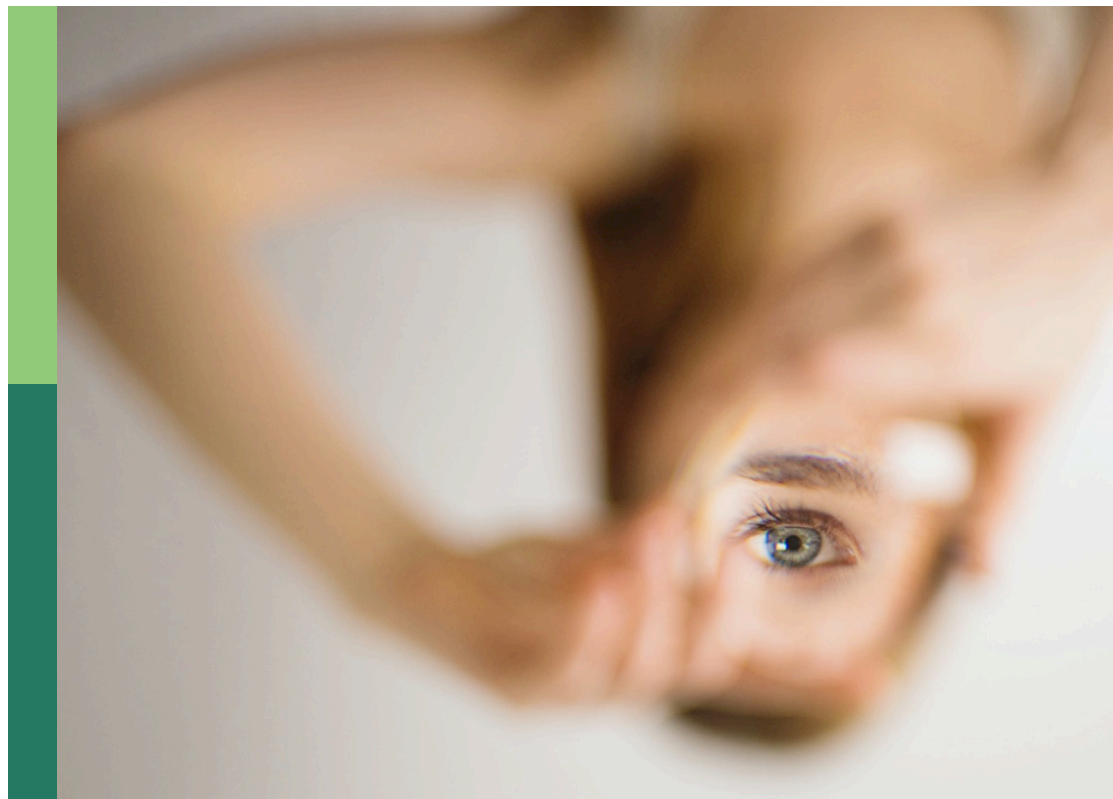
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# Spectator sport and fan behavior: A sequel

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# Editorial: Spectator sport and fan behavior: a sequel

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## Editorial on the Research Topic

### Spectator sport and fan behavior, volume II

In the grand amphitheaters of modern society, spectator sports emerge as vibrant tapestries that weave together the passions, emotions, and collective spirit of millions (Galily, 2019; Galily et al., 2023). From the thunderous roars of a stadium to the intimate hum of a neighborhood bar, the allure of spectator sports transcends geographical, cultural, and social boundaries. At the heart of this phenomenon lies the intricate dance between the athletes on the field and the fervent supporters in the stands. The dynamic relationship between spectator sport and fan behavior is a captivating study, evolving around psychology, sociology, and anthropology that shape this unique and powerful connection (Dwyer et al., 2018).

Spectator sports, ranging from football and basketball to cricket and rugby, have become modern-day rituals, fostering a sense of identity and community among diverse groups of people. As fans gather in colossal arenas or huddle around television screens, they embark on a collective journey fueled by a shared love for the game. The spectacle unfolds not only on the playing field but also in the stands, where the energy of the crowd becomes an integral part of the sporting experience.

The behavior of sports fans is a multifaceted phenomenon that defies easy categorization (Giulianotti, 2002). It encompasses a broad spectrum, ranging from the exuberant celebration of triumph to the despondent anguish of defeat. Fans invest emotionally, mentally, and even financially in their chosen teams, transforming a mere pastime into a visceral, sometimes all-consuming, passion. This deep emotional involvement often transcends reason, as the victories and losses of a team mirror the highs and lows of the fans' own lives.

The psychology of fan behavior is a captivating subject that psychologists and sociologists have probed for decades. The concept of sports fandom taps into fundamental human instincts, such as the desire for belonging and the need to identify with a collective. Fans often see their chosen teams as extensions of themselves, forging a powerful connection that goes beyond the boundaries of the playing field. This psychological investment influences how fans interpret events, form allegiances, and even navigate the complexities of their own social identities.

Beyond the emotional investment, spectator sports have also become arenas for social interaction and cultural expression. Stadiums and sports bars transform into communal spaces where diverse individuals unite under the banner of shared allegiance. The ritualistic nature of sports fandom, from pre-game tailgates to post-victory celebrations, creates a sense of camaraderie that transcends societal divisions. These shared experiences become

threads in the fabric of cultural identity, contributing to the rich tapestry of human social interaction.

However, the euphoria of fandom is not without its darker shades. The passionate devotion to a team can sometimes manifest in aggressive or unruly behavior. Instances of hooliganism, verbal abuse, and even violence are stains on the otherwise colorful canvas of sports fandom. Understanding the factors that contribute to such extremes is crucial in developing strategies to ensure that the communal joy of sports does not devolve into a chaotic and unsafe environment.

In this exploration of spectator sport and fan behavior, we unraveled the intricate threads that compose this complex tapestry. From the psychological underpinnings of fandom to the societal impact of sports culture, our journey delved into the heart of this phenomenon, examining the highs and lows, the unity and discord, and ultimately, the enduring allure that makes spectator sports an integral part of the human experience.

Eleven papers included in our current Research Topic. [Lev et al.](#) study sheds light on the dialogue between older players and the audience. Similarly, [Kaden et al.](#) paper focuses on German soccer fans because an increasing number of media reports note problems for the fans in this regard, reporting eroded loyalty, increasing alienation, or turning away. [Galily et al.](#) research examined a variety of demographic factors influencing browsing device trends before, during (“second screen”), and after sports games. It does so by utilizing survey data from Israeli viewers of the 2022 world cup using a convenience sample ( $n = 242$ ). Still with the world cup, [Deng et al.](#) analysis explored online fan satisfaction with the video assistant referee (VAR) during the FIFA world cup Qatar 2022. A structural equation model comprising perceived value, fan expectation, fan identification, and fan satisfaction. Thereafter, [Schleifer and Tamir](#) article focuses on the Esthetics of team uniform Colors and identifies the artistic roles they fill. [Shi and Ren](#) study identified the motivations that relate to Chinese e-sports viewers’ attitude as well as their watching intention, and underscores the role of satisfaction with past experience, which were understudied. [Ryu et al.](#) research aims to explore the determinants of the league of legends champions Korea highlight views and comment counts. The data of 629 game highlight views and comment counts for seven tournaments were collected from YouTube. Next, [Levental et al.](#) study presents a thorough investigation of the attitudes and emotions expressed by the spouses and girlfriends of sports fans within the context of their long-term relationships.

Within online communities, [Levental](#) conceptual examination used several examples of online sports fan communities in Israel to analyze their core elements. Within this context, the article focuses on the significance of humor, trivial knowledge, and counter-modern concepts as the key elements fostering unity among fans. Then, [Glebova et al.](#) tried to answer the question “How (and why) do sports venue digital twin emerging technologies prospectively impact the sports spectators’ customer experiences?” Lastly, [Hayat](#) enquired about the dynamics between online social

connections and creative expressions in the realm of ESports. Therefore, this research paper examined a correlation between people’s creativity and their Effective Network Size (non-redundant ties) on Twitter, to see if potentially non-redundant information is related to creativity.

Indeed, further research on spectator sport and fan behavior is imperative to comprehensively understand the intricate dynamics at play. Future key areas requiring investigation include the psychological motivations behind fan behavior, social dynamics within fan communities, the impact of technology on fan engagement, instances of fan violence and aggression, the economic implications of spectator sports, cultural influences on fan behavior, and the efficacy of fan engagement strategies. By delving deeper into these areas, researchers can contribute valuable insights that inform the development of policies and practices aimed at enhancing the spectator experience, fostering fan loyalty, and ensuring the long-term viability of spectator sports. Additionally, integrating AI methodologies into research on spectator sport and fan behavior could provide novel insights by analyzing vast datasets, predicting fan trends, and personalizing fan experiences, thus further advancing our understanding of this complex phenomenon ([Galily, 2018](#)).

## Author contributions

YG: Conceptualization, Methodology, Writing—original draft. SP: Conceptualization, Formal analysis, Writing—review & editing. IT: Formal analysis, Writing—original draft.

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# Missed a live match? Determinants of League of Legends Champions Korea highlights viewership

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This research aims to explore the determinants of the League of Legends Champions Korea (LCK) highlight views and comment counts. The data of 629 game highlight views and comment counts for seven tournaments were collected from YouTube. The highlight views and comment counts were regressed on a series of before-the-game factors (outcome uncertainty and game quality), after-the-game factors (sum and difference of kills, assists, multiple kills, and upset results), and match-related characteristics (game duration, evening game, and clip recentness). A multi-level least square dummy variable regression was conducted to test the model. Among the before-the-game factors, outcome uncertainty and game quality were significantly associated with highlight views and comment counts. This indicated that fans liked watching games with uncertain outcomes and those involving high-quality teams. Among the after-the-game factors, an upset result was a significant determinant of esports highlight views and comment counts. Thus, fans enjoy watching underdogs win. Finally, the sum of kills and assists only affected view counts, which indicated that fans prefer watching offensive games with more kills and a solo performance rather than teamwork.

## KEYWORDS

esports, highlight viewership, League of Legends, League of Legends Champions Korea, outcome uncertainty, upset result, YouTube

## 1. Introduction

Esports is one of the fastest-growing sports industries and often shown as the form of professional sports league (Scelles et al., 2021). In 2020, the viewership of esports reached around 500 million, and the total estimated revenue of the esports industry was 160 billion US dollars (Newzoo, 2020). The biggest contributor to this rapid growth of esports has been its successful association with social live-streaming services (SLSS), particularly through platforms like Twitch and YouTube (Block and Haack, 2019). Unlike traditional professional sports, esports games are mostly broadcasted by SLSS, rather than traditional television (TV) channels.

SLSS viewers have different preferences than those of traditional TV. The most striking feature of SLSS is their interactive and synchronous nature. Every user can broadcast live videos, and viewers can interact with the broadcaster and other viewers via features like comments, chats, likes, and real-time donations (Scheibe, 2018). These unique features of SLSS seem to complement the interactive nature of video games; therefore, SLSS and esports have achieved remarkable success together (Bründl et al., 2022).

This emerging trend in esports has attracted scholarly attention. Existing research on esports and SLSS mostly focuses on the definition of esports (Wagner, 2006; Sjöblom and Hamari, 2017; Heere, 2018; Parry, 2019; Postma et al., 2022), motivations for watching esports (Brown et al., 2018a; Xiao, 2020), individual game streamers (Li et al., 2020; Xu et al., 2022), the relationship between playing video games and watching game streams (Jang and Byon, 2020; Jang et al., 2021), esports governance (Peng et al., 2020), esports players' wellbeing (Hong, 2022), and parasocial interaction (PSI) in SLSS (Leith, 2021; Wulf et al., 2021). Despite this initial scholarly interest, a few recent studies have tried to explain the esports industry (Newman et al., 2022), esports viewership (Watanabe et al., 2021), and esports replay viewership (Wang, 2022).

A highlights video is generally used as a teaser to attract new viewers to watch live streaming regularly (Bae and Kim, 2022). Video highlights are also popular in professional sports because fans cannot physically watch every game in real-time (McCammon, 2021). Compared to the monopolistic TV broadcasting services, SLSS provide consumers more freedom to specifically choose the video they want to watch. In addition, SLSS consumers are not restricted to a single TV for the entire family because they use their own mobile devices for streaming. Consequently, the demand for highlight videos has increased because consumers are faced with more choices in a limited time (Park et al., 2018).

The majority of esports fans are young men (Sjöblom and Hamari, 2017), namely "generation Z", who are not as interested in watching live games as the older fans of traditional sports are (Silverman, 2020). Consequently, the consumption pattern of esports leagues is shifting from TV to mobile devices and from live games to highlights. Furthermore, the existence of various social media platforms enables sports organizations and teams to use short video clips, such as highlights, as a marketing tool to increase awareness and interest among existing and potential fans (Easton, 2020). Thus, the key to understanding esports leagues fans would be to identify the determinants of online highlights viewership, instead of the viewership of live games. In addition, studies on elite esports tournaments were limited yet (Scelles et al., 2021).

Herein, we aimed to explore the determinants of esports' highlight videos viewership. Considering the unique feature of SLSS, we identified the determinants of comment counts, which represents a new type of esports consumption via SLSS, as well as the traditional view counts. Focusing on the League of Legends Champions Korea (LCK), one of the most popular esports leagues in the world, this study successfully identified the determinants of highlights viewership and comment counts. The determinants, namely outcome uncertainty, the expected game quality, upset results, and evening games were found to be positively correlated to views and comment counts. In-game statistics, such as the sum of kills and assists, affected the view counts only; fans prefer offensive games with a solo performance. The results shed light on a deeper understanding of esports' fan demand and online viewership and have practical implications for esports and SLSS industries.

## 2. Literature review

### 2.1. Esports

Esports research has recently become a promising topic for sports, games, and communication scholars. In the early stage, most of esports research focused on the issue of whether esports should be included as sport or not (Heere, 2018; Parry, 2019; Postma et al., 2022). For example, Parry (2019) argued that esports do not qualify as sports based on the Olympic concept. However, Hamari and Sjöblom (2017) proposed an alternative perspective, suggesting that esports can be considered as a form of sports characterized by electronic systems facilitating the primary aspects of the sport. According to their definition, human-computer interfaces mediate the input of players and teams, as well as the output of the esports system. Despite the ongoing debate surrounding the classification of esports as a sport, it is undeniable that esports is situated within the sports industry and is a subject of interest in sport academic research (Hamari and Sjöblom, 2017; Heere, 2018).

Also, there are some studies related to esports governance (Peng et al., 2020) and esports player's related issues such as well-being and health (Bányai et al., 2019; Hong, 2022). Parry (2019) conducted an examination of the sustainability of the esports governance model, aiming to lay the groundwork for the creation of a more sustainable and balanced esports ecosystem. Their study focused on developing an ecosystem that considers the interests and rights of all stakeholders. Along with the esports governance literature, Hong (2022) conducted an investigation into the roles and responsibilities of esports stakeholders in safeguarding the health and well-being of esports players.

Extant research on esports consumers has mostly focused on the motivations of consuming esports. Some empirical studies have attempted to determine the differences and similarities in consumer behavior between esports and traditional sports (Lee and Schoenstedt, 2011; Brown et al., 2018b). For example, Brown et al. (2018b) aimed to delineate esports and traditional sports consumption and the contrast between them. More than 1,300 esports consumers answered surveys regarding the uses and gratifications obtained when consuming esports and mediated traditional sports. The results suggest that esports consumers seek media for both esports and traditional sports with similar motivations, specifically social support, fanship, and Schwabism, which is a form of information gathering intended to help one become more knowledgeable about sports (Ruihley and Hardin, 2011).

Some studies have focused on the phenomenon of esports streaming and streamers (Leith, 2021; Wulf et al., 2021). For instance, Wulf et al. (2021) were interested in the PSI among streamers of Twitch, one of the most popular video games streaming platforms. The results indicated that more interactive streams, where individual viewers were addressed by reacting to their chat messages, affected the PSI experiences positively.

Studies evaluating the relationship between playing the game and watching game streams, such as Jang and Byon (2020), found that those involved in recreational gameplay are more likely to consume esports media. Subsequently, Jang et al. (2021) classified esports media into two distinct categories: streamer's live

streaming content and esports event broadcasts. They examined the mediating effect of live streaming esports content on the relationship between esports gameplay and esports event broadcast consumption. The results demonstrated that the intention to consume esports content through live streaming completely mediated the relationship between esports' recreational gameplay and event broadcast consumption.

To advance the understanding of esports consumers' behavior, several studies have analyzed the motivations and antecedents for esports media consumption (Sjöblom and Hamari, 2017; Xiao, 2020). Sjöblom and Hamari (2017) conducted an online survey of esports viewers from Reddit, Facebook, Twitter, and other game-related platforms. The results showed that knowledge acquisition was a positive predictor of esports viewership, suggesting that watching esports games helps in learning about the teams/players and other aspects of the games. Xiao (2020) also explored the factors that correlate with the behavioral intentions of watching esports based on the theory of reasoned action. The findings revealed that three behavioral belief-related factors (aesthetics, drama, and escapism) and subjective norms were positively associated with attitudes toward watching esports.

In general, earlier esports literature conducted surveys and interviews of esports fans to understand consumer behavior (Qian et al., 2020; Xiao, 2020). Recently, empirical studies have focused on analyzing factors affecting esports viewership using esports' game-level data are being focused on (Watanabe et al., 2021; Wang, 2022).

## 2.2. Determinants of sports fan demand

Identifying key determinants of esports fan demand would be important to systematically understand individuals' decision making for esports viewership. Most literature on the demand of sports fans focused on live attendance and identified before-the-game expectations as determinants because the decision to go to a game is made before the game starts. Several before-the-game factors have been identified, such as match quality, star player effect, and outcome uncertainty. Match quality based on team performance, such as league standing (Benz et al., 2009) and total league points, (Buraimo and Simmons, 2008; DeSchriver et al., 2016) particularly influence the fans' demand. In general, a better-performing team drives more attendance. Additionally, star players and players' salaries reportedly affect attendance demand in a positive way (Jewell, 2017; Sung and Mills, 2018; Humphreys and Johnson, 2020).

Fan preference toward outcome uncertainty has been widely studied. The uncertainty outcome hypothesis (UOH) of Rottenberg (1956) states that fans prefer uncertain outcomes compared to certain ones. Using betting odds as a proxy of win probability, early empirical evidence supported the UOH (Knowles et al., 1992; Rascher and Solmes, 2007; Benz et al., 2009). However, recent empirical studies have reported different results; fans prefer certain game outcomes, where either the home team wins or loses, compared to uncertain outcomes (Beckman et al., 2012; Martins and Cró, 2018; Sung and Mills, 2018; Besters et al., 2019). Coates et al. (2014) were the first to explain this contradictory

evidence toward the UOH by applying the theoretical model of reference-dependent preference with a loss-averse agent. They explained that fans have expectations or references before going to a game, and the difference between their reference and the actual outcome generates additional (dis)utility. They also argued that fans prefer certain outcomes to uncertain ones because they do not want to have a large chance of getting disutility from an unexpected loss compared to the extra utility from an unexpected win (i.e., loss averse) when the outcome becomes more uncertain.

Competitive intensity is identified as a determinant of attendance in recent literature on European football leagues. As European football leagues have complicated prize structure depending on the final standing such as promotion and relegation, the European Champions League and the Europa League qualification, teams compete each other for more than one prize (Wagner et al., 2020). Several studies have attempted to measure the intensity of competitiveness according to different prizes in a league during ongoing season (Addesa and Bond, 2021; Hautbois et al., 2022).

Other match-related characteristics such as day of the week (Buraimo and Simmons, 2008), game time (Krumer, 2020), weather (Ge et al., 2020), and geographical distance between competing teams (Humphreys and Miceli, 2020; Sung and Pyun, 2023), are commonly used as determinants of sports demand. Home team market size and conditions, such as population, average income, stadium quality, and ticket prices, are the other identified determinants of attendance demand (Pyun et al., 2020).

Similar to studies on live attendance, most literature on TV demand have focused on before-the-game expectations, such as outcome uncertainty and superstar effects (Hausman and Leonard, 1997; Kanazawa and Funk, 2001; Forrest et al., 2005; Paul and Weinbach, 2007; Alavy et al., 2010; Tainsky, 2010). Allan and Roy (2008) and Cox (2018) explored the difference between live attendance and TV viewership. Empirical evidence suggests that the preferences of TV viewers are different from those of live attendance. Usually, live attendees are regarded as fans of the home team who strongly want their team to win (Humphreys and Zhou, 2015). However, TV viewership does not have this restriction; the viewer can be anyone who lives in the home (or away) team city, supports the home (or away) team, or lives in any region without a team preference, including international fans. Thus, there is a difference in the empirical evidence between live attendance and TV viewership, especially in their preference for outcome uncertainty (Feddersen and Rott, 2011; Cox, 2018). The results suggest that the fans' preferences may vary depending on the sports leagues or media platforms and thus, should be tested for esports fans via SLSS platforms.

## 2.3. Demand for highlights

While sports highlights or post-game shows have a long history in traditional TV services, only limited studies have focused on the viewership of highlights. Despite the limited number of studies, the existing literature can be categorized as follows: (i) studies focusing on the factors affecting viewership and (ii) studies analyzing the

relationship between highlights viewership and TV viewership (Bae and Kim, 2022).

Dietl et al. (2003) assessed the determinants of highlights viewership of the German Bundesliga, and Salaga et al. (2022) studied the pre-game, actual game, and post-game viewership separately. Specifically, Salaga et al. (2022) categorized the determinants as follows: anticipated match characteristics (before-the-game expectation in our terms), temporal characteristics (match-related characteristics in our terms), substitutes and weather, and the actual match characteristics. Han et al. (2021) covered the viewership of highlight videos in the Korean soccer league and identified important determinants of online viewership, such as importance of the game, whether the match is a derby, in-game performance [actual match characteristics in Salaga et al. (2022)], and recentness of the highlight videos.

The demand for esports leagues remains unexplored in the academic field. A few recent studies have tried to explain the esports industry (Newman et al., 2022) and esports viewership (Watanabe et al., 2021). Most recently, Wang (2022) examined esports replay viewership data, focusing on the evidence supporting skill-based star effect and Butler and Butler (2023) tested the relationship between English Premier League highlight viewership and closed door games without attendance during the COVID-19 pandemic.

## 2.4. Present study

While live attendees and local TV viewers are often regarded as home team fans (Coates et al., 2014; Salaga et al., 2022), highlight viewers via YouTube can be anyone; they may be a fan of the home or away team, or a neutral fan. In such case, individual team-level measures cannot be applied, and team-level data are aggregated as game-level data for all variables.

Using a similar approach as that of Han et al. (2021) and Salaga et al. (2022), and given that highlights are generated after the live game, the highlights video demand factors can be broadly divided into three categories: before-the-game expectations, match-related characteristics, and after-the-game factors.

The factors determined before the game include match quality, super-star effects, and outcome uncertainty. For game quality, current team performance (e.g., league standing) within a season before the game starts is commonly used in the previous studies (Buraimo and Simmons, 2008; Benz et al., 2009; DeSchriver et al., 2016). However, current team performance measures are renewed at the beginning of every season, and team statistics early in the season are not reliable indicators as only a few games would have been played. Furthermore, winning against either a weaker or a stronger opponent is regarded as the same in these measures. To deal with these issues, we applied the Elo rating system as an indicator of game quality following Salaga et al. (2022). The Elo rating is a numerical system which covers all team performances while considering the quality of the opponents. Thus it outperforms other traditional measures, such as league standings or win percentages (Elo, 1978).

To capture the star players' effects, the number of all-star players or players' salary is often used in the previous literature (Humphreys and Johnson, 2020; Salaga et al., 2022). However, there

is no all-star game in the LCK and the details of players' salaries are not open to public. Instead, LCK has two unique features compared to other sport leagues. (i) The reserve clause is not applied to any players, and every contract is one-year long. Thus, a player transfer during ongoing season is rare, and was not observed during the study period. (ii) Teams tend to use the same five players for every game during a season. By combining these two features, we argue that the team-year fixed effect captured the star players' effects.

We also identified the preference toward outcome uncertainty and game-related characteristics (day of the week and game time) as determinants of highlights viewership. However, other factors such as weather and home team market characteristics, were not included in our analysis. Even though LCK has a distinct home and away team for every game, the games are played in a neutral arena so that the distinction between home and away is not applicable.

Competitive intensity is not considered in this study either. Competitive intensity is often used in studies with European football leagues that have different prizes depending on league standings (e.g., international league qualification) (Wagner et al., 2020). LCK league has a relatively simple championship determination with playoff system.<sup>1</sup> Also, as relatively large number of teams (five to six out of 10 teams) will make a playoff appearance, playoff contender could be most of teams during season.

Unlike studies on live attendance and TV viewership, highlights viewers decide to watch highlights after a game finished; therefore, factors determined after the match could affect viewership (Han et al., 2021; Salaga et al., 2022; Butler and Butler, 2023). For after-the-game factors, we include upset results, in-game statistics, and match duration.

In line with reference-dependent preference with loss aversion, unexpected game outcomes, especially unexpected losses, reportedly generate emotional cues that trigger the fans' subsequent behavior (Card and Dahl, 2011; Ge, 2018; Matti, 2021). In addition, deposition theory explains that enjoyment derived from watching a game depends on the emotional investment in the favorite team with the preferred game outcome (Raney, 2013). Therefore, to test the impact of unexpected outcomes on viewership, we included game outcomes and upset results in our analysis.

## 3. Empirical methods

### 3.1. Data

This study explores the highlights of the LCK league. The video game League of Legends (LoL) was released in 2009 by Riot Games and has become one of the most popular video game in the world. Based on this popularity, several professional leagues have been formed depending on geographical location. As of 2023, there are 9 professional leagues over 90 teams collectively. The LCK league is one of the four major LoL leagues in the world. Currently, ten teams participate in the LCK league, and each team plays double round-robin tournaments (18 rounds with 10 teams) as a regular season. Each game consists of three sets (best of three). The LCK league

<sup>1</sup> International league qualification is determined by the final standing from the result of playoff games. This study only focuses on regular season games, not playoff games.

hosts two regular tournaments each year (spring and summer), and each tournament contains 90 games.

After the regular season games, the top five (until 2020 LCK Summer) to six teams advance to the playoff stage and follows a single elimination bracket system. The final championship is determined by the result of playoff stage. Until 2020 LCK Spring, the LCK utilized a relegation and promotion system referred to as the “LCK Promotion Tournament”. This system enabled teams from both the LCK and the secondary league, called Challengers Korea (CK), to contend for LCK spots. The bottom two teams in the LCK compete against the top two CK teams for LCK league appearance in the next tournament.

The LCK league runs a YouTube channel, and posts highlight videos after every game. We collected view and comment counts, of each game’s highlight videos on the LCK’s YouTube channel via the YouTube application programming interface (API). From the 2019 LCK Summer to the 2022 LCK Summer, we collected the viewership data on 629 game highlights from seven tournaments.<sup>2</sup>

For every game, we collected the duration of game time and the number of kills, assists, and multiple kills of both teams from <https://lol.inven.co.kr>. A kill is defined as a player killing the opponent player in the game, and is similar to scoring in traditional sports.<sup>3</sup> Using the number of kills for each team, we calculated the sum of kills and the absolute value of the difference in kills to determine whether fans prefer offensive games (sum of kills) or games dominated by one team (difference in the kills). We also collected the number of assists and multiple kills as additional in-game statistics. Similar to traditional sports, an assist is defined as a player(s) helping teammates kill the opponent. Note that assists can be awarded to several players or there could be no assists for a kill. Thus, the sum of assists would indicate whether fans preferred teamwork or solo performances (more assists mean more teamwork). Multiple kills is defined as a player consecutively killing opponents within ten seconds. Multiple kills is usually an outcome of the in-game fighting which most players participate in. It is the most remarkable moment for fans, and the game’s outcome is often determined during this fight.

We collected the betting odds for each game from <https://www.oddsportal.com> and used it as an indicator of game outcome uncertainty. Betting odds were converted to implied probabilities using Kuypers (2000)’s method to deal with the bookmakers’ margins. Unlike traditional sports, every LCK game is played in a neutral arena, so a home-and-away distinction is not applicable.<sup>4</sup> Thus, we used the squared difference between win probabilities for both teams as an uncertainty measure, following Buraimo and Simmons (2015); the smaller the difference, the greater the uncertainty. We also used the Theil measure, which has been commonly used as an indicator of outcome uncertainty (Beckman et al., 2012; Pawlowski and Anders, 2012; Serrano et al., 2015; Schreyer et al., 2018). Theil measure was calculated using the

following formula:

$$\sum_{i=1}^2 p_i \log\left(\frac{1}{p_i}\right) \quad (1)$$

where  $p_i$  is the win probability of team  $i$ . The higher the Theil measure, the greater is the uncertainty.

We calculated the Elo ratings for each team before every game. The 2018 LCK Summer tournament, two tournaments earlier than our sample, was set as a reference, and it was assumed that every team has the same quality (i.e., same Elo points). Subsequently, we calculated the Elo points for every game outcome the same method as that used by Ryall and Bedford (2010) and Nguyen et al. (2020). The sum of the Elo ratings of both teams were used to represent the overall game quality (Salaga et al., 2022).

We generated a binary “upset results” variable which was equal to one where a weaker team with poor betting odds won and zero otherwise. We also generated the interaction term between the upset dummy and absolute difference in win probability between the two teams; the impact of the upset results was expected to be higher when the upset is more unpredictable (i.e., the absolute difference in win probability was high).

Match-related characteristics, such as the day of the week and start time (before or after 6 pm), the interval between the posted date and data collected date to determine the recentness of the highlights clip, were collected.

Table 1 presents the summary statistics of the variables. The average view count was 127,234 and the average comment count was 237.5. The squared win difference was 0.23 and the sum of the Elo ratings was 3,015 on average. The average sum of the kills was 55.2, ranging from 22 to 114. The average difference in kills was 15.1. A total of 176 outcomes (27.9%) were upset results. The average duration of a game was 163 min and 49.4% of the games were played after 6 pm.

## 3.2. Analysis

To explore the determinants of the LCK league highlights view counts, the following empirical model was formulated:

$$\ln(\text{viewcount})_{ijwt} = \beta_0 + X'\gamma + Z'\rho + W'\theta + \alpha_i + \delta_j + \lambda_t + \epsilon_{ijwt} \quad (2)$$

where  $\ln(\text{viewcount})_{ijwt}$  is the view count of the LCK league game for the home team  $i$  and away team  $j$ , in the week  $w$ , in the tournament  $t$ .  $X$  is a vector of variables that captures before-the-game expectations from the fans’ perspective, including outcome uncertainty and overall game quality. For outcome uncertainty, we used the squared difference in the win probability and the Theil measure, separately. For overall game quality, we use the sum of the Elo ratings and the sum of the current league standing, separately.

$Z$  is a vector of variables that represents in-game performance since the highlight videos are usually available after the game, and viewers may be aware of the game outcome before watching it. This vector includes the sum of kills and absolute value of the difference in kills to determine whether fans prefer offensive (more kills) and one-sided games. We further assessed whether other performance statistics (assists and multiple kills) could affect the view counts.

<sup>2</sup> One game was canceled due to the COVID-19 pandemic.

<sup>3</sup> Note that a win is not determined by the kill difference. A team will win when it conquers the opponent’s base.

<sup>4</sup> LCK league assigns home and away team for every game for constructing double round robin system though.

TABLE 1 Summary statistics.

	Mean	SD	Min	Max
View count	127,234	88,737	24,562	717,819
Comment count	238	252	18	1,499
Sq. win difference	0.231	0.2	0	0.736
Theil	0.568	0.114	0.257	0.693
Sum of Elo ratings	3015	95.2	2715	3318
Sum of kills	55.3	16.7	22	114
Diff. of kills	15.1	8.47	0	42
Sum of assists	129	39.9	49	280
Diff. of assists	38.3	21.7	0	122
Sum of multiple kills	7.83	3.63	0	22
Diff. of multiple kills	3.83	2.53	0	13
Upset	0.28	0.449	0	1
Match duration	163	36.5	85	255
Evening match	0.494	0.5	0	1
Clip age (days)	774	364	213	1,379
Observations	629			

Sq., Squared; Prob., probability; Diff., difference.

$Z$  also includes the upset results variable to identify whether fans prefer watching matches with upset outcomes. We also used the interaction between the upset dummy and absolute difference in win probability to determine whether the impact is higher when a upset was more unpredictable.

$W$  is a vector of match-related characteristics, which include match duration, evening games, recentness of the highlights, day of the week fixed effects, and number of weeks within the tournament fixed effects.

$\alpha_i$  and  $\delta_j$  are the home team  $i$  and away team  $j$  fixed effects,  $\lambda_t$  captures the tournament fixed effects.  $\epsilon_{ijwt}$  is a heteroscedastic unobservable error term. The equation error term was assumed to be correlated within the home team  $i$ , and we clustered the standard errors accordingly. We performed multi-level ( $i, j$ , and the tournament) least square dummy variable (LSDV) regression.

As discussed earlier, the stars' effects were not well addressed in Equation (2) because relevant data (e.g., players' salary) was not observable. To address this issue, we performed the same multi-level LSDV regressions with home team-year and away team-year fixed effects. Both team-year fixed effects would capture the team and year specific variations, such as a fixed roster within a year for every LCK team.

On YouTube, fans can write a comment during or after watching a highlights video. To explore the determinants of the comment counts of the highlight videos, the following empirical model was formulated:

$$\ln(\text{commentcount})_{ijwt} = \beta_0 + X'\gamma + Z'\rho + W'\theta + \alpha_i + \delta_j + \lambda_t + \epsilon_{ijwt} \quad (3)$$

where  $\ln(\text{commentcount})_{ijwt}$  is the comment count of the LCK league game video of the home team  $i$  and away team  $j$ , in the week

$w$ , in the tournament  $t$ . Every other empirical setting was the same as that in Equation (2).

## 4. Results

Table 2 presents the main results of the logged view count from Equation (2). Column (1) presents the results of home team and away team fixed effects models, and Columns (2) and (3) include the results of the home team-year and away team-year fixed effects models. The estimated coefficients on the squared win probability difference were negative but not significant in Model (1) and (2), and significantly negative in Model (3). The negative coefficient indicates that LCK fans prefer unpredictable games as predicted by the UOH.

The estimated coefficients on the sum of the Elo ratings were positive and significant consistently, indicating that LCK fans prefer better quality games. The sum of kills was a significant predictor of view count. An additional kill increased the view count by 0.2%. The results indicate that fans prefer offensive games with more kills. However, the absolute value of the difference in kills had no significant impact on the highlights viewership, indicating that fans had no preference for one-sided games.

The estimated coefficients on upset results were positive and statistically significant; 8.2% more fans watched the highlights video when the game had an upset result. In addition, the interaction term between an upset and the absolute difference in win probability was positive and statistically significant. This suggests that more fans watch the highlights of upset results when the upset is more unpredictable.

The game duration did not affect the highlight view counts significantly. Evening games drove significantly more view counts, and around 16% more views were recorded for evening games. This may indicate that the LCK league arranges more popular games in the evening. Additionally, older videos have more view counts, as expected.

Using Model (3) in Table 2 as a main specification, we further assessed whether our results were sensitive with different measures. Table 3 presents the logged view count with home team-year and away team-year fixed effects. Column (1) shows our main results, Model (3) in Table 2, as a reference. The column (2) includes the Theil and sum of the current league standings as alternative measures for outcome uncertainty and game quality, respectively. Similar results were reported compared in Columns (1) and (2). The estimated coefficient on Theil was positive and significant, indicating that fans prefer unpredictable games. Additionally, the estimated coefficient on the sum of the current league standings was negative and significant, indicating that fans prefer high quality games with better ranked teams.

In Columns (3) to (5), we tested the impact of various in-game statistics on view counts. Column (3) includes the sum and difference of assists, instead of kills. While estimated coefficients on other variables remained unchanged, assists appear to have no effect on view counts. Column (4) includes the multiple kill counts as in-game performance statistics; it did not significantly affect view counts. Column (5) includes every in-game statistics in the model; kills, assists, and multiple kills. This model suggests that fans prefer more kills; one more kill increased the view count by 0.7%.

TABLE 2 Determinants of view counts.

	(1)	(2)	(3)
Dependent variable: logged view counts			
Sq. win difference	−0.018 (0.060)	−0.080 (0.061)	−0.147** (0.062)
Sum of Elo ratings	0.002*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
Sum of kills	0.002** (0.001)	0.002* (0.001)	0.002* (0.001)
Diff. of kills	−0.001 (0.001)	−0.001 (0.001)	−0.001 (0.001)
Upset	0.072** (0.032)	0.082** (0.031)	
Upset×Diff. win prob.			0.245*** (0.068)
Match duration	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Evening match	0.165*** (0.019)	0.161*** (0.019)	0.163*** (0.019)
Clip age	0.008* (0.004)	0.008* (0.004)	0.008* (0.004)
Home team fixed effects	Yes	No	No
Away team fixed effects	Yes	No	No
Home team-year fixed effects	No	Yes	Yes
Away team-year fixed effects	No	Yes	Yes
Tournament fixed effects	Yes	Yes	Yes
R-squared	0.829	0.862	0.864
N	629	629	629

\* $P < 0.1$ ; \*\* $P < 0.05$ ; \*\*\* $P < 0.01$ .  
Cluster-corrected standard errors at home team level in parentheses.  
Sq., Squared; Prob., probability; Diff., difference.

Furthermore, fans prefer less assists; one additional assist would reduce the view counts by 0.2%. Multiple kills did not change the view counts.

Finally, we identified the determinants of comment counts in LCK match highlight videos. Table 4 reports the results of the logged comment counts from Equation (3). Every model applies home team-year and away team-year fixed effects.

Results revealed similar fan preferences regarding outcome uncertainty and game quality for comment counts than for view counts. Estimated coefficients on squared win difference and Theil measure were significantly negative and positive, respectively. Fans preferred to write a comment when the game outcome was more uncertain. Parameter estimates on the Elo ratings (or current league standings) were positive (or negative) and statistically significant; fans posted more comments for high quality games. Estimated coefficients on the interaction between the upset dummy and absolute difference in win probability were positive and statistically significant. Upset results generated more attention from fans than

TABLE 3 Determinants of view counts with alternative measures.

	(1)	(2)	(3)	(4)	(5)
Dependent variable: logged view counts					
Sq. win difference	−0.147** (0.062)		−0.143** (0.061)	−0.140** (0.059)	−0.170** (0.059)
Theil		0.267** (0.100)			
Sum of Elo ratings	0.001*** (0.000)		0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
Sum of standings		−0.019*** (0.005)			
Sum of kills	0.002* (0.001)	0.002 (0.001)			0.007*** (0.002)
Diff. of kills	−0.001 (0.001)	−0.002 (0.001)			−0.004 (0.004)
Sum of assists			0.000 (0.000)		−0.002*** (0.001)
Diff. of assists			−0.001 (0.000)		0.001 (0.001)
Sum of multiple kills				0.003 (0.003)	−0.001 (0.003)
Diff. of multiple kills				−0.003 (0.005)	−0.000 (0.005)
Upset×Diff. win prob.	0.245*** (0.068)	0.246*** (0.067)	0.247*** (0.068)	0.247*** (0.069)	0.253*** (0.067)
Match duration	0.000 (0.000)	0.000 (0.000)	0.001 (0.000)	0.001*** (0.000)	0.000 (0.000)
Evening match	0.163*** (0.019)	0.158*** (0.018)	0.163*** (0.018)	0.164*** (0.019)	0.164*** (0.020)
Clip age	0.008* (0.004)	0.008 (0.005)	0.008* (0.004)	0.008 (0.004)	0.007 (0.004)
Home Team-year fixed effects	Yes	Yes	Yes	Yes	Yes
Away Team-year fixed effects	Yes	Yes	Yes	Yes	Yes
Tournament fixed effects	Yes	Yes	Yes	Yes	Yes
R-squared	0.864	0.862	0.862	0.862	0.865
N	629	629	629	629	629

Note: \* $P < 0.1$ ; \*\* $P < 0.05$ ; \*\*\* $P < 0.01$ .  
Cluster-corrected standard errors at home team level in parentheses.  
Sq., Squared; Prob., probability; Diff., difference.

usual outcome did, resulting in more posted comments. More comments are posted for evening games (26%). In-game statistics, such as kills, assists, multiple kills, match duration, and clip age did not affect the comment counts.

TABLE 4 Determinants of comments counts.

	(1)	(2)	(3)
Dependent variable: logged comment counts			
Sq. win difference	−0.428*** (0.086)		−0.447*** (0.101)
Theil		0.760*** (0.153)	
Sum of Elo ratings	0.002*** (0.000)		0.002*** (0.000)
Sum of standings		−0.022*** (0.007)	
Sum of kills	0.001 (0.002)	0.001 (0.001)	0.004 (0.003)
Diff. of kills	0.001 (0.002)	0.000 (0.002)	0.005 (0.004)
Sum of assists			−0.002 (0.001)
Diff. of assists			−0.001 (0.002)
Sum of multiple kills			0.009 (0.007)
Diff. of multiple kills			−0.009 (0.008)
Upset×Diff. win prob.	1.091*** (0.099)	1.094*** (0.101)	1.107*** (0.096)
Match duration	−0.000 (0.001)	−0.000 (0.001)	−0.000 (0.001)
Evening match	0.266*** (0.035)	0.263*** (0.034)	0.269*** (0.036)
Clip age	0.006 (0.009)	0.006 (0.009)	0.004 (0.009)
Home team-year fixed effects	Yes	Yes	Yes
Away team-year fixed effects	Yes	Yes	Yes
Tournament fixed effects	Yes	Yes	Yes
R-squared	0.804	0.800	0.805
N	629	629	629

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01.

Cluster-corrected standard errors at home team level in parentheses.

Sq., squared; Prob., probability; Diff., difference.

## 5. Discussion

This study attempted to identify the determinants of the LCK league highlight views and comment counts. Using the data from the LCK channel on YouTube, we discovered that outcome uncertainty, game quality, sum of kills and assists, upset results, and evening matches were associated with view counts. For comment

counts, outcome uncertainty, game quality, upset results, and evening matches were identified as determinants.

Regarding outcome uncertainty, both the squared win probability difference and Theil measure were significantly associated with the view and comment counts. The results support the UOH for highlight viewers, which was consistent with those of previous studies on TV viewership for traditional sports (Paul and Weinbach, 2007; Tainsky, 2010; Cox, 2018).<sup>5</sup> These results are consistent with those of a study on Korean soccer league live attendees (Sung and Pyun, 2023).

The game quality influences the highlight views and comment counts. This indicates that fans prefer watching games involving a team with higher Elo ratings or lower league standings (i.e., a better team). This result is consistent with those of previous findings on live attendees (Buraimo and Simmons, 2008; Benz et al., 2009; DeSchrive et al., 2016), TV viewership (Kim et al., 2021; Wills et al., 2022), and esports replays (Wang, 2022).

The sum of the kills was a strong predictor of highlight views. LCK fans, or at least highlight viewers prefer offensive games involving more kills than defensive games. This result is consistent with that of the previous findings of a positive association between in-game performance and game attendance (Han et al., 2021; Johnson, 2021). The sum of kills is comparable to the scores in traditional sporting games. Previous studies have demonstrated that sports fans prefer to watch exciting games with high scores than boring games with low scores (Paul and Weinbach, 2007; Alavy et al., 2010). Because one of the key motivations of playing and consuming esports media is hedonic motivation, the sum of kills which may increase viewers' arousal and enjoyment level, predicts the highlight views (Jang and Byon, 2020). The sum of assists was negatively associated with view counts, indicating that fans prefer to watch solo performances, not teamwork. This may indicate that fans want to acquire skills by watching gameplays, mostly solo performances (Sjöblom and Hamari, 2017). On the other hand, the results may reveal the nature of highlight videos. A highlight video of an offensive game with many kills contains more fighting moments that highlight viewers want to watch.

Upset results have a strong impact on highlight views, and the impact increases when the upset results are unexpected. This indicates that fans prefer to watch highlight clips and post comments when the underdogs defeat the favorites. This result is consistent with the one in Butler and Butler (2023), and supports the arguments presented by Card and Dahl (2011), Ge (2018), and Matti (2021) that an unexpected outcome (i.e., a game with upset result) can activate an emotional cue and influence the subsequent actions of the fans. In our context, the unexpected wins and losses might have generated emotional cues, triggering the subsequent behavior of watching highlights and posting comments.

Deposition theory suggests that enjoyment from watching a game depends on an emotional investment in a favorite team with the preferred game outcome (Raney, 2013). This may suggest that highlight viewers are more likely to be fans of the winning team. This could be attributed to the fact that the decision to watch highlight videos is made after the game ends when the fans already

<sup>5</sup> Note that previous studies on the England Premier League TV viewership have reported no evidence for supporting UOH (Buraimo and Simmons, 2015; Scelles, 2017).

know the results. Thus, fans would watch a highlights or post a comment more if the game result is their preferred outcome with more kills. Moreover, an upset win may drive a huge enjoyment to fans.

Although outcome uncertainty, game quality, and upset results affect the highlight views and comment counts in a similar manner, in-game performance does not alter comment counts. Fan behaviors on social media like YouTube can be categorized as consuming, contributing, and creating (Muntinga et al., 2011). Among these behaviors, consuming generates the lowest involvement such as watching a clip. Contributing generates mid-level involvement, such as generating an interaction between users, including posting comments (Kim and Yang, 2017).<sup>6</sup> Using a similar framework, Buzeta et al. (2020) reported different impacts of motivation with uses and gratifications theory on user behaviors in broadcasting social media (e.g., YouTube) (Muntinga et al., 2011). Motivating factors, such as empowerment and remuneration, affect the consumption (watching a clip in our study) and contribution (posting a comment in our study) of media in a similar way. Other motivating factors, including entertainment, integration and social interaction, and information only affect the consumption, but not the contribution, of media content. Our results indicate that before-the-game expectations and upset results trigger remuneration motivations (i.e., the fans' desire), thus affecting view and comment counts in the same way. However, in-game performances may trigger information motivations (i.e., detailed game information). Thus, only view counts were affected by these factors.

## 6. Conclusion

We aimed to understand esports viewers' consumer behavior by exploring the determinants of LCK highlight views and comments. First, among the before-game expectations, outcome uncertainty and the game quality were significantly associated with view and comment counts. This indicates that fans prefer watching unpredictable games and those with high quality teams. Second, the upset results were significant predictors of esports' highlight views and comment counts. Thus, fans enjoy watching the underdogs win. Finally, in-game statistics only affect the view counts; fans prefer watching offensive games with more kills, and a solo performance rather than teamwork.

Using fan demand for highlight video clips, we examined their preferences on in-game performance. This was not adequately evaluated in existing literature because game viewers (either live attendees or TV viewers) do not know these factors before watching the game. Although we only evaluated the impact of basic in-game statistics in the LoL game, several other factors, such as gained/spent gold, killed dragons, and total damages to the opponents are also available owing to the native digital nature of esports (Taylor, 2020). Thus, preference of esports in-game statistics requires further testing.

Like other studies on TV viewership (Cox, 2018) and esports replays (Wang, 2022), this study could not identify if each viewer was a fan of one team, fan of the other team, or had no favorites.

Using full text comments and user identification, fans can be appropriately identified (Wang and Fan, 2022). As the before-the-game expectation, in-game performance, and game outcomes are applied in the opposite way depending on which team a fan supports (e.g., one team winning means the opponent losing), fan identification may be the key to understanding SLSS viewership in future research.

The findings of this study can act as guidelines for the highlight clips producers. Recently, the demand for highlights has increased among sports fans, with several sports leagues such as the National Basketball Association, National Hockey League, and Korean Baseball Organization providing highlights using artificial intelligence (AI) to meet the high demands. AI highlights are technology-based automated highlight videos generated without a human editor, for the sole purpose of generating a large number of clips in a short time. In addition to developing AI algorithms, the study results can be used for generating customized highlights for esports fans.

Further research is required to obtain more practical implications. Bae and Kim (2022) demonstrated that highlights viewership often leads to an increased live game viewership. Furthermore, the LCK league may be able to attract new fans using highlight videos. This relationship can be tested via matching live game viewership data to that of highlight view counts. Although YouTube is one of the most popular SLSS in Korea, there are several other similar services such as Twitch and Afreeca TV. The quality of the highlights video also affects watching decisions. However, this was not deliberated on in this study. Moreover, there are potential variables, such as star player effects, that might affect esports viewers. We could not include them in the model due to the limitation of data accessibility. Future research should consider more factors that may impact esports demands. Finally, since we only focused on a single esports, LoL, future research should examine determinants in other esports such as Dota2 or Overwatch.

## Data availability statement

Publicly available datasets were analyzed in this study. The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Author contributions

YR wrote the manuscript draft and performed the initial data analysis. HH and JJ collected and organized the data and assisted with statistical analyses. WJ and GL contributed to the conception and design of the study and assisted with editing the manuscript. HP provided supervision over the project, analyzed the data, and edited the manuscript as a corresponding author. All authors contributed to the article and approved the submitted version.

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<sup>6</sup> Creating produces the highest involvement, such as sharing a clip, which was not observed in this study.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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# Passionate hearts, torn loyalties: navigating the interplay between fandom and romance

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**Introduction:** The current study presents a thorough investigation of the attitudes and emotions expressed by the spouses and girlfriends of sports fans within the context of their long-term relationships. Its primary objective is to explore the potential ramifications that surface when individuals become deeply invested in a competitive sport, demonstrating intense emotional connections, broad knowledge, unwavering loyalty, and active engagement in fan-related activities.

**Methods:** The research methodology applied in this study involved conducting semi-structured interviews with a sample of twelve spouses and girlfriends of fans.

**Results:** The principal findings elucidate four distinct themes that shed light on the intersection of fandom and romantic relationships. These themes include: “that’s what I signed up for”; “fandom as a gendered activity”; “the good, the bad, and the ugly”; and “sports fandom as an addiction.”

**Discussion:** The study concludes by highlighting the crucial cultural context at work. The social criticism expressed by the interviewees toward non-traditional gender behaviors displayed by their partners serves as a cautionary message. These criticisms aim to preserve and uphold male dominance in sports, thereby reinforcing the notion of their unquestioned supremacy. Consequently, we argue that, within this context, latent aggressive behavior in men is perceived as a strategy to maintain their monopolistic control over sports domains.

## KEYWORDS

sports fandom, Israel, romantic relationship, ardent fans, spouses

## Introduction

A man can change anything: his face, his family, his girlfriend, his religion, his God. But there is something a man can not change. A man can not change his passion (Campanella, 2009).

This quote from the Argentinian film *The Secret in Their Eyes* vividly captures the essence of an ardent sports fan’s commitment to their club. It portrays a lifestyle deeply infused with fandom, where their devotion is not merely a hobby, but also pervades their attitudes behaviors, and even their schedules. Their fandom extends into their choice of friends, the colors they prefer for their clothing and other items, and their patterns of consumption. As such, the emotional, financial, and time investments that fans pour into their beloved club often come into conflict with other aspects of their daily lives. One such potential conflict, and the focus of this paper, is the impact of ardent fandom on romantic relationships.

We explore how a fan's significant other navigates the symbolic competition between themselves and the club. Accordingly, this paper aims to offer an initial exploration of the attitudes and emotions of fans' spouses and girlfriends as they maintain long-lasting relationships with these passionate sports enthusiasts.

## Sports fans

Sports fandom is a widespread and enthralling phenomenon with considerable impact on contemporary society, engaging millions of individuals globally and inspiring a degree of commitment likened to religious devotion (Dwyer and Drayer, 2010; Tamir, 2018). To thoroughly understand sports fandom, it is crucial to consider its cognitive, affective, and behavioral dimensions. James and Ridinger (2002) proposed a significant framework defining a sports fan, emphasizing self-identification, supportive attitudes, and observable behaviors as key elements. Fans forge deep emotional bonds with the teams or individuals they support, nurturing a strong sense of unity. They actively indulge in consuming news, sharing experiences via social networks, and distinguishing themselves from those possessing only casual interest in a team or player (Hull and Lewis, 2014).

Various forms of fandom have been identified and categorized by researchers, predicated on the degree of identification fans exhibit toward their team (Giulianotti, 2002; Billings et al., 2018; Onwumechili, 2018; Van Driel et al., 2019; Levental et al., 2022). Wann et al. (2001) suggest a framework that differentiates highly identified fans from mere sports spectators. Highly identified fans are deeply committed to a specific sport, team, or athlete, demonstrating strong emotional attachment, extensive knowledge, steadfast loyalty, and active participation in fan activities (Levental et al., 2021b). In contrast, sports spectators display a more passive, casual interest, viewing sports events without the same intensity of emotional connection or active involvement. The team holds remarkable stability in the fans' lives, often assuming priority in disputes with other identities (Porat, 2010).

## Characteristics of sports fans

The characteristics of sports fans have been extensively explored by researchers such as Wann et al. (2001) and James and Ridinger (2002) within the frameworks of sports fandom and fan identification. These frameworks are built upon psychological theories such as social identity theory (Tajfel and Turner, 1986) and self-determination theory (Deci and Ryan, 1985), enabling a comprehensive understanding of the motivations and behaviors exhibited by sports fans. The key features of a sports fan revolve around their motivations, identification, and behaviors (Wann et al., 2001; James and Ridinger, 2002).

Motivations for sports fandom encompass diverse factors, including seeking entertainment, experiencing eustress, forming group affiliations, enhancing self-esteem, appreciating esthetics, seeking escapism, valuing family connections, and considering economic factors (Funk et al., 2012). Men often find motivation in the excitement, arousal, self-worth, and aesthetic appeal of sports, while women are more motivated by social interactions

and the opportunity to spend time with friends and family (Gantz and Wenner, 1991; Wann et al., 1999a,b, 2001). Additionally, research has identified other motivations such as empathy, seeking action, acquiring knowledge, and engaging in social interaction (Mastromartino and Zhang, 2020).

Identification plays a crucial role in sports fandom, indicating the psychological connection fans have with a specific team or sport. Highly identified fans demonstrate a strong sense of loyalty, knowledge, and attachment to fellow fans, often expressing their support through visible behaviors like wearing team colors (Fillis and Mackay, 2014). This identification with a team or sport becomes an integral part of a fan's identity, fostering a sense of belonging and community within the fan base. It is important to recognize that identification extends not only to the team or sport but also to other fans, as fanship and fandom encompass both individual and collective aspects (Wann et al., 2001).

Fans' behaviors in sports fandom encompass various activities such as attending games, cheering, acquiring knowledge, and displaying team colors (Wakefield and Sloan, 1995). Attendance at games is often associated with higher levels of loyalty. These behaviors allow fans to actively engage with their favorite teams or sports, showing their support and contributing to the overall enjoyment of being a sports fan (Wann et al., 2001; James and Ridinger, 2002).

## Hobbies and addiction

Engaging in sports fandom as a hobby can bring joy, entertainment, and a sense of fulfillment and meaning to individuals (Zhigang et al., 2022). It offers opportunities for social interaction and personal growth, as fans admire the skills and teamwork of athletes (Kim and Kim, 2020). However, it is essential to be aware of the potential for addictive behavior. Research has shown that activities like shopping, video gaming, television watching, internet surfing, texting, and even eating chocolate can transition from enjoyable pastimes to compulsions and addictions (Kubey and Csikszentmihalyi, 2004; Ridgway et al., 2008; Huang and Leung, 2009).

Compulsive sport consumption is characterized by habitual and obsessive engagement with sports, often with a sense of limited control (Aiken et al., 2018). It can lead to negative internal feelings such as guilt, regret, and conflict, as well as external consequences like strained relationships and professional life (Simmons et al., 2011). Compulsive sport consumption shares similarities with addiction, involving obsessive-compulsive tendencies and difficulties with impulse control (Huang and Leung, 2009). Several forces contribute to the development of excessive sport consumption as a compulsion. Internally, fan values, attitudes, and identities shape loyalty and positive self-esteem (Bee and Kahle, 2006; Aiken et al., 2018). Externally, social forces promote social cohesion and a sense of belonging, encouraging excessive sport consumption (Branscombe and Wann, 1991; Campbell et al., 2004). Media and marketing cues also play a role, bombarding fans through various channels and fostering engagement with diverse sports (Fullerton and Punj, 2004; Prentice and Cotte, 2015; Hing et al., 2016).

In today's technology-driven society, where sports are easily accessible through multiple media platforms, many fans struggle

to control their consumption and may prioritize it over other responsibilities (Gubar, 2015). Recognizing warning signs of excessive involvement in sports fandom, such as neglecting responsibilities, seeking constant validation from sports outcomes, or experiencing distress when unable to follow events, is crucial as they may indicate an unhealthy attachment (Mastromartino and Zhang, 2020).

## The conflict between fandom and family

Balancing a passion for sports with family commitments presents challenges for sports fans (Madsen and Hammond, 2006). Conflicts may arise when sports events clash with significant family occasions or when the time and emotional investment in sports compromise quality time with loved ones. Individuals have multiple roles, including being a parent, spouse, student, and sports fan, each demanding time, energy, and limited resources (Grawitch et al., 2010). These roles can conflict with each other, leading to interrole conflict (Greenhaus and Beutell, 1985). While sports fandom may initially seem harmless, it can become addictive and disrupt one's life (Smith, 1988).

Dysfunctional fandom occurs when a fan's being hinders fulfilling normal role behaviors outside of sports, negatively impacting family life and relationships (Simmons and Greenwell, 2014; Smith, 2017). Devoting significant time, money, and energy to the fan role may result in neglecting family obligations (Lapierre et al., 2008; Vallerand et al., 2008a). Conflicts between the fan and family roles can arise when sports events take precedence over family events or when negative emotions following a team loss affect interactions with loved ones (Wann et al., 2001; Wann and Waddill, 2013). Moreover, highly identified fans, deeply invested in their fan role, often spend more time and engage in support behaviors that contribute to interrole conflict (Trail et al., 2003; Wann and Waddill, 2013). The financial commitment associated with being a fan can create conflict within the family, as the resources allocated to the fan role may be seen as hindering financial obligations (Wann and Branscombe, 1993; Downs and Woolrych, 2010). Interrole conflict has a negative impact on family satisfaction and overall life satisfaction (Carlson and Kacmar, 2000; Judge et al., 2006).

Fan-family conflict arises when the time and emotional investment in being a sports fan clash with family commitments and relationships (Wenner, 2002). This conflict can manifest as neglecting family obligations or experiencing negative emotions that affect interactions with loved ones (Simmons and Greenwell, 2014), resulting in diminished relationship satisfaction and strained family functioning (John, 2004). Various types of fan-family conflict have been identified in the literature, including time-based, strain-based, behavior-based, and economic-based conflicts (Vallerand et al., 2008b; Laß and Wooden, 2023). Time-based conflict occurs when multiple roles compete for limited time, while strain-based conflict arises when stress from one role spills over and affects performance in another. Behavior-based conflict occurs when behavioral expectations of different roles are incompatible, and economic-based conflict arises when financial demands of the fan and family roles conflict (Downs and Woolrych, 2010).

## Sports fandom and gender in Israel

Considering the global nature of sports, sports fandom exhibits similar characteristics across different countries and among individuals. However, the dynamics of this relationship can be significantly influenced by local cultural and social contexts. In the case of Israel, where research on the impact of sports fandom on family life is limited, it is crucial to examine this phenomenon within the unique gender perceptions prevalent in society. Scholarly investigations into the relationship between sports and gender in Israel primarily focus on examining gender power dynamics and their influence on identity formation. Kay and Jeanes (2010) argue that as women increasingly participate in traditionally male-dominated professions and activities, sports have become an important arena for gender-related struggles.

The discourse surrounding women's involvement in sports in Israel, like in other spheres, often marginalizes their activities compared to those of men. Discriminatory language emerges in discussions that differentiate and prioritize various activity categories, using terms such as "politics" versus "women's politics," "empowerment" versus "women's empowerment," and "leadership" versus "women's leadership." This gender bias is pervasive in the realm of sports and reinforces the intertwining of masculinity with national identity. As a result, male-dominated sports continue to be regarded as the unquestioned standard of excellence (Lev and Hertzog, 2022). Furthermore, it is important to highlight that male engagement in sports activities often adopts military symbolism, serving as a formative and empowering metaphor (Lev and Hertzog, 2017; Hertzog and Lev, 2019). This association is not surprising given the significant role of military service in the maturation process of young Israelis, which shapes their consciousness and blurs the boundaries between the individual, family, society, nation, and state (Ben-Eliezer, 1995; Sasson-Levy and Hartal, 2018).

In Israel, sports fandom also holds a prominent and integral place within the cultural and social tapestry (Levental et al., 2021a; Tamir and Galily, 2021), reflecting a robust interest in various sports, including football, basketball, and martial arts, underscoring its profound role in society (Galily and Samuel-Azran, 2021). This fervor is ignited by the accomplishments of national teams and the prominence of local leagues (Porat, 2010; Lev and Weinish, 2020). Sports teams serve as unifying symbols within Israel's diverse and multicultural community, adding depth and complexity to the experiences of sports enthusiasts (Lev and Zach, 2018). This unique Israeli context not only showcases the passion for sports but also provides a rich foundation for scrutinizing the dynamics of sports fandom and its far-reaching societal implications. In essence, it exemplifies how sports, like football on a global scale, transcends boundaries and serves as a powerful force that connects people from various backgrounds and walks of life.

## Materials and methods

### Instrumentation and participants

To explore how spouses and girlfriends of avid sports fans perceive their relationships, we conducted semi-structured

interviews with twelve individuals involved with ardent sports enthusiasts. We define ardent fans as sports supporters who spend, on average, at least 2 h a day engaged in fan-related activities, such as attending games and practices or participating in fan committees. We adopted [Giulianotti's \(2002\)](#) characterization of ardent sports supporters as fans who demonstrate prolonged support and solidarity for a team, displaying unconditional love for their team and investing considerable time and emotions throughout the year.

The first two interviewees were approached based on personal acquaintance of the researchers. After the interview, the snowball method was used to locate additional interviewees. It should be noted that this sampling method is particularly effective when the research topic is related to personal aspects or related to a closed social group ([Noy, 2008](#)). The participants in this study were Israeli women aged between 26 and 40, each in a relationship for at least a year with a male ardent sports fan. These women were asked primarily about their perceptions, beliefs, and expectations regarding their relationships. Sample questions included, “How does it feel to be in a relationship with an ardent sports fan?” and “To what degree are you involved in your spouse's sports world?”

Each interview ranged from 60 to 90 min in duration and was conducted by the researchers. Interviews took place in various locations, either in a quiet coffee shop or at the interviewees' homes. They were all recorded and initially conducted in Hebrew but were subsequently translated into English by the researchers for analysis. From these interviews, four overarching themes emerged: “that's what I signed up for”; “fandom as a gendered activity”; “the good, the bad, and the ugly”; and “sports fandom as an addiction.” The study concludes by underlining the significant influence of cultural context in shaping these dynamics.

## Data analysis

To analyze the data, we employed the thematic analysis method ([Braun et al., 2016](#)). This approach allows for the identification, interpretation, and explanation of themes within a dataset. The researchers conducted an immersive exploration of the data by diving into the transcripts, coding the data, and generating themes. We adopted an inductive approach where themes and patterns were allowed to emerge organically from the data itself. Moreover, we engaged with the data at the level of semantic focus. Through the organization of data into higher-order themes, certain codes were examined and subsequently amalgamated to shape overarching themes. The overarching themes identified were: sports fandom perpetuating gender inequality within the family; the “love and hate” relationship inspired by sports fandom; and the implications of ardent sports fandom within the relationship. Following the creation of these themes, we aimed to establish coherent connections among the categories. This required an exploration of the relationships between the themes and an understanding of how they interlinked to form a broader representation of the data.

As we described and reflected on these themes, we utilized existing literature to link them to the broader human experience of

ardent sports fandom within the socio-cultural perspective, thereby providing a comprehensive view of the findings.

## Assurance of quality

Ethical considerations necessitated several steps, as recommended by scholars such as [Birt et al. \(2016\)](#). These steps included obtaining signed consent forms from the participants, indicating their voluntary agreement to participate in the study, as well as conducting member checking to seek the participants' validation of the data analysis. Member checking was employed to enhance the credibility and trustworthiness of the research findings. Although this process can be viewed as intricate and potentially controversial, careful attention was given to providing participants with an open platform for commenting and criticizing. The first author of the study facilitated this process by sharing audio recordings and draft accounts of the interviews with the participants, and their input was incorporated into the final published paper. By employing this approach, participants were afforded the opportunity to review and approve their contributions throughout the research process ([Creswell, 2009](#)). However, it is important to note, following the guidance of [Sparkes and Smith \(2013\)](#), that the author did not consider participants' feedback as direct validation or refutation of their inferences. Rather, it served as an additional layer of information and data to enrich the study.

## Findings and discussion

### That's what I signed up for

The first-order theme that emerged from the interviews was the early awareness of the magnitude of the fandom in their partners' identities and daily lives. Because it is not visible to others, a sports fan's devotion may be somewhat concealed. Not all interactions with friends or following the news about a favorite team or player occur publicly; instead, they frequently happen privately and according to the individual's time preferences. Match viewing, on the other hand, necessitates continuous and lengthy time that is scheduled on a regular basis. However, it is done approximately once per week during the game season. Nonetheless, the interviewees noted that it was brought up by their partners early in the relationship and even during the first date. As Sarah mentioned:

Already on our first date, he presented it in such a way that it is an issue and that he will not give it up for anyone. I respect that. I try to respect that because I understand that it is important that everyone has their own things in a relationship. It is good that he was open about it from the beginning so I would know what I am getting into.

Because this issue was present from the beginning, it resulted in two important perceptions. First, because they decided to start the relationship after learning about their partner's devotion, they saw it as an inherent part of who he is. Therefore, they do not

necessarily see it as a personality flaw but rather yet another quality of their significant other. Helen even describes it as a virtue:

From the beginning, I knew that it is something that fills him and gives him confidence, and I think that confidence stays with him in other aspects of life, such as at work, being a good salesman. So I see it in a good way, having a hobby that gives so much and allows him to develop as well.

Maya articulated a similar viewpoint:

I think it points to some passionate component of his character. I can even say it was kind of a turn-on to see the intensity, his ability to show emotions, and his willingness to commit to something.

Second, this early awareness makes them feel like they are unable to criticize it. As Ruthy said:

We have known each other since high school. I am aware of this problem of his. Even back then, we used to argue about it. So, I knew what I signed up for, I guess I can not really complain.

Maya shared the same viewpoint:

Mistakes were made! (laughing). Even though I may not have understood the gravity of the situation right away, I was aware of its existence. Honestly, I thought it was something I could live with, and here I am doing just that. I can not get mad at him right now or accuse him of something that was there from the beginning. Not after 6 years.

According to the findings, even though this behavior significantly impacts the interviewees' lives, they do not perceive it as a significant barrier to a successful partnership. They contend that they occasionally feel they must avoid casting this characteristic in a particularly unfavorable light because doing so would imply that they do not respect a significant aspect of their partner's personality. The early recognition of a partner's deep-seated fandom and subsequent adaptation align with contemporary psychological understanding. Cognitive dissonance theory suggests that individuals strive for internal consistency and adjust their cognitions when faced with dissonance-inducing information, such as a partner's intense fandom, to reinstate cognitive equilibrium (Festinger, 1962; Harmon-Jones et al., 2015). This sheds light on why interviewees view their partners' fandom as a fundamental and positive attribute. Additionally, the principle of selective perception emerges as interviewees frame their partners' fandom in a positive light, emphasizing its contribution to personal growth or as a virtue, likely employing this biased perception as a coping strategy to sustain relationship harmony (Bruner, 1957; Hirt and Clarkson, 2011). The sunk cost effect may explain interviewees' hesitation to critique their partners' fandom, as their investment in the relationship despite knowing the extent of the fandom leads them to avoid expressing negative viewpoints that may question their initial decision to

enter the relationship (Arkes and Blumer, 1985; Ronayne et al., 2021).

## Fandom as a gendered activity

In many Western societies, women participate less frequently in sports than men do (Deaner et al., 2016), and they are also less involved in the world of sports fandom (Pfister, 2010). This can be attributed to social norms that associate sports-related activities with masculinity (Hertzog and Lev, 2019). The participants in the current study are aware of this widely held perception of sports and can relate to it in the context of their partners' fervent support. The interviewees occasionally describe certain behaviors as masculine while adopting a feminine stance toward others. For example, as Helen says:

I do not really care about sports. I just can not relate to that. I prefer cooking for my kids, playing with them, helping them with homework. Be a mom. I admit that when he watches his team, he is not exactly a dad, and because of this, I do not want to get into this whole thing. I do not want sports to take over the other things I do.

A similar attitude can be found in Mia's words:

When he watches football, I do something of my own, like taking a long shower. I really love. I also take care of the house, like washing dishes, doing laundry, etc. I know how important it is to him, so I really try to let him do his thing, and I take care of the housework.

In addition to the apparent distinctions between each partner's activities, the gendered nature of sports fandom often includes a component of commitment or exclusivity. For instance, the general perception is that watching sports is an activity that must be undertaken without interruption, often rendering the partner physically or mentally unavailable. In contrast, the wife can juggle family responsibilities, such as caring for children, while simultaneously engaging in other leisure activities. As Nily puts it:

Yesterday I made plans to meet my friend in a café. In the end, I found myself meeting with her at my place instead because he wanted to go and watch the game with a friend of his, and someone had to watch over the kids. And above all, it was not even Beitar's (Jerusalem) game, it is not his team. It drove me crazy.

Under the gendered lens of fandom, the interviewees point to somewhat chauvinistic behavior when it comes to practicing fandom. Many of them reported that their partners actively discourage them from participating in their fandom activities, including watching games together. Ruthy comments on this:

He never gets me into the world of basketball or shares stuff related to that with me, so I just ignore it. He's convinced that

I will not understand or will not be interested, so he's not really trying to involve me.

Throughout the interviews, there were numerous instances where interviewees brought up the perceived inability to comprehend the sport in-depth. For example, Nurit said:

I can sit and watch football with him, but he does not always go along with it, especially when he is with friends. At the last World Cup, all his friends came to our house, and I wanted to sit with them for a while. I said something about Messi, and my husband's friend said that I was just interested in the looks of the players and not because I am interested in the World Cup. After that, I decided not to sit with my husband's friends anymore because they look down on me.

Eden adds,

He is truly not a chauvinist, but he turns into one as soon as it is about sports. I do not know how come, but he believes that women can not understand basketball or football just like men can not understand shopping or cooking. He knows how I feel about these primitive views. We fight quite a bit about it.

In the case of Mia's relationship, it does not even matter that she has been an active fan for many years:

I am a fan of Maccabi Tel Aviv Football Club. It was part of my childhood. It was something my father and I did together. It was fun to go with him to watch the games, even though I was the only girl. All of his friends came with their sons. But my husband, well, he thinks it's a men's only zone. He had several comments about it. It does not come naturally to him that I know stuff. Whenever I say something I am sure of, I feel like he's testing me. Like he thinks he knows better. As if I should be given his approval to even talk about it.

Participants describe their partners as adopting somewhat different personas while practicing their fandom. There seems to be a clear transition from their typical behaviors in daily life to those exhibited while engaging in fandom, which also influences their attitudes toward their partners. It appears to be a setting in which their partners feel free to adopt certain attitudes and behaviors. One participant compared this to her partner's out-of-character actions in the stands, where he shouts, curses, chants, and even cries—things he never does under ordinary circumstances. The experiences shared by the interviewees are consistent with extensive contemporary research (Esmonde et al., 2015; Lenneis and Pfister, 2015; Warner and Dixon, 2015) that highlights societal norms associating sports with masculinity. This bias results in limited participation of women in sports and their exclusion from sports fandom (Allison and Knoester, 2021). The accounts provided by the interviewees shed light on the chauvinistic behavior exhibited by their partners, who discourage their involvement in sports fandom activities, reflecting prevailing gender role expectations (Grappendorf et al., 2023). Moreover,

the findings allow us to discern how women's knowledge and interest in sports are often undermined or dismissed, perpetuating biased perceptions within sports fandom (Toffoletti, 2017; Grappendorf et al., 2023). These findings underscore the existence of gender-based disparities and prejudices in sports fandom and emphasize the need to address the underlying inequalities.

## The good, the bad, and the ugly

The third-order theme that emerged from the analysis concerns the realistic perspective of relationship dynamics. The interviewees describe their partners' fandom as a devotion that occupies a substantial portion of their lives. Simultaneously, they view it as a hobby that empowers their partners and can occasionally become a shared experience. In this regard, the women interviewed for this study note that fandom, and especially watching games, can present an opportunity for joint marital activity. Helen describes her efforts in this matter:

I stay in the living room and watch it (the game) with him. I want to be with him after spending the whole day separated. And I keep asking questions and show interest in the game. I learn slowly! I will not say that I fully understand but I am getting better. Sometimes he really wants me to sit next to him and watch it together as if he wants it to be our hobby.

Similarly, Dinah describes how watching sports can be turned into a social gathering:

There are games, for example, the Football World Cup. It was like a holiday here! We went to the grocery store together, bought snacks, and his friends came to our place to watch the games. We brought a projector, speakers. do not ask. I also watched with them, and some other wives too. It was a festival. I really enjoyed that period, I felt that there was something that connects us, something we are waiting for together.

On the other hand, the interviewees understood that their partners' primary motivation for shared activities was their interest in sports. Therefore, they knew their partners would pursue their fandom regardless. This understanding led to a conflict: should they embrace their partners' hobby, or let them engage freely in it, even if it comes at the expense of the relationship? As the findings suggest, the wives often accept that their husbands will be preoccupied with their fandom. Mia provides some illustrative examples:

He helps in the house chores, but when there's a match on, it is his priority, without a doubt. On the other hand, he knows that he must help in any way possible right after, and he knows he can not avoid it. So I put aside things I want him to do, and he does.

And Ruthy adds:

There's an unwritten agreement between us. He does not always help with the kids because he watches basketball, so when I have Pilates, he has to take care of the kids. We respect each other's hobbies and activities. The catch is that his' takes over much more.

Participants' attitudes are ambiguous as a result of this acceptance. They describe a wide variety of feelings, from apathy and avoidance to frustration. Yael stated this:

It is frustrating, but I got used to it. . . It is not the most fun or comfortable thing in the world to be married to someone who is an ardent sports fan that invests a lot of energy and time in it. It is hard, and you have to learn to live with it.

Alongside the opportunity to spend time together, or understanding that there will be times of separation, some interviewees claimed that their partner's fandom could be detrimental to the relationship. In other words, engaging in fandom does not only come at the expense of the relationship, but it might also hinder mutual support or strain their financial situation. Sarah provides an example of this:

He loves his club. So, if the team wins, he is feeling high, if it loses, he's down. like a depression. And let's say, once a year he flies abroad with his friends, and deep inside, in my heart, I go crazy. He travels to these "sport-things" and puts me in a lower priority because it means less money for us to fly and travel.

It should be stressed that this circumstance often arises when the interviewees believe their partner's interest has escalated into an obsession or addiction, a topic explored in the following theme. The insights shared by the partners offer an invaluable perspective into the complex dynamics of relationships influenced by intense fandom which often result in what [Lev and Zach \(2018\)](#) referred to as "conditional support." While their willingness to participate in shared activities and support their significant other's passion is evident, they face daunting challenges when fandom becomes dominant. Previous research, including studies by [Wakefield and Wann \(2006\)](#) and [Wann and Branscombe \(2010\)](#), has highlighted these dynamics, pointing to conflicts, frustration, and feelings of neglect when a partner's fandom takes precedence. These challenges echo in the experiences shared by interviewees, which are further substantiated by research from [Lim and Putnam \(2010\)](#). They, too, found partners of avid sports fans wrestling with similar issues, with fandom frequently overshadowing the relationship. Further, this complex interplay underscores the necessity of striking a balance between personal passions and shared responsibilities, which is crucial for sustaining a healthy relationship. Central to achieving this balance is the pivotal role of open communication, mutual understanding, and compromise, as these factors are integral to fostering a harmonious partnership amidst intense fandom ([Luellen and Wann, 2010](#); [Shtudiner et al., 2022](#)).

## Sport fandom as an addiction

It should be mentioned that the analogy of intense fandom being an addiction arose spontaneously during the interviews. Usually, this term was intended to highlight the magnitude of the emotional, financial, and temporal resources invested in the fandom. Helen pointed out the difference between "normal" and "addicted" fan:

He is definitely an addict. For example, I am also a fan but it is not the same thing at all. I have boundaries, and I take things in proportion. He is not. Nothing else is important if his club is playing, only the game. It is not a normative behavior for a married 42 years old with three kids. This addiction regularly comes at my expense.

Sarah adds to that:

I know it is an exaggerated comparison, but it is like it is some drug he needs to use to get through the week. So, he will not suffer from withdrawals. If he does not go to the games, the whole week is ruined. I think the addiction is also reflected in the fact that he is constantly checking the online sports sites, it is always there.

The interviewees described addiction in two ways: a sudden change in mood and its implications for oneself and others. The first is the impact of the games' outcomes on mood and behavior. Ruthy stated:

He does not get enough sleep because of it, and then he's not concentrated on work. Sometimes he's having trouble falling asleep after a bad result.

And Nily added:

If the team loses it is as if a disaster has happened. Like someone's died. The kids and I just know not to talk to him until the next day. He goes to bed nervous; I have not seen anything like that. Like an addiction, it affects him that much.

According to the findings, changes in mood among fans are directly and immediately influenced by game outcomes. This predictable pattern of emotional fluctuations makes it possible for individuals to manage their emotional responses. Another aspect of addiction is its impact on those around them. Mia elaborated on how her partner's fandom affects her and her schedule:

This addiction comes at my expense in a lot of cases, if there's something on TV related to his club, a match, a press conference, I do not know what, anything, then my stuff are automatically dismissed by him, that is, if I have an appointment or I want or need to do something, I have to give it up and be with the kids. because his club and football are always first priority. We had a lot of quarrels because of that.

Being the partner of an individual exhibiting addictive tendencies toward fandom, as evident from our interviews, can be a significant emotional challenge, much like living with a substance addict (Orford et al., 2010). The findings can demonstrate how living with a partner who is addicted to fandom can be emotionally challenging, like living with a substance addict. Partners often face the fan's compulsive dedication to the fandom, leading to neglect of family responsibilities and strained relationships due to the disproportionate allocation of resources (Fuschillo, 2020). Furthermore, the fan's withdrawal-like symptoms can disrupt domestic harmony and personal wellbeing, creating an environment of instability (Rudski et al., 2009). The emotional turbulence resulting from a team's loss can mirror the psychological distress associated with addiction, further impacting the relationship dynamics (Friedman, 2020). When fans also engage in risky behaviors such as gambling and substance abuse, it not only harms the fan but also cultivates an unpredictable, potentially unsafe environment for their partners (Wann and James, 2018; Archer, 2021). Despite these challenges, it should be pointed out that not every passionate fan demonstrates addictive patterns. However, when fandom significantly disrupts daily life and interpersonal relationships, seeking professional mental health support can be beneficial for all involved parties (Wakefield and Wann, 2006). After all, compulsive fandom dedication can lead to an unequal distribution of responsibilities, neglect of familial duties, and strained relationships due to an imbalanced commitment of resources (Orford et al., 2010). This addiction-like behavior often results in fans neglecting their partners and children, as well as spending excessive amounts of money on fandom-related activities (Fuschillo, 2020). Furthermore, fans may experience withdrawal-like symptoms when deprived of their fandom, leading to disruptions in domestic harmony and negative effects on personal wellbeing (Rudski et al., 2009). These symptoms can include irritability, anxiety, and depression (Weinstein et al., 2017). Additionally, as demonstrated, the emotional upheaval that fans experience following their team's loss can further strain interpersonal dynamics, causing feelings of sadness, anger, and frustration (Friedman, 2020).

## Concluding remarks

The primary objective of this study was to gain a comprehensive understanding of the perspectives and emotions expressed by the spouses and girlfriends of avid sports fans in relation to their enduring relationships. We intended to highlight the possible outcomes that emerge when individuals become deeply engrossed in a competitive sport, showcasing intense emotional bonds, wide-ranging knowledge, steadfast loyalty, and active engagement in fan-related activities.

As the findings indicate, the concept of social identification, as introduced by Tajfel and Turner (1978), is central to sports fandom, underscoring the psychological link between fans and their preferred team or sport. The fans in this study demonstrated high levels of identification revealing a deep sense of loyalty, knowledge, and attachment to their teams. This identification with a particular team or sport becomes a crucial part of a fan's identity, promoting a sense of belonging and fostering a

community within the larger fan base. This association with a specific team or sport becomes a crucial part of a fan's identity. As a result, the identification process with a sports team holds emotional significance, with fans' self-esteem often tied to this affiliation. In this context, the inflexible nature of identification not only risks jeopardizing romantic relationships but also mirrors a disconcerting reality that perpetuates gender inequality while marginalizing and undermining women's agency.

Furthermore, it is important to acknowledge that these findings are deeply embedded within a specific cultural context. The Israeli army, as a formidable institution that shapes gender disparities and power imbalances, perpetuates male dominance both internally and externally. Given that militarism occupies a foundational role in Israeli identity (Sasson-Levy and Hartal, 2018), the entrenched machismo culture within the military sustains and propagates the notion of male "superiority" and female dependency. This dynamic is also highly pertinent within recreational sports (Lev and Hertzog, 2022), where the biological and physiological elements of such activities contribute to their perception as inherently "natural" (Hertzog and Lev, 2019).

The social critique voiced by the interviewees against non-traditional gender behavior exhibited by their partners serves as a warning, aiming to protect and maintain male dominance in sports, hence reinforcing their unquestioned supremacy. Consequently, latent aggressive behavior in men is perceived as a means to preserve their exclusive domain over sports fields. It is vital to acknowledge that while such behaviors have been linked to relationship difficulties among fans, not all ardent fans display aggressive or addictive behaviors. However, if the intensity of fandom significantly interferes with daily life and relationships, it is advisable for all parties to consider seeking professional mental health support (Wakefield and Wann, 2006).

The findings presented in this study contribute to the psychosociological field of sports fandom, especially in exploring the connection between attitudes and emotions expressed by fans' partners in relation to their enduring relationships. As such, this study's implications should foster a deeper understanding and heightened awareness among avid sports fans prior to committing to serious relationships or formalizing existing ones. Romantic relationships in which one partner exhibits fervor necessitate a critical reassessment and reflection. Extending the discourse about striking a balance between passion and relationship responsibilities, relationship psychology offers a powerful tool for managing these challenges: the concept of a shared meaning system. As suggested by Gottman et al. (2015), this involves constructing a collective narrative that accommodates the needs and interests of both partners, thereby forging an interconnected network of shared goals and values.

In closing, it is important to note that the present study was conducted with a sample size of twelve fan spouses and girlfriends. Given that the expression of sports fandom within romantic relationships can differ across geographic and socio-economic contexts, the generalizability of this study is limited. Further research should encompass diverse backgrounds, examining various geographic locations and social milieus (e.g., religious groups and rural regions). Additionally, conducting a study specifically focusing on female sports fans in relationships with non-avid fans could provide an interesting counterpoint. Despite these limitations, we believe that the findings reported herein offer

valuable insights into understanding the complex nature of fans in romantic relationships as a universal phenomenon.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

The studies involving humans were approved by the Ethics Committee of Ohalo College, Israel (04/2019, code 01221). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

## Author contributions

All authors contributed equally to all stages of the manuscript, contributions encompass the conception and design of the

research, data acquisition and analysis, interpretation of results, drafting and critical revision of the manuscript, and final approval for submission.

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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# Online sports fans communities: humor, trivial knowledge, and anti-modern tendencies

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Recent technical developments and the widespread use of social networks have led to the emergence of a variety of online communities built around common interests. Among these virtual communities, one notable category revolves around sports fans. This conceptual article uses several examples of online sports fan communities in Israel to analyze their core elements. Within this context, the article focuses on the significance of humor, trivial knowledge, and counter-modern concepts as the key elements fostering unity among fans. Humor serves as a common thread that encourages interactions, also providing a platform for fans to showcase their niche knowledge, symbolizing their dedication to fan culture. Meanwhile, the prevalence of counter-modern inclinations within these communities highlights the fans' constant devotion to the sport, demonstrating a profound loyalty. Collectively, these elements signify a shift from supporting specific teams to becoming keen fans of the broader sporting domain.

## KEYWORDS

Israel, sports fandom, fans, online communities, humor, memes

## Introduction

Early in the 2009–2010 football season, Avi Luzon, the chairman of the Israel Football Association, said that, from his perspective, the quality of play in the Israeli league ranks sixth in all of Europe. As soon as this statement was released, criticism in the media and public sphere focused on Luzon's overblown adulation of Israeli football. Since then, this phrase has served as a metaphor for Israeli football fans' self-criticism and acceptance of the slightly subpar quality of Israeli sports compared to that of other nations. Many fans, however, do not bemoan this situation but rather accept it as a particular quality or, at the very least, do not view it as a hindrance to their enjoyment and fandom.

Fans naturally support a particular team and anticipate continual success from them. As a result, there is rivalry amongst supporters of various teams. But new fan communities have been formed in recent years, especially in light of online social networks. These do not cater to supporters of any particular club but rather to all Israeli football fans as a whole. These communities, covered in the current article, have created a new element of fan culture in place of the club's success. It encourages the idea of common interest and romanticizes sports' simplicity. In the context of Israeli football, this trend has led to the popularization of several online communities that allow any Hebrew-speaking football fan to participate. Among the most popular communities are *Kaduregel Shefel* (Low football, 25K followers, 10 posts per week on average), *Tsiyun 3* (3/10, 41K followers, 5 posts per week on average), *Kadureglanim sh'hunatiim and svirim* (reasonable and down-to-earth footballers, 71K followers, 10 posts per week on average), *memem of kaduregel* (Football memes, 24K followers, 5 posts per week on average), and *Kaduregel Shefel Miluim* (Low football reserves, 6K followers, 20 posts per week on average). By considering three topics—humor as a point

of commonality, the particular importance of marginal knowledge, and anti-modern tendencies—the current article aims to analyze the significance and characteristics of these online groups. To achieve this objective, approximately 100 popular posts from each group were incorporated, from the group's inception to August 2023. While this article draws its foundational concepts from Israeli online communities, it endeavors to analyze a sports fandom phenomenon that transcends geographic boundaries. Emphasizing the local cultural context enhances understanding of the specialized and cultural elements that reside within the broader framework.

## Humor as a common ground

In his book *“The Ecstasy of Communication”*, (1) argues that the modern world is characterized by a flow of recurring ideas and symbolic information through various communication outlets. One notable illustration of this idea is the relatively recent popularity of internet memes. Memes constitute a way of exchanging elements of cultural and social thoughts, which are virally communicated on various media platforms and channels (2). This phenomenon also relates to Baudrillard's *Simulacra*, which he defined as a reflection of real objects that generate, replicate, and exist as part of hyperreality (3). Memes, therefore, do not focus on the original context or meaning. However, they show the ability of various, usually anonymous, people to exhibit creativity in using the same template with slight alternations to create new, relatable shared content. Thus, social network sites are the medium; memes contain symbols, semiotics, and trivial knowledge; and humor is the common denominator on which this form of communication thrives.

Veatch (4) describes humor as the existence of two elements simultaneously: “The perceiver has in mind a predominating view of the situation as being normal” (164); “The perceiver has in mind a view of the situation as constituting a violation of a subjective moral principle that is, some affective commitment of the perceiver to the way something in the situation ought to be is violated” (163). According to Veatch, humor is based on a circumstance everyone can relate to, while presenting an understandable change or twist. In the context of memes, (5) notes that memes as a humorous tool require users' literacy of the subject and to be broadly accessible to diverse identities and perspectives. That is, a meme can serve as a point of connection for people from a wide range of backgrounds as long as it is relatable and understood. In the case of Israeli football, fans of different teams, socioeconomic statuses and places of living are brought together by their knowledge of local football.

*Hutza Me'ekshero* (Taken out of Context), a book by (6), was published in Israel in 2001. The book included a collection of absurd quotations from football coaches, players, and journalists. The book became a success, leading to the publication of four other similar books. One recurring figure in the books was Israeli striker Alon Mizrahi. Among his quotes were: “*I have nothing to prove, and I proved it*” and “*I would like to play in Spain or Europe*”. Fans in Israel unjustly viewed Mizrahi as a representation of an unintelligent footballer. As a result, his name frequently appeared in jokes, and his now-famous quotes

were repeated and paraphrased. Even outside the Israeli football sphere, Mizrahi was a relatable and well-understood “meme” in those early internet days. And supporters of all teams, including his own, got in on the joke and spread it throughout various platforms. This was the first significant instance of sports-related content providing humor-based interpersonal communication. It used humor and general knowledge of Israeli football figures and events as a connecting tool. The technological advancements of the internet, especially the rise of social media, further developed this phenomenon. By increasing the number of possible participants, the necessary knowledge to participate in the humorous exchange became more trivial and anecdotal.

According to Broughton (7), social media can fuel rivalries between fans of different teams. This is also apparent in the Israeli context, in which football fans maintain violent online discourse (8). The reason is that sports fandom requires dichotomic affiliations, and each team has its colors, history, symbols, players, and staff (9). Fans will show appreciation toward a player and defend his actions because he plays for their team and therefore is considered one of them. Alternatively, when the subject of a meme is not focusing on the quality of a specific team or a player, it does not incite conflict. Instead, it allows fans to come together to celebrate broader shared interests. Moreover, the common ground on which this humor thrives, as discussed in the following sections, is the trivial knowledge and the anti-modern tendencies that often include the perceived mediocrity of Israeli football. Martin and Ford (10) argue that humor has several social functions for individuals and groups. One of them is releasing prejudice and fostering social cohesion in intergroup relations. Due to the inherent competitiveness in sports, humor can be a powerful common ground on which different and even rival groups can cooperate. Humor-based communities and pages on social media dissolve the exclusivity between a fan and his favorite team and make him a fan of the sport in general. By creating, sharing, and liking Israeli football memes, one is not obliged to identify himself as a fan of a specific team but as a member of a larger social circle, including all football fans as a whole.

## Trivial knowledge as an indicator of fandom's quality

According to (11), complex jokes, to a certain extent, are perceived as funnier. Thus, referencing more trivial information in memes makes the readers perceive their quality as higher. The specificity of the football memes shifted the emphasis from well-known information to information that is only known to those with a thorough understanding of the sport. Moreover, knowledge is an essential part of the fans' identity. Sports fans, as well as in other fields, take pride in their devotion. Traditionally, hardcore fans were measured by their attendance in the stands, and those who followed the team on home and away games were considered the most loyal (12). However, given current tendencies in the globalization of sports, particularly football (13), some fans choose alternative ways of demonstrating their dedication (14). While some fans continue to support their team in the traditional way of

attending matches, others focus on the consumer aspect of fandom (15). In either case, fans' knowledge about the club's history, players, results, and current state of affairs is still highly valued (16). A high level of knowledge demonstrates a person's passion for the subject and the time he invests in his devotion. It is not exclusive to football fans or sports fans in general, but it is a universal indicator of dedication to a specific issue or field.

The rise in popularity of fantasy sports serves as the best illustration of the importance of knowledge and understanding in sports. At its core, fantasy sport is a game designed to test the participants' understanding of real-life performance. The most crucial element is a thorough knowledge of players' fitness, form, and abilities; teams' strategies, schedules, and momentum; and awareness of important statistics, rules, weather, etc. These, in addition to long-term planning and consistently good decision-making (17). According to (18), not only are good fantasy players experts in sports and use their knowledge for success in the game but the audience for displaying their knowledge-derived expertise in fantasy sports is made up of friends and competitors. Therefore, demonstrating deep knowledge of sports strengthens the self-perception and the perception of others about one's fandom.

Like fantasy sports, being part of the football meme culture requires familiarity with the best and less-known players. Knowing Messi or Ronaldo is banal, while being aware of a backup player in some mid-table team reflects depth. Furthermore, because everyone wishes to exhibit this depth, memes about the leading players in Israeli football seem much less popular than those that refer to retired players or those who play for low-ranking teams. The posts that create the most traffic on the humorous sports pages on Facebook usually involve name-dropping or mentioning semi-esoteric events. Thus, Liking or sharing a post about some player who retired two decades ago signals that one has understood the reference or allusion. The age range of the pages' members can also be inferred from the display of trivial knowledge. A sports fan born in the early 1980s might be familiar with the names of well-known football players like Lev Yashin or Just Fountain, but may not be familiar with their appearances. Thus, in 2023, referencing Israeli footballers from the 1990s might appeal to people 35 years of age and older. This target audience will recognize the name of the Israeli international footballer Pini Balily and be aware of his unique facial feature of thick eyebrows. Therefore, referencing his eyebrows allows users to exhibit knowledge by signaling that they understand this jest. Popularizing specific content contributes to defining the subculture of the online community and its demographic while helping create group cohesion based on semi-obscure knowledge as a symbol of value.

Memes are a widespread worldwide phenomenon and there are numerous groups on all social media sites, including Reddit, X, Instagram, and others, devoted to this kind of humor. On most websites, you may also find communities related to specific subjects like TV shows, music, various sports, and sports clubs. For instance, the "Football memes" group, which is active on Facebook and X, has more than a million subscribers. However, the characteristics reviewed so far, humor and trivial knowledge, are largely culture-dependent. The group begins to lose its local identity and communal traits as it

becomes more appealing to larger audiences. Consequently, a niche group will be seen as having more prestigious qualities and possessing more communal traits.

## Anti-modern tendencies and embracing mediocrity

Nostalgia is an integral part of sports fandom. It affects stadium architecture (19) and the design of uniforms (20) and shapes tourism motives and trends (21). Nostalgia is the intangible expression of sports heritage and is often linked with a subjective perception of simpler times and less alienation. Sports, in the eyes of the nostalgic fan, is not about money or worldwide fame but rather about emotions, pride, and local communal aspects (22). Nevertheless, the sports fans on the humorous sports pages on Facebook are not blinded by nostalgia. They understand that football today is better regarding the quality of play or the convenience of watching matches on television or in the stands. However, reminiscing and celebrating earlier sports has social advantages. Batcho (23) argues that nostalgia proclivity was associated with emotional and instrumental social coping and goal-directed methods such as planning, action, and positive reframing. Nostalgia can boost self-esteem, provide comfort and solace, and improve psychological well-being (24). Sports nostalgia allows a fan to maintain his apparent "pure" dedication to the sport. While sport is a multifaceted industry, reminiscing about the past buffers individuals from being linked with the contemporary characteristics of sports, such as mediatization, globalization, consumerism, commercialism, and even professionalism. Nonetheless, the nostalgic fan still proudly upholds archaic properties of sports, such as passion, devotion, and loyalty, all through a romantic prism.

The *Kaduregel Shefel* (low football) project, which has accounts on all major social media platforms, is one noteworthy example of this trend. This project, which now includes an online merchandise shop, tours, galleries, seminars, and more, is described by its creators as a cultural experience in Israeli and international low football leagues. It highlights football's simplicity, untainted by sports' modernity. It accomplishes this by focusing on two areas of football: traditional and esoteric. The first is football from the 1990s or 2000s, which is no longer relevant in today's sports. Aside from focusing on retiring players, it also showcases the aesthetics of stadiums, balls, mascots, magazines, and clothing design from that era. They do this by appealing to fans' nostalgic instincts. Nonetheless, the vital feature of the content is the humorous nature of outdated sports components. While recalling a great player may be nostalgic, displaying a club uniform and focusing on a sponsor no longer in business aims to demonstrate the absurd spectrum of fandom between sports laden with personal and cultural meaning and sport that is temporal and only relevant for a specific place and time. As I previously stated, it is comical since it is relatively obscure and requires anecdotal knowledge held by only a select demographic of football fans.

The second area of this project is esoteric football in Israel and around the world. The community's members share stories and

images of stadiums, players, and spectators from lower-tier leagues or regional competitions. Similar to other social media accounts like *varzeiroocial* on Instagram and *out of context* football onX, they touch on the minuscule incidents of the sport, snickering at those participating in it, and ridiculing the extreme seriousness with which some people consider it. This popular pattern stems from supporters' desire to undermine the sport's perceived strive for perfection. To demonstrate that people appreciate sports even if they are neither professional athletes nor supporters of unsuccessful lower-league teams. Adopting such an outlook provides a comparison between a supporter of an elite team in a top-tier league and one of an unpopular mid-table club in a local league regarding dedication to the sport and depth of understanding of it.

This is made possible by accepting mediocrity as a natural feature rather than something to be actively avoided. Recognizing mediocrity allows the fan to lessen expectations, put things in perspective, and turn flaws into an ordinary aspect of sports fandom. Thus, by employing humor, demonstrating knowledge, and eschewing professionalism, the fan is no longer required to defend his club's performance; instead, he can engage in an inclusive community of sports fans.

## From a supporter to a fan of the sports

After decades of research, the scholarly literature recommends numerous models for categorizing sports fans based on their motivations, behaviors, and interests (15, 25, 26). They all, however, refer to sports fans who follow and support a certain team. Even when there is a low sense of attachment, as in the case of new fans who follow a club's recent success or because of an interest in a particular player, "the sports fan" is usually a supporter of a particular team rather than the sport as a whole. Although some people support two clubs, one local and one from a top foreign league, supporters choose their favorite club based on various factors and develop loyalty to it (27). Nonetheless, along with supporting one team, individuals, who are more likely to be men than women, also define themselves as general fans of a sport (28). The typical behavior of the general fan consists of watching games or reading news about tournaments, teams, and players. However, it lacks the emotional connectedness or devotion to this activity, and this is due to a low level of attachment, considering there is no unique spatial or communal bonding. As highlighted by (29), sports media continues to evolve, enabling fans to engage more actively in immersive participation, essentially enhancing their involvement in augmented spectatorship. However, it remains evident that at its core, spectatorship remains a shared and prevalent activity. In contrast (30), introduces a distinct perspective on sports fandom, one that encompasses the integration of sports into everyday life, extending beyond traditional spectatorship. In doing so, he establishes the groundwork for the exploration of sports fandom as an ever-evolving and perhaps even fluid way of life. Moreover, (31) presents an analysis of sports enthusiasts using sociologist

Anthony Giddens' structuration theory. His findings suggest that the everyday practices of fans, referred to as "practical consciousness" (p. 293), are acquired and continually adapt through their social interactions. Essentially, the process of acquiring knowledge and embracing fan-related behaviors becomes an integral part of fans' daily lives. As the current article also underscores, these aspects play a vital role in shaping their collective identity.

In this article, I argue most previous definitions and behaviors still fall in the category of the traditional sports fan. However, the growing popularity of online sports fan communities has given rise to a new type of imagined community. The current conceptual article employs trends from Israeli sports, but it does not describe a phenomenon exclusive to this particular setting. In the global world, the diffusion of ideas and trends is shared instantly and virally. The common factors of the Israeli communities are humor and demonstration of knowledge, which are also an inseparable part of social human nature and the core characteristics of sports fandom. While the provincial-cultural viewpoint in Israeli society encouraged components of mediocrity traits as a part of these communities, this may be replaced in other countries by other relevant cultural characteristics. The present article seeks to lay the theoretical foundation for forming communities based on common social and cultural interests in the context of sports. This is to define the phenomenon in which fans of specific teams unite and become fans of the sport itself. This allows sports fans to devote more time to other fandom aspects, which provides them with many benefits. The emerging "fan of the sport" demands less commitment in everyday life, and it allows the individual to practice his fandom on a flexible schedule, has no passionate rivalries, does not emphasize sports success, and is generally less stressful. In other words, it may shift fandom to a more casual phenomenon, further away from the profound emotional connection and time-consuming lifestyle that has long been a part of sports fans' traditional identity.

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# Sport, the arts, and fans' loyalty: the role of color for sport fans

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Sport fandom has attracted far-ranging research attention. Fans' commitment, loyalty, and sense of affinity are abundantly expressed in a long list of life practices. Precisely in this context, the color that identifies each sports team has also become an important element of the game but also a crucial component of fans' identities. The present article focuses on the esthetics of team uniform colors and identifies the artistic roles they fill. Among other things, the article addresses the important role of color, for example in identifying and distinguishing figures on the pitch from the background by creating clear borders between the elements on the pitch that compete for fans' attention; in the extension of fans' emotions through the connection between team and color; in creating the opportunity for spectators to participate fully in creating the esthetic experience on the field through the intensive use of team colors; and in enhancing a team's halo effect through the association of the team with its colors. On a deeper level, the article states that in an era of commercialized sports, the team color remains the clear and consistent symbol of the team that preserves the identity of the fans.

## KEYWORDS

sport, art, fans, esthetic, colors

## Theoretical background

### Esthetics and color

Esthetic experiences have a profound effect on our lives and affect decisions and behavior, far beyond what is generally called art (Brielmann and Pelli, 2018). Schweid (2004) contends that esthetic emotion is a tool in the service of evolution and that the esthetic experience contributes to man's well-being. Research has proved that esthetics affects our mental health, the healing process in patients (Ulrich, 2001; Evans, 2003), cognitive function in general (Wells, 2000), and even the performance of more prolonged sports activity such as walking (Ball et al., 2001).

Esthetic emotion has several origins, and while the sense of sight may be central, it is not the only source. An esthetic experience is obtained from the activation of several senses simultaneously—in the case of sports, by both the players and the spectators. Thus, the effects of contact and friction on the field and in the bleachers, the sense of smell in the stadiums (food, sweat, smoke), the sense of hearing which is considered to be of great importance at sports events, etc. can be objects of research. In the present study, we focus on the esthetic experience deriving from the sense of sight, due to its dramatic contribution to esthetic emotion in general and in sports in particular. Visual esthetics has indeed attracted extensive research attention, but, strangely enough, the role of color, considered an important esthetic component, has remains somewhat in the shadows (Nascimento et al., 2021).

The role of color in our lives is far greater and more important than might be thought. It is present in almost every aspect of our lives, affects our beliefs and feelings, and the decisions we make, and is even in our dreams (Elliot and Maier, 2014). Color is considered one of the most

important visual components in our lives and even the most powerful information channel of all human senses (Suk and Irtel, 2010). Vecera et al. (2004) stressed the ability of color to create distinctions between figures and their background and between static objects and objects in motion, and so helps to identify a person or an object in a space. This is of genuine importance in the dynamic and crowded sports space.

## Sport and society

Sport has become one of the most important and popular institutions in modern society. It enthalls billions of people worldwide and bridges over geographic, cultural, ethnic, and other differences (Kennedy and Hills, 2015). The popularity of sports is enormous, and its fans are exceptionally loyal and committed to the team and its players (Wann and James, 2018). It is no coincidence that many compare sports to religion, based on their many material and symbolic commonalities (Bain-Selbo and Sapp, 2016).

One of the main reasons for sports' unprecedented popularity and consequently the strong dedication of its fans, is the fact that for the fans, sport represents something far greater than the game itself. A sports team represents profound elements of fans' identities. As a result, most sport events are heavily charged with historic, political, social, economic, and other meanings, far beyond the game itself (Tamir, 2022). It is therefore no surprise that the audience's involvement and commitment is exceptional in comparison with other social and popular arenas.

As a result of this, we can see a particularly impressive commitment of sports fans to their teams, as expressed in constant sacrifice—financial, physical, emotional, and many other practices (Levental et al., 2021) that emphasize the deep connection between the fans and their team. The other side of the coin highlights the less beautiful sides of the sport (Galily et al., 2016), including the violence (Levental and Ben-Eli, 2022) that comes from exactly same places.

Sports in general and football in particular are full of emotionally charged moments (Ng and Kidder, 2010), which allow activists and spectators to discharge emotions (Elias and Dunning, 1986).

Elias and Dunning in the Quest for Excitement in Leisure (Elias and Dunning, 2008) pointed to the sport's distinctive essence. The sport, according to them, is based on a deliberate build-up of tensions over a period of time, designed to culminate in a climactic release, without which it would cease to be exciting or enjoyable. That is, the pleasure is derived from "controlled decontrolling of emotional controls." Accordingly, the sport provides its players and fans with a wide and extreme range of emotions and allows the expression of emotional outbursts not acceptable in other areas of daily life.

In addition, in the modern cultural age, sports events may represent almost single opportunity for fans' to challenge their identities and examine them against a competing identity. On the basis of this notion, the author George Orwell offered an accurate description of sports events as "war minus the shooting" (Orwell, 1945). It is therefore unsurprising that over the years, sports has adopted militaristic rhetoric (Tamir et al., 2017).

Moreover, it should be remembered that due to its competitive nature, sport is also a rare opportunity for people to challenge physical limitations and the forces of nature. The innate ambition of sports to break records drives sportsmen and women to run faster, to jump

higher, and to throw stronger. Therefore, watching a human body at its peak is in itself an impressive esthetic experience and is also considered one of the secrets of sports' magic and appeal (Mumford, 2013).

Like national symbols, sport teams, which as we have already said are perceived as extensions of identity (national and others), are identified with symbols and colors. Every sport team is identified with the color of their uniforms, which their fans also adopt in their attire and accessories. Team colors have long been a part of fans' identity, irrespective of a specific game (Tamir, 2021). Although colors have gained key status in the sporting arena, color has received scant attention in sports research. Research on the subject has studied the effects of color on sporting achievements or on referees' decision making (Hagemann et al., 2008; Krenn, 2014) but has rarely investigated color in an esthetic context. The present research focuses on the artistic and esthetic role of color on the sports fields, especially for sport fans, which has become of greatest importance in the sporting arena.

## Discussion—the esthetics of color in sport

Sports has a unique esthetic that derives from its internal logic (Mumford, 2019). The main purpose of sport is obviously the competition, but at the same time it creates an esthetic value.

The esthetic structure of sports is largely fixed—infrastructure, rules, and other basic principles. Even the players' position on the field is structured and constrained in many fields of sport, but the harmony between the players in team sports, the superhuman effort of sportsmen and women who pushing their physical limits, and obviously the spectators' presence in the stadiums, are all part of the esthetics of a sports event. The massive media presence at sports events makes the unique esthetic elements accessible and observable.

Precisely in this context, a team's colors play several important esthetic functions in sports: distinguishing a figure from the background and creating boundaries between the competitors, extending the duration of esthetic emotion, and creating an opportunity for the audience to participate fully in shaping the game's esthetic experience.

## Identifying figures and distinguishing them from the background

Competitive sports between individuals or teams, in a limited pre-defined space creates a dynamic and constantly changing environment. In the spirit of the ethos of modern sports—"faster, higher, stronger"—sports activities themselves are conducted at an extremely high intensity and pace. The ability to mark the competing objects on the field is of enormous importance for the experience of the game and watching it, and become an extremely challenging task in such an environment, certainly when considering the fact that more than 20 athletes are engaged on the field simultaneously in some fields of sport, in addition to referees, trainers, and players on the bench (substitutes). The size of the stadiums and the massive and active audience within them also make the task of identification difficult. Since some branches of

sport are played in the open air, and the weather conditions (e.g., mist, rain, wind), add to the complexity of the task by limiting one's vision and making it difficult to identify players on the field (Goldschmied et al., 2020). Color therefore plays an extremely important role in the identification process by creating the essential contrast between team members and their opponents.

Much sports takes place in open spaces (which are characterized by a large number of stimuli and concurrent dynamic developments) in which the players, the referees, and the spectators scour the area to identify threats and opportunities. Identifying players, in this case by the color of their uniforms, is therefore critical. The open area demands players and spectators to attend to multiple dimensions simultaneously, hence the great importance of color and its prominence—in helping to survey the situation on the field, in order to build up a current picture of the situation and make good decisions. In this context, too, color plays a dramatic role, since it allows for information to be processed by players and spectators, for the speed of the figures to be identified even without processing the finer details of each image. In a sports event, we are in fact completing the information with the help of the esthetics of color.

Colors are also helpful to the sportsmen and women themselves who are in constant motion, to the referees, and as previously stated, to the spectators. In esthetic terms, color plays a part in identifying figures and distinguishing them from the background, due to the creation of clear boundaries between the competing elements on the field. For this reason, for example, the goalkeepers of soccer teams wear a different color of shirt from the other players, so as to mark them as having unique status (they may handle the ball), similar to libero's role in volleyball, to whom different rules apply from the other team members. This is also true of the color of the ball in many branches of sport, allowing it to be identified at any given moment and to be distinguished from the other objects on the field and so too for the color of the referees' shirts. On the same grounds it is also possible to argue that the color of the surface on which the competition takes place, is of importance and plays a special role. Thus, for example, the green color of the grass on which many branches of sports are played, makes it a space that maintains the games' true origins as a spontaneous neighborhood game before the sport was disciplined through defined economic-professional codes.

The intensive entry of the media into sports events, given the enormous investment in purchasing broadcasting rights (Tamir and Lehman-Wilzig, 2023), has accelerated the need for clear distinctions between the forces operating on the field. Televised sports broadcasts give viewers high-quality and unique viewing angles, as a result of the many resources (multiple quality cameras, advanced technology, etc.) allocated to the event. In some branches of sports, games are filmed to input referees' decisions (that are sometimes made at an accuracy of centimeters) and so, for one reason or another, the image of what is happening on the field must be as clear and incontrovertible as possible.

The categorical distinction and identification afforded by the colors of the shirts nonetheless exacts a toll. Research has shown that color *per se* affects refereeing and assessments of the athletes in a variety of branches of sport, due to the fact that some colors attract more attention than others or are associated with certain cultural phenomena, such as aggressiveness (Hill and Barton, 2005; Attrill et al., 2008; Ilie et al., 2008).

## Extending the duration of esthetic emotions

The debate over “imagined communities,” which are associated with the cultivation and reinforcement of national sentiments (Anderson, 2006) was warmly adopted by sports researchers who sought to describe the solidarity and comradeship of sport fans around their team (Kalman-Lamb, 2021). Both in the national context and the sports context, a member of the community needs clear systems of symbols to help him feel attachment to the community and connect with its values. In fact, colors become the symbol that is most strongly identified with a sports team.

The initiation of young fans, largely by the father of the family (Tamir, 2022) includes the adoption and acquisition of the esthetic emotion. To bring their children into the circle of the team's supporters, parents use various methods, which include emphasis on identification with the team's color, and no less important, antagonism to the opposing team's color. This is generally expressed in attire, bedroom decorations, and accessories. Consequently, purchase of the club's shirts, scarves, and other branded merchandise (Derbaix and Decrop, 2011) plays an important part in the inculcation of the esthetic emotion in each new generation of fans.

The commodification of sports allows fans to purchase club-related merchandise—and perhaps even exploited their fierce attachment to the club—to reinforce their identification as fans and their attachment to the club and to the community (Vamplew, 2018). To a great extent, the team's color can be seen as adorning all the merchandise, as a kind of extension of the fandom and the emotion that accompanies it. Since a team's games are played approximately once a week and are seasonal in nature with long breaks, a team's colors also allow fans to extend the duration the esthetic emotion they associate with their teams well beyond the actual game.

It is important to stress that the extension of fandom through color is used both internally (the fan and his/her feeling toward the team) and externally (the community and its relationship to the fan). In effect, this notion is consistent with the “halo effect” (Kahneman, 2011). The argument is that one's initial general impression or the impression of a salient feature biases one's thinking and influences the way in which we judge other qualities. We are inclined to apply the qualities and feelings we have for a product, or in our case a team, to other elements related to the team's fans. In the sporting context, Hickman and Lawrence (2010) showed that fans are inclined to give higher ratings to issues related to their favorite team and give lower ratings to those associated with their team's rivals. In the same vein, it could be argued that a prominent color on and off the field enfolds the full set of qualities that fans associate with the team and its community of fans. This implies that I will begin to attribute positive qualities to a player, just because he is wearing “my team's” shirt, even if I did not like him a short time ago when he played for the opposing team. This is also the case with regard to fans. When a person whom I do not know at all walks along the street with a shirt in my team's colors. I will probably associate him with the attributes and feelings I have toward the team itself. Colors endow fans with social status and affirms their membership in the community.

It should be emphasized that this argument is based on the notion that one's esthetic emotion develops over time, meaning that esthetic taste is acquired over a lifetime. Bourdieu (1978) argues that the favoring of different types of sports are derived from the luxury of

having spare time, public image and norms. He refers to such elements as “ethical or esthetic accomplishment which are or seem to be contained in each sport.”

Since sports fandom is, to a large degree, “inherited,” early family experiences probably affect young family members’ appreciation of specific colors, and the emotions associate with them.

## Communities as active partners in creating esthetic emotion in sports

Spectators are considered an important element of the game, to the extent that they are occasionally termed “the 12th player” (in addition to the 11 players in every soccer team). Researchers have found that spectators (or their absence) have a genuine impact on what happens on the field. Thus, for example, spectators were found to have a direct, psychological, and physiological effect on the players—who, for example, experience hormonal changes (in the level of testosterone) in the games, depending on the pressure exerted by the audience (Carré et al., 2006; Fothergill et al., 2017); on referees and their decisions in the game (Anderson et al., 2012). Studies also found that during the Covid-19 pandemic, games that were played without an audience typically involved fewer emotional situations, and differences could be observed in the number of fouls and goalmouth poaching (Leitner and Richlan, 2021).

The affinity between spectators and the team, as previously stated, is important at almost any time and place, but the games in the stadiums are an important intersection of a team, its fans, and the fans of the rival team. It is therefore a good opportunity for fans of both teams to prominently externalize their feelings for their team, for better or worse, in chants and expressions of protest, which are also directed at the rival team (Schoonderwoerd, 2011; Tamir, 2020). In any event, audiences become full partners in the creation of the esthetic experience on the field, through the intensive use of the team’s colors—from attire, through banners and flags, to entire pyrotechnical routines. Color gives audiences an opportunity to become full partners in the creation of the esthetic experience on the field.

In other word, color is used on the field to create an esthetic of beauty by the audience who are wearing shirts and scarves in the team’s colors. Many spectators also use the bleachers for impressive and extremely creative displays of esthetic enjoyment.

## Conclusion

Color plays a central role in our lives, on conscious and unconscious levels. It affects the way we see reality and make judgments and decisions. In the world of sports, color is essential, yet its importance extends far beyond the symbolic. Color serves as a key

symbol in the identification of groups. The basic and central objective of color is to differentiate between the competitors on the field, but it also fills esthetic roles, as presented in this article. Thus, for example, color allows the creation of clear boundaries between the players and clearly marks out figures and tasks on the field. Moreover, color is also what makes the audience on the field a partner in creating a game’s esthetic experience.

Televised sports broadcasts have enhanced the role of color and even elevated its use. Fans worldwide have begun to display their affection for the club with products in the club’s colors and to echo this in their social media. In other words, color has become an esthetic agent of the highest order in the world of sports.

In practice, modern sports teams can be likened to the Ship of Theseus allegory. The philosophical question at the heart of the story is whether a ship with all its parts replaced remains the same ship? By the same token, in an era of commercialized sports, players and coaches move from team to team so frequently, and the essence of the team is seemingly emptied of its content. And in this situation, the identity of the team is actually derived from the tradition and especially from its symbols. The color, which became the most distinct and recognizable symbol of the sports teams, therefore became a torch that carries with it a significant value charge and a complete heritage of identity.

## Author contributions

This work is an equal shared effort paper. RS has contributed the art perspective and IT the sports perspective. The combined work produced a novel and unusual combination between two subjects that normally are not associated together. All authors contributed to the article and approved the submitted version.

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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# Do Chinese viewers watch e-sports games for a different reason? Motivations, attitude, and team identification in predicting e-sports online spectatorship

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**Introduction:** Understanding factors that predict the intention of e-sports game online spectatorship has drawn a great deal of scholarly attention. Prior work on this topic has primarily focused on explaining the mediation mechanism between the spectator motivations and behavioral intention, such as attitude and subjective well-being, while overlooking the specific role of team identification and satisfaction with past experience, which were understudied in the previous studies but also prominent in the context of e-sports spectatorship. Besides, previous research was mainly conducted in a Western context; therefore, little was known about the online e-sports audience in China and their motivations to view e-sports games on live-streaming platforms.

**Methods:** The current study thus aims to examine if and how these factors are related to the intention of watching e-sports games online by hierarchical regression and structural equation modeling.

**Results:** Results from a survey of 452 Chinese e-sports online audiences suggested that three motivations (skill improvement, entertainment, and friends bonding), attitude towards e-sports game online spectatorship, and satisfaction with past experience were positively related to watching intention. These motivations and satisfaction also positively influenced attitude, while socialization opportunity (one of the motivations) negatively influenced attitude. Furthermore, team identification negatively moderated the relationship between satisfaction with past experience and behavioral intention. Also, attitude mediated the association between motivations, satisfaction, and behavioral intention.

**Discussion:** In general, our study identifies the motivations that relate to Chinese e-sports viewers' attitude as well as their watching intention, and underscores the role of satisfaction with past experience, attitude, and team identification in the context of e-sports. These findings contribute to deriving a holistic view of e-sports game online spectatorship.

## KEYWORDS

e-sports games, spectatorship motivation, the theory of reasoned action, team identification, satisfaction with past experience

## Introduction

Electronic sport (e-sport) is a video game-based competition between individual players or between teams, attracting millions of spectators to the host cities in person or online through live-streaming services (Kim and Kim, 2020). According to Newzoo (2022), e-sports would

generate nearly \$1.38 billion in revenues globally by the end of 2022, and China accounted for almost a third of worldwide esports revenues. However, in the last 3 years, along with the outbreak and recurrence of the COVID-19 pandemic, most e-sports game spectatorship gradually shifted from offline to online through live-streaming services, underscoring the importance of studying the formation of watching intention. After all, the key to the sustainable and healthy development of e-sports is to successfully attract and retain viewers, in which the watching intention is an important indicator to assess whether e-sports can attract and retain their viewers (Wang et al., 2021).

Within the existing literature of e-sports, the research on e-sports should be integrated with specific social environment and calls for more attention to the culture of e-sports environment experienced by e-sports fans. However, a majority of studies have focused on the e-sports industry in a Western context, while limited research exists explicitly on the e-sports industry in China, and even less specifically on Chinese e-sports fan's watching behavior and watching intention. Notably, social acceptance levels of e-sports differ significantly across different cultures and it would influence the perceptions and attitudes of people towards e-sports engagement. For example, Cranmer et al. (2021) believed that the e-sports industry is better established in Asian markets than in Europe and the Americas. E-sports is an accepted and well-represented activity with a large follower base in South Korea. In their view, western cultures are often more associated with individualism, whereas cultures in South Korea tend to be collectively organized (Cranmer et al., 2021), which might explain the gap between Korea and the West in the social acceptance of e-sports. However, in China, where the culture also features collectivism, video games are metaphorized as "electronic heroin" (He and Cao, 2018). This trend did not show a decline until the last 20 years (He and Cao, 2018). Wong et al. (2021) investigated the perceptions and attitudes of teenagers and young adults toward e-sports engagement, revealing that e-sports was continually plagued by a poor social image in Hong Kong and, therefore, most parents disapproved of their children participating in e-sports.

Furthermore, several studies on e-sports engagement show limited understanding of Chinese e-sports fans' watching intentions. For example, Wang et al. (2021) used a technology acceptance model to verify the influence of motivations on watching intention, such as social interaction, entertainment, and knowledge acquisition. However, this study ignored a key predictor variable of behavioral intention – attitude (Yan, 2014), as well as other relevant factors that matter in e-sports context, such as team identification and satisfaction with past experience. Similarly, a study conducted by Zhao et al. (2022) in China's Henan Province confirmed the significant positive impact of perceived usefulness and perceived ease of use on the attitude toward e-sports, while overlooking the explaining power of motivation on attitude and behavioral intention.

As we design the research to more carefully investigate Chinese audiences' e-sports watching intention, literature review found that empirical studies examining e-sports spectatorship so far still lacks consistent conclusions (Rietz and Hallmann, 2022). Some researchers seek to directly test the relationship between spectatorship motivations and watching intention. For example, a study conducted by Macey et al. (2022) found that knowledge acquisition, interaction with family and friends, and escapist motivation were positively associated with e-sports watching intention. However, Sjöblom et al. (2020) concluded that only vicarious achievement and novelty would positively predict future online consumption of e-sports. Given the mixed findings in the literature, we propose a research question as follows:

*RQ1: In China, which motivation could influence the intention to watch e-sports games online directly?*

Moreover, researchers explored the specific mediating mechanism between the spectatorship motivations and watching intention by testing different mediators. Different choices of mediating variables imply that scholars do not reach a consensus on how to understand the mechanism through which spectatorship motivations are associated with watching intention. Some of the mediator variables that have been tested include attitude (Xiao, 2020), flow experience, and subjective well-being (Kim and Kim, 2020). Although Xiao (2020) tried to explore the role of attitude to explain the relationship between spectatorship motivation and watching intention, he did not measure the indirect effect of spectatorship motivation on watching intention via attitude. Therefore, we propose a research question as follows:

*RQ2: In the context of e-sports game online spectatorship, whether attitude can be confirmed as a mediator between motivation and watching intention? If any, how large is the indirect effect of spectatorship motivation on watching intention via attitude?*

Besides, previous studies in traditional sports spectatorship have shown that factors, such as past watching experience and fans' team identification, also significantly affect their attendance intention (Kaplanidou and Gibson, 2010; Lee et al., 2020).

The world of traditional sports constructs an experience in which a culture is formed where loyal fans are able to show support for their team through their words and actions (Brown et al., 2018). In this vein, the degree of a fan's psychological connection with a team was operationalized by Wann (1994) as team identification, which has been a widely used concept in the context of spectator sports. Sporting events provide an exemplary platform to study team identification, as a collective identity that spectators develop with a team. As identity activation leads to behavioral involvement to engagement of action to express the collective identity (Ashmore et al., 2004), fans continue to attend sports games (Lee et al., 2020). In e-sports, the influence of professional teams on players and spectators is similar in many ways. However, little is known about the role of e-sports fans' team identification on the formation of their watching intention. Moreover, past behavior has also been identified as a significant predictor of future behavior. Specifically, the significant effect of past behavior on future behavioral intentions has been corroborated in many fields, such as physical activity (Wang and Zhang, 2016), travel (Huang and Hsu, 2009), hockey games (Cunningham and Kwon, 2003) and the Senior Games (Kaplanidou and Gibson, 2010), while little is known about its role in the context of e-sports online spectatorship. Given these, we propose a research question as follows:

*RQ3: In the context of e-sports game online spectatorship, how are past behavior and team identification associated with watching intention?*

In summary, this study firstly seeks to validate the relationship between a set of e-sports spectatorship motivations and future watching intention in the context of Chinese e-sports environment. Moreover, while the direct link between motivation and intention seems plausible, it is also important to explore mechanisms that explain these relationships. Therefore, attitude would be served as a

mediator to explain this relationship, as it is often regarded as a key predictor variable of behavioral intention. In addition to these well-studied factors in e-sports literature, this study would also explicate the role of past behavior and team identification in the formation of watching intention.

## Literature review

### The theory of reasoned action and the intention to watch e-sports games online

The theory of reasoned action (TRA, Fishbein and Ajzen, 1975) has been widely used as a model for the prediction of behavioral intentions and behavior in technology adoption. Considering TRA model's long development history is often related to several other popular theoretical models, we will first briefly review them and discuss our choice of TRA model.

As e-sports online engagement requires esports consumers to continuously adopt and use new technology, including both hardware (i.e., smartphones and computers) and software (i.e., live-streaming software), a plethora of e-sports studies have applied the technology adoption theories (i.e., Technology Acceptance Model and Unified Theory of Acceptance and Use of Technology) as the theoretical framework to examine the antecedents and consequence associated with esports engagement (Jang and Byon, 2019; Jang et al., 2021; Meng-Lewis et al., 2022). For example, Meng-Lewis et al. (2022) integrated the Expectation Confirmation Model (ECM) with the Unified Theory of Acceptance and Use of Technology (UTAUT) to identify the determining factors predicting users' intention to watch e-sports games on the live-streaming platform. To emphasize the hedonic value (intrinsic motivation) of technology users, Venkatesh et al. (2012) proposed UTAUT2, which incorporates three additional constructs into UTAUT: hedonic motivation, price value, and habit. UTAUT2 application studies involved users' engagement in plethora of technologies such as gaming on mobile devices (Ramírez-Correa et al., 2019), social network sites (Herrero et al., 2017) and mobile tv (Wong et al., 2014). Majority of the UTAUT2 application studies examined user adoption decisions since they examined new to the market technologies in nascent stages of their product life cycle (Tamilmani et al., 2021). Similarly, Xu et al. (2023) used the technology acceptance model (TAM) to investigate how sports customers adopted over-the-top (OTT) services to consume sport content online. The TAM (Davis, 1989) is actually an adaptation of the theory of reasoned action (TRA) proposed by Fishbein and Ajzen (1975) to explain and predict the behaviors of people in a specific situation (Legris et al., 2003).

While TAM is widely recognized for its application in studying the adoption of online and mobile technologies, we have chosen to utilize the TRA as the theoretical framework for our study, motivated by two distinct reasons. On one hand, watching e-sports games through the live-streaming service may not be accepted as a process of embracing new technology in China. The first esports live streaming platform in China, Douyu TV, began operating in 2014 (Meng-Lewis et al., 2022), which means esports online spectatorship may not be perceived as novel by Chinese e-sports fans, but rather an integral component of their daily lives. Furthermore, Buabeng-Andoh (2018) indicated that TAM is less general than TRA to determine technology usage behavior.

Therefore, our study would take the TRA as the theoretical framework to explore the antecedents associated with esports engagement.

The TRA theory posits that behavioral intentions are the immediate antecedents to the behavior (Madden et al., 1992), while one's attitude toward certain behaviors and one's perceived social pressure (i.e., subjective norms) are two of the main factors that directly correlate with one's intention to perform an action (Ajzen and Fishbein, 1977, 1980; Xiao, 2020). The attitude toward the behavior refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question, and the subjective norm refers to the perceived social pressure to perform or not to perform the behavior (Ajzen, 1991). In the context of this study, we seek to define e-sports audience's attitude towards e-sports game online spectatorship through the degree to which they have a favorable or unfavorable evaluation on their e-sports game online spectatorship. In the similar vein, subjective norms are defined as their perceived social pressure to watch e-sports games online.

Generally, the more favorable the attitude and subjective norm with respect to a behavior, the stronger should be an individual's intention to perform the behavior under consideration (Ajzen, 1991). Over the past few decades, the predictive power of intention of actual behavior has been corroborated in many fields. Therefore, in the context of e-sports game online spectatorship, it seems plausible that those with strong watching intentions are more likely to view the e-sports tournaments through live-streaming services. In this vein, given the pivotal role of behavioral intention in the theory of reasoned action framework and its predictive power of actual behavior (Xiao, 2020), this study aims to explore the factors leading to behavioral intention.

In studies outside the domain of e-sports, Jeong et al. (2021) examined the process behind the decision of sports fans to attend sports matches at stadiums amid the pandemic. Their findings suggested that attitude and subjective norms would influence their attendance intention positively. A study conducted by Leung and Chen (2017) also showed that attitude and subjective norms could significantly influence consumers' intentions to adopt mobile TV services.

Given the commonalities between watching mobile TV and watching e-sports games on an electronic device, we hypothesize that:

*H1: Viewers' attitude towards e-sports game online spectatorship is positively related to their future watching intention.*

*H2: Viewers' subjective norms are positively related to future watching intention.*

Tarkiainen and Sundqvist (2005) explored the relationships between subjective norms, attitudes, and intention to buy organic food by applying structural equation modeling. Not only did their results consolidate the predictive power of attitude in the consumers' intention, but also confirmed the positive influence of subjective norms on the formation of attitude. Hence, the following hypothesis is posited.

*H3: Viewers' subjective norms are positively related to their attitude towards e-sports games online spectatorship.*

## E-sports spectatorship motivations

Motivation is one of the most heavily studied constructs in sport-related research (Snelgrove et al., 2008). Due to the emergence of live-streaming platforms and e-sports games, an increasing number of studies have begun to call for work in the e-sports spectatorship motivations. Previous studies have primarily applied the uses and gratifications theory (UGT) to develop the motivation scale and examine the users' motivations for selecting and consuming media in the context of traditional sports or e-sports (Trail and James, 2001; Hamari and Sjöblom, 2017; Sjöblom et al., 2017; Sjöblom and Hamari, 2017; Brown et al., 2018; Cabeza-Ramírez et al., 2020; Wulf et al., 2020). For example, Trail and James (2001) developed the Motivation Scale for Sport Consumption (MSSC) to measure the motivations behind sport spectator consumption behavior. The MSSC relies on a similar theoretical understanding as the UGT, in that it focuses on the gratification and experiences that sports consumption affords for spectators (Hamari and Sjöblom, 2017). The MSSC and UGT share many mutual aspects, such as an escapism from everyday life, acquiring information from the media content, being a fan, social interaction and so forth (Hamari and Sjöblom, 2017). In terms of the construct validity and reliability, the MSSC demonstrated the good psychometric properties (Trail and James, 2001), as illustrated in Tables 1, 2.

As one of the most widely applied scales for sports consumption, the MSSC has gone through rounds of revisions and has resulted in current variations, which commonly consist of 10 constructs, including vicarious achievement, aesthetics of sport, drama of sport, watching sports as a means to escape everyday life, knowledge acquisition related to the sport, admiring the skills of the athlete's, social interaction with other spectators, physical attractiveness of the athletes, novelty of new players and teams, and the enjoyment of aggression and the aggressive behaviors the athletes exhibit (Trail and James, 2001; Hamari and Sjöblom, 2017). In a study that is more aligned with the goal of our current study, Xiao (2020) selected six motivators from the MSSC as behavioral beliefs to examine their correlation with the intention to watch e-sports. Also, Kim and Kim, (2020) applied the MSSC (Trail and James, 2001) in their e-sports spectatorship studies.

TABLE 1 The Cronbach's alpha and AVE of the MSSC (Trail and James, 2001).

Factor	$\alpha$	AVE
Achievement	0.89	0.74
Knowledge	0.80	0.59
Aesthetics	0.88	0.72
Drama	0.80	0.58
Escape	0.72	0.51
Family	0.68	0.48
Physical attraction	0.78	0.69
Physical skill	0.75	0.53
Social interaction	0.78	0.54

$\alpha$ , Cronbach's alpha; AVE, Average variance extracted. The data was collected from 203 season ticket holders. All of the subscale AVE values exceeded 0.50, indicating that convergent validity was good.

With the Internet has been a significant tool for sports consumption, professional sport teams' Web sites became an important component of people's sports consumption. Yet, little was know about the Internet users' consumption motives for sport teams' Web sites, as the established motivation scales (e.g., the MSSC) focused more on the traditional media. To this end, Seo and Green (2008) developed the Motivation Scale for Sport Online Consumption (MSSOC) to measure dimensions of motivation for traditional sport Internet users. Based on this study, Brown et al. (2018) applied the motivations from the MSSOC to compare the uses sought and gratifications obtained when consuming media related to e-sports and traditional sports.

Nevertheless, not every scholar agrees that traditional sports consumption motivations are the same as e-sports spectatorship motivations. To this end, Qian et al. (2020b) developed the Motivation Scale of Esports Spectatorship (MSES) by considering the innate links that connect esports with video gaming and traditional sport. The composite reliability (CR) and average variance extracted (AVE) values of the MSES are shown in Table 3, to validate the factor reliability, convergent validity, and discriminant validity of it. Although Qian et al. (2020b) did not mention the Cronbach's alpha and correlation coefficient of the factors in the MSES in their study, they pointed out that its convergent validity and discriminant validity indices were all greater than the threshold values.

Although the MSSC was treated as an adequate measure for esports spectating by Macey et al. (2022), they also highlighted that additional aspects specific to esports require further investigation. Consequently, esports online spectator motivation should be considered a hybrid of traditional sports spectatorship motivations and new media consumption motivations (Seo and Jung, 2016). In this case, our study attempts to combine the motivation research on e-sports and traditional sports. Grounded in previous studies, the motivations can be divided into three categories: (a) streamer-oriented attributes (b) technology-oriented attributes (c) individual motivations. Please see Appendix 1 for the dimensions and references of three motivation categories.

Streamer-oriented attributes refer to the personality traits and characteristics of streamers perceived by the audience, such as perceived social attractiveness (Kim H.-M. et al., 2023), perceived similarity (Kim H.-M. et al., 2023) and streamer skills (Kim and Kim, 2023). Technology-oriented attributes refer to the attributes of live-streaming platforms, live-streaming apps and over-the-top (OTT) services, such as ease of use (Wang et al., 2021), viewing quality (Xu et al., 2023) and stream quality (Qian et al., 2020a). Although these external elements do have a huge impact on e-sports viewing, this study aims to focus on the individual motivations for two reasons. Firstly, individual motivations are the intrapersonal or interpersonal elements (hedonic or internal) that influence people's decision to consume e-sports (Qian et al., 2020a). Since this study aims to study the e-sports spectatorship from the perspective of Chinese e-sports fans, individual motivations are more in aligned with the goal of this study. Tang et al.'s (2022) study also indicated that esports spectatorship was driven significantly more by individual factors. In terms of the technology-oriented factors, the apps of different live-streaming platforms in China have almost the same features and functions, showing a trend of homogeneity. Essentially, these platforms are all easy to use and full of enjoyment. In addition to the technology factors, streamer-oriented factors are not as important as they are in

TABLE 2 The correlations among factors in the MSSC (Trail and James, 2001).

	Ach	Kno	Aes	Dra	Esc	Fam	Att	Ski	Soc
Ach	1								
Kno	0.185	1							
Aes	0.339	0.463	1						
Dra	0.309	0.249	0.311	1					
Esc	0.656	0.023	0.329	0.319	1				
Fam	0.355	0.075	0.353	0.338	0.406	1			
Att	0.194	−0.014	0.147	−0.115	0.164	0.062	1		
Ski	0.465	0.257	0.622	0.411	0.455	0.630	0.160	1	
Soc	0.451	0.334	0.376	0.388	0.479	0.312	0.083	0.519	1

Ach, Achievement; Kno, Knowledge; Aes, Aesthetics; Dra, Drama; Esc, Escape; Fam, Family; Att, Physical attraction; Ski, Physical skill; Soc, Social interaction. None of the squared correlations exceeded the AVE values for any of the constructs, indicating that discriminant validity was good.

TABLE 3 The CR and AVE of the MSES (Qian et al., 2020b).

Construct	CR	AVE
Competitive nature	0.88	0.58
Socialization opportunity	0.95	0.78
Skill improvement	0.93	0.68
Friends bonding	0.93	0.72
Game knowledge	0.87	0.63
Skill appreciation	0.82	0.53
Entertaining nature	0.90	0.64
Dramatic nature	0.83	0.62
Competition excitement	0.95	0.83
Vicarious sensation	0.77	0.54

CR, Composite reliability; AVE, Average variance extracted. The data was collected from 638 e-sports fans.

the context of live game streaming, since there is no fixed streamer in the official e-sports event live-streaming room at all. Therefore, we believe that the differences in the individual motivations would be more influential than streamer-oriented attributes and technology-oriented attributes in this study.

In this case, we integrated the MSSC (Trail and James, 2001; Trail et al., 2003) with the MSES (Qian et al., 2020b) to achieve a new list of individual e-sports spectatorship motivations. In accordance with the goal of this study, we aim to incorporate a set of internal and intangible factors that motivate individuals to seek specific experiences in sports or esports spectatorship through the lens of their socio-psychological needs. Therefore, we selected seven individual motivations from the list, consistent with the context of online spectatorship. The seven motivations include: (1) skill improvement, (2) vicarious achievement, (3) knowledge acquisition, (4) escapism, (5) entertaining nature, (6) socialization opportunity, and (7) friends bonding, as Table 4 shows.

Since motivations are at the core of e-sports spectatorship studies, a large body of research has directly related motivations with actual purposeful behaviors of watching e-sports. For example, Hamari and Sjöblom (2017) found that escapism, acquiring knowledge about the games being played positively predicted e-sport spectating frequency, and similarly, acquisition of knowledge, escapism, and friends were found to be positively associated with watching intention in another research (Macey et al., 2022). Brown et al. (2018) focused on

comparing the motives when consuming media related to e-sports and traditional sports from a use sought and gratification perspective. Their results revealed that eSports participants sought out media for social sport, fandom, and Schwabism (a feeling of having superior knowledge) (Brown et al., 2018). In terms of a real-time strategy game, StarCraft II, motivations including vicarious achievement, skill of the athletes, and entertainment value were found to impact the game attendance frequency positively (Pizzo et al., 2018). Skill of the athletes might also attract viewers to watch e-sports games. As Qian et al. (2020b) confirmed before, skill improvement was the unique motive that emerged in the esports context. Given these existing studies and the predictive power of behavioral intention in actual behavior, we hypothesize that:

*H4: Viewers' e-sports game online spectatorship motivation is positively related to their future watching intention.*

In Xiao's research (2020), motivators seemed to reflect an individual's behavioral outcome expectancies, and he applied the expectancy-value model to explain how motivators influence attitude formation. Their results uncovered a positive relationship between motivation (aesthetics, drama, and escapism) and attitude (Xiao, 2020). Likewise, a great deal of literature starts with the use and gratification theory (Katz et al., 1973), proving that in the context of e-sports spectatorship, those with different motives tend to meet their expectancies by watching e-sports online and subsequently fulfill both psychological and social needs (Hamari and Sjöblom, 2017; Pizzo et al., 2018; Kim and Kim, 2020). Thus, we assume that fans may develop a positive attitude toward watching e-sports games online if the behavior could meet their expectancies. A hypothesis is posited as follows:

*H5: Viewers' e-sports game online spectatorship motivation is positively related to their attitude towards e-sports game online spectatorship.*

## Past behavior and satisfaction with past experience

Past behavior is typically the strongest predictor of future behavior (Ajzen, 1991; Wang and Zhang, 2016). Moreover, the significant effect of past behavior on future behavioral intentions has

TABLE 4 Motivations for e-sports game online spectatorship.

Motivation	Definition
Skill improvement	The extent to which esports fans watching e-sports is to learn new skills, improve their own games, and imitate professionals (Qian et al., 2020b).
Vicarious achievement	The extent to which esports fans watching e-sports is to empathize and co-live with people and characters in media content, and in the sports context, with the achievements of teams and players (Hamari and Sjöblom, 2017).
Knowledge acquisition	The extent to which esports fans watching e-sports is to acquire an increase in knowledge about the game (Kim and Kim, 2020).
Escapism	The extent to which esports fans watching e-sports is to escape from day-to-day routines, and spectatorship provides a distraction from everyday activities (Hamari and Sjöblom, 2017).
Entertaining nature	The extent to which esports fans watching e-sports is to seek happiness and pleasure (Qian et al., 2020b).
Socialization opportunity	The extent to which esports fans watching e-sports is to interact with people online with similar interests and familiar identities, and obtain a feeling of belongingness, camaraderie, and social acceptance (Qian et al., 2020b).
Friends bonding	The extent to which esports fans bond with friends in reality to develop and maintain social relationship via watching esports (Qian et al., 2020b).

also been corroborated in many fields, such as physical activity (Wang and Zhang, 2016), travel (Huang and Hsu, 2009), hockey games (Cunningham and Kwon, 2003) and so on, while little is known about its role in the context of e-sports online spectatorship. When it comes to the measurement of past behavior, most researchers adopted a single item, such as “Including last season, how many \_\_\_\_\_ men’s hockey games have you attended (Cunningham and Kwon, 2003)?” This single-item measure is applicable in the context of travel and traditional sports spectatorship. However, it is not so appropriate for the context of e-sports game online spectatorship in this study. On one hand, e-sports is a broad notion that includes so many different types of games, and undoubtedly, there should be a big difference between these games. On the other hand, watching e-sports games online is quite different from offline spectatorship. The most obvious difference lies in that when watching e-sports games online, viewers are more likely to be influenced by other entertainment ways on their electronic devices. For example, Macey et al. (2022) found that e-sports spectating would positively influence gaming intention. That is to say, online viewers are likely to play games, use social media, or do other irrelevant things after watching a game for a while, which offers an inaccurate measurement in this construct.

Despite the operationalization of past experience being blurred and arguable, Huang and Hsu (2009) developed a new approach to solving the problem, with the measurement of overall satisfaction with past experience. In their studies, overall satisfaction refers to a subjective evaluation of all past travel experiences in the destination, and the results indicated that people are more likely to revisit a destination if they have had satisfactory past travel experiences with it (Huang and Hsu, 2009). Therefore, we decided to adopt the measurement of satisfaction with past experience to explain one’s past behavior (Huang and Hsu, 2009), instead of the previously used single item (Cunningham and Kwon, 2003; Kaplanidou and Gibson, 2010). To better align with the goal of this study, satisfaction with past experience was defined as one’s subjective evaluation of his past experiences in e-sports game online spectatorship. Given this, we hypothesize:

H6: Satisfaction with past watching experience is positively related to attitude.

H7: Satisfaction with past watching experience is positively related to future watching intention.

## Attitude as a mediator

In the TRA framework, attitude is determined by behavioral beliefs (Fishbein and Ajzen, 1975). Behavioral beliefs are one’s outcome expectancy of a behavior (Ajzen and Driver, 1991). Xiao (2020) believed that this expectancy-value logic proposed by Fishbein and Ajzen (1975) for TRA is akin to the need-gratification rationality proposed in U&G theory (Blumler, 1979) to explain media consumption behaviors and attitudes. Thus, in this study, spectatorship motivations can be seen as the equivalent to the behavioral outcome expectation, just as behavioral beliefs function in the TRA framework (Xiao, 2020). Lin (2014) applied the cognitive–affective–conative framework (CAC) (Fishbein and Ajzen, 1975) to explain the mediating role of attitude in the relationship between the beliefs and behavioral intention. He believed that the central theme in the TRA is that intention or willingness to perform a behavior (i.e., conative) is influenced by one’s attitude towards the behavior (i.e., affection). And a positive attitude towards the behavior is shaped by one’s beliefs and evaluations about performing the behavior (cognitive) (Lin, 2014). In the same vein, he found that attitude mediates the path between the effects of all gratifications (pastime, entertainment, relaxation, escape, and surveillance motives for local news) and intention to read citizen journalism news. In the context of sports, Kaplanidou and Gibson (2010) also revealed that there were mediation effects of attitudes between satisfaction and intentions to participate in the event again among the elderly. Given these, the following hypotheses on the mediating effects of attitudes are proposed:

H8a: Attitude mediates the relationship between e-sports game online spectatorship motivation and future watching intention.

H8b: Attitude mediates the relationship between satisfaction with past watching experience and future watching intention.

## The role of team identification

Team identification reflects the intensity of a spectator’s association, a collective identity, with his or her team (Tajfel, 1982; Lee et al., 2017). Within the sports context, identification significantly influences recurring behavior, such as watching games on TV and participating in second-screen conversations about their team

(Cunningham and Eastin, 2017). Research conducted by Wann and Pierce (2003) indicated that a fan's attachment to a team is an important predictor of numerous affective, cognitive, and behavioral reactions. Specifically, those with higher team identification are more likely to attend future games (Wann et al., 2001; Matsuoka et al., 2003). Furthermore, Lee et al. (2020) investigated the complexity of how spectators' multiple identities influence their behavioral intention and posited that team identity directly affects their attendance intention. Notably, e-sports fans do not support every team. Instead, they are supporters of their favorite team during the spectatorship, and thus e-sports viewers are likely to own strong team identification and loyalty to specific teams. Given this, a hypothesis is proposed:

*H9: Team identification is positively related to future watching intention.*

Within the existing literature on traditional sports, researchers always classified sports fans into different groups based on the level of team identification in order to compare differences in their behaviors and feelings. For example, Bristow and Sebastian (2001) found significant differences between two fan groups in behavior and attitude to the Chicago Cubs baseball team, depending on the commitment of them. Wann et al. (1994) were able to show that highly identifying sport spectators reported an increase in positive emotions after watching a win, whereas low identifying viewers showed almost no emotional change. Schramm and Knoll (2017) used social identity theory to explain these differences that highly identifying sports fans view their team as being part of their social identity and therefore take a defeat of their team as a personal defeat

and a win of their team as a personal victory resulting in respective mood. Furthermore, Matsuoka et al. (2003) assessed the interaction effects of team identification and satisfaction with facets of a game on intentions to attend future games, finding that the intentions of highly identified fans relative to low identified fans were less influenced by satisfaction. Given that e-sports fans also have varying levels of identification with different teams, similar to traditional sports fans, we hypothesize a moderation model.

*H10: Team identification moderates the relationship between attitude and future watching intention.*

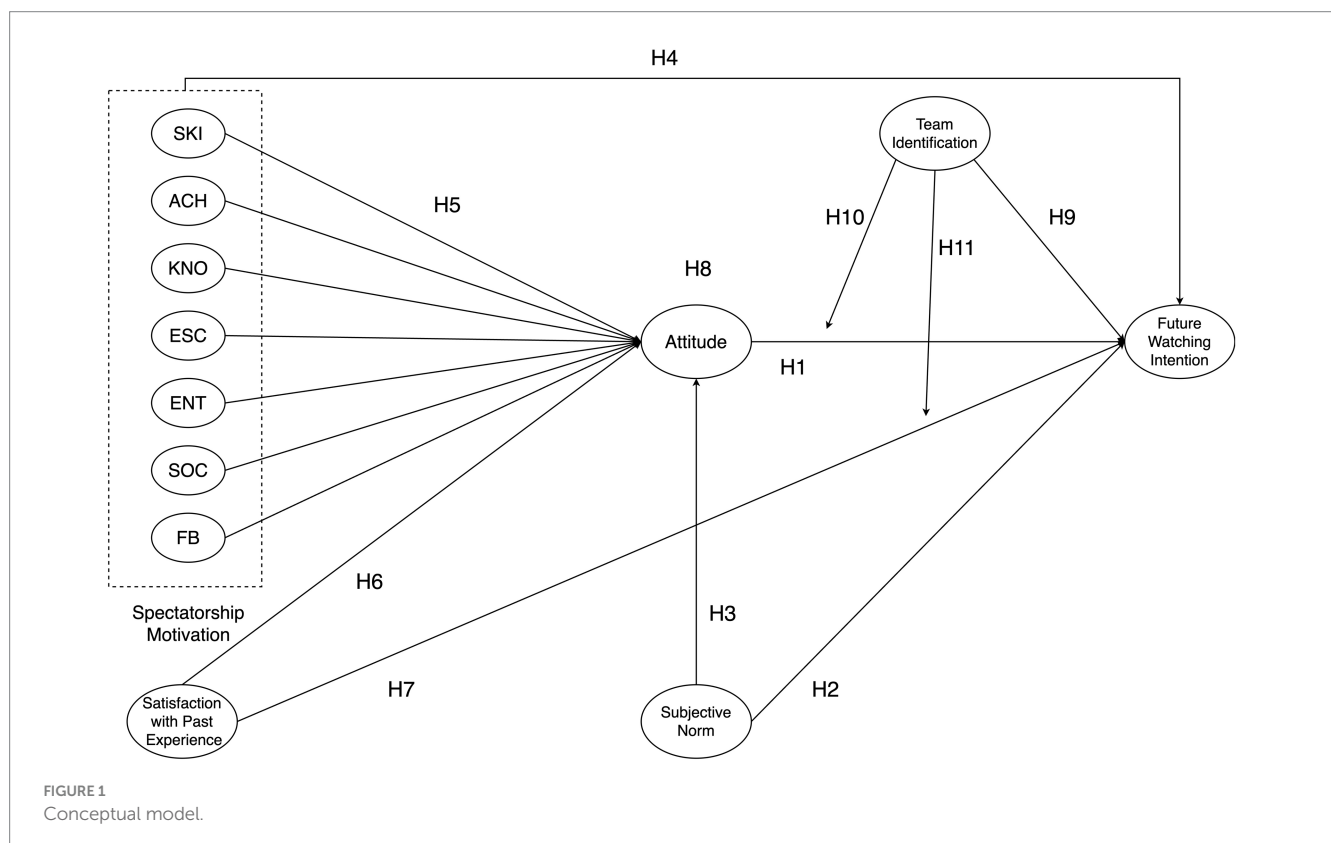
*H11: Team identification moderates the relationship between satisfaction with past watching experience and future watching intention.*

Based on the analysis, the full conceptual model is illustrated in Figure 1.

## Method

### Data collection and sample

This study collected data from October to November in 2022. In the first stage, a snowball sampling method was applied. We posted the online survey link in the game communities throughout social media platforms and also asked our friends to share the link with those who like to watch the e-sport games online. During the second stage, we recruited the respondents via an online survey platform,



Sojump.<sup>1</sup> All the participants were required to answer the screening question (whether they had watched e-sports games online before) on the first page of the online questionnaire, and 93 respondents who failed the screening questions were removed. Additionally, those who spent too much time (more than 500 s) or very little time (less than 100 s) completing the questionnaire were also removed. As a result, the final data set constituted 452 valid responses. The participants were rewarded with a monetary incentive (RMB12) after completing the survey.

Overall, the majority of participants were aged between 19 and 39 years ( $n = 411$ , 90.93%), mostly possessed a bachelor's degree ( $n = 285$ , 63.05%), and were comprised of 183 (40.5%) females and 269 (59.5%) males. Compared to FPS (first-person shooter) games, participants obviously preferred watching e-sports tournaments based on MOBA (multiplayer online battle arena;  $n = 374$ , 82.74%) games. All the sample demographics are presented in Table 5.

## Measurement

After a screening question, qualified participants were asked to report their e-sports game online spectatorship motivation, attitude towards e-sports game online spectatorship, subjective norm, satisfaction with past experience, team identification and future online watching intention for the e-sports games. All measures were rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) unless otherwise stated.

## E-sports game online spectatorship motivation

The scale for e-sports game online spectatorship was adapted mainly from the MSSC (Trail and James, 2001) and the MSES (Qian et al., 2020b). The motivations include: skill improvement ( $\alpha = 0.905$ ,  $M = 5.65$ ,  $SD = 1.02$ ), vicarious achievement ( $\alpha = 0.861$ ,  $M = 5.88$ ,  $SD = 1.12$ ), knowledge acquisition ( $\alpha = 0.759$ ,  $M = 5.95$ ,  $SD = 0.98$ ), escapism ( $\alpha = 0.849$ ,  $M = 4.90$ ,  $SD = 1.56$ ), entertaining nature ( $\alpha = 0.73$ ,  $M = 6.00$ ,  $SD = 0.91$ ), socialization opportunity ( $\alpha = 0.933$ ,  $M = 4.63$ ,  $SD = 1.60$ ) and friends bonding ( $\alpha = 0.899$ ,  $M = 5.47$ ,  $SD = 1.23$ ). Twenty-five items were employed to measure seven motivations. Example items include “watching the e-sports game online helps me become a better player (skill improvement),” “I feel proud when my preferred team (or player) does well (vicarious achievement),” “I increase my knowledge about a game by watching e-sports game online (knowledge acquisition),” “watching e-sports game online provides an escape for me from my day-to-day routine (escapism),” “I watch the e-sports game online because it is fun to watch (entertaining nature),” “I enjoy interacting with other fans online when watching the e-sports game online (socialization opportunity) and “watching the e-sports game online gives me a chance to bond with my friends (friends bonding).”

TABLE 5 Sample demographics ( $N = 452$ ).

Construct		<i>N</i>	%
Sex	Male	269	59.50
	Female	183	40.50
Age	12–	1	0.22
	13–15	5	1.11
	16–18	19	4.20
	19–22	100	22.12
	23–29	216	47.79
	30–39	95	21.02
	40–49	12	2.65
	50+	4	0.88
Education	Primary school	1	0.22
	Middle school	5	1.11
	High school	25	5.53
	Bachelor	285	63.05
	Master or Doctor	133	29.42
	Other	3	0.66
Type	MOBA	374	82.74
	FPS/TPS	65	14.38
	Other	13	2.88

## Attitude towards e-sports game online spectatorship

The measurement of attitude followed the design in Xiao's study (2020). Xiao measured the attitude of the e-sports audience toward watching e-sports using these four items. Specifically, attitude was assessed using four semantic differential scales in response to the following item: “For me, watching e-sports game online is ....” The four scale items were “Extremely bad–Extremely good,” “Extremely worthless—Extremely valuable,” “Extremely unpleasant—Extremely pleasant” and “Extremely Boring—Extremely Interesting” (Xiao, 2020). Participants provided responses on an interval scale ranging from 1 to 7, where 1 = Extremely bad and 7 = Extremely good, for example. The internal consistency of this measurement is good ( $\alpha = 0.883$ ,  $M = 5.89$ ,  $SD = 0.93$ ).

## Subjective norm

Three adapted items from Xiao (2020) were used to measure subjective norm. Examples include “I want to watch e-sports game online because my friends do so, and I want to belong to the group.” The internal consistency of this measurement is good ( $\alpha = 0.830$ ,  $M = 4.42$ ,  $SD = 1.52$ ).

## Satisfaction with past experience

Satisfaction with past experience was measured with three adapted items from the scale developed by Huang and Hsu (2009).

<sup>1</sup> <http://www.wjx.cn>

Example items include “my overall evaluation on the past experience of watching e-sports game online is positive.” The reliability of this measurement is satisfactory ( $\alpha = 0.849$ ,  $M = 5.86$ ,  $SD = 0.92$ ).

## Team identification

Team identification was measured with three adapted items from the scale developed by Jeong et al. (2021). Examples include “when someone criticizes my favorite e-sports team, it feels like a personal insult.” The internal consistency of this measurement demonstrates strong reliability ( $\alpha = 0.832$ ,  $M = 4.25$ ,  $SD = 1.51$ ).

## Future watching intention

Two items from Leung and Chen (2017) were used to measure future watching intention. Example items include “I intend to watch e-sports game online when it becomes available.” The internal consistency of this measurement demonstrates strong reliability ( $\alpha = 0.811$ ,  $M = 5.62$ ,  $SD = 1.25$ ). All the measurement items and their descriptive statistics are shown in the Appendix 2.

## Control variables

Demographics (i.e., age, gender, and educational background) and the favorite type of e-sport game to watch was controlled for in this study.

## Data analysis

We performed the data analysis primarily using Mplus 8 software (version 8.3) and SPSS 24. Specifically, we utilized Mplus 8 for conducting structural equation modeling (SEM). To ensure the validity of the measures, we conducted confirmatory factor analyses (CFA) with maximum likelihood estimation using Mplus 8 software. We assessed the validity and reliability by examining Composite Reliability (CR), Average Variance Extracted (AVE), and the square root of AVE. In this study, we employed a customized calculator to calculate the CR and AVE values, which were obtained by calculating the standardized factor loadings of items. The functionality of this calculator has been verified by the authors.

The accepted threshold values for CR and AVE are 0.7 and 0.5, respectively. All item loadings should be higher than 0.5. Additionally, the square root of AVE must be greater than the correlation with any other constructs in the model to establish discriminant validity. As all the indicators were found to meet these standards, both validity and reliability were established (see Tables 6, 7 and Appendix 2).

We also examined the fit of our hypothesized model (Figure 2) in Mplus 8. It was assessed with the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean squared residual (SRMR) (see Table 8). CFI value of 0.95 or higher, an RMSEA value of close to 0.06 or less, and an SRMR value of close to or less than 0.08 are indicative of good model fit (Hu and Bentler, 1999). In addition, chi-square statistics

and Tucker-Lewis index (TLI) were also reported to suggest a satisfactory fit.

SPSS 24 was applied to perform the hierarchical regression between the related factors and future watching intention. Furthermore, we used process 4.0 in SPSS to test the moderation and mediation effect of specific variables. By the calculation of SPSS 24, the Variance Inflation Factor (VIF) scores for all variables were between 1.063 and 3.626, which were well below the threshold of 5, indicating the absence of multicollinearity (Xiao, 2020).

## Results

### Hierarchical regression

In order to address *RQ1* and *H4*, we conducted hierarchical regression analysis to confirm the direct relationship between the relevant factors and future watching intention. The results are shown in Table 9. We found that skill improvement ( $\beta = 0.180$ ,  $p = 0.001$ ), entertaining nature ( $\beta = 0.225$ ,  $p < 0.001$ ), and friends bonding ( $\beta = 0.242$ ,  $p < 0.001$ ) were positively related to the intention to watch e-sports games online. Thus, *RQ1* was addressed and *H4* was partially supported. The results also indicated that friends bonding was the strongest spectatorship motivation among e-sports fans in China.

### Path analysis

To investigate *RQ3* and the related hypotheses, we examined the hypothesized relationships between constructs and reported standardized path coefficients, denoted as  $\beta$ . The model result is presented in Figure 3.

In our model, skill improvement ( $\beta = 0.255$ ,  $p < 0.01$ ), entertaining nature ( $\beta = 0.665$ ,  $p < 0.001$ ), friends bonding ( $\beta = 0.270$ ,  $p < 0.001$ ), and

TABLE 6 Convergent validity and reliability.

Construct	#Item	M	SD	$\alpha$	AVE	CR
SKI	6	5.65	1.02	0.905	0.619	0.907
ACH	3	5.88	1.12	0.861	0.676	0.862
KNO	2	5.95	0.98	0.759	0.614	0.760
ESC	2	4.90	1.56	0.849	0.752	0.857
ENT	4	6.00	0.91	0.873	0.618	0.866
SOC	6	4.63	1.60	0.933	0.702	0.934
FB	5	5.47	1.23	0.899	0.652	0.903
ATT	4	5.89	0.93	0.883	0.659	0.885
SN	3	4.42	1.52	0.830	0.618	0.829
SAT	3	5.86	0.92	0.849	0.622	0.832
IDE	3	4.25	1.51	0.832	0.703	0.877
INT	2	5.62	1.25	0.811	0.689	0.816

M, Mean; SD, Standard deviation;  $\alpha$ , Cronbach's alpha; AVE, Average variance extracted; CR, Composite reliability; SKI, Skill improvement; ACH, Vicarious achievement; KNO, Knowledge acquisition; ESC, Escapism; ENT, Entertaining Nature; SOC, Socialization opportunity; FB, Friends bonding; IDE, Team identification; SAT, Satisfaction with past experience; INT, Future watching intention.

TABLE 7 Pearson correlations among variables.

	SKI	ACH	KNO	ESC	ENT	SOC	FB	ATT	SN	SAT	IDE	INT
SKI	<b>0.787</b>											
ACH	0.432	<b>0.822</b>										
KNO	0.643	0.393	<b>0.784</b>									
ESC	0.265	0.355	0.238	<b>0.867</b>								
ENT	0.564	0.489	0.550	0.393	<b>0.786</b>							
SOC	0.453	0.308	0.327	0.370	0.373	<b>0.838</b>						
FB	0.511	0.436	0.409	0.386	0.527	0.628	<b>0.807</b>					
ATT	0.601	0.466	0.508	0.382	0.686	0.455	0.599	<b>0.812</b>				
SN	0.391	0.264	0.309	0.358	0.313	0.593	0.520	0.430	<b>0.786</b>			
SAT	0.584	0.434	0.473	0.354	0.711	0.428	0.583	0.807	0.392	<b>0.789</b>		
IDE	0.288	0.422	0.174	0.340	0.215	0.500	0.336	0.363	0.497	0.309	<b>0.838</b>	
INT	0.473	0.392	0.332	0.328	0.499	0.419	0.524	0.671	0.363	0.633	0.406	<b>0.83</b>

The bolded data represent the square root of AVE. SKI, Skill improvement; ACH, Vicarious achievement; KNO, Knowledge acquisition; ESC, Escapism; ENT, Entertaining Nature; SOC, Socialization opportunity; FB, Friends bonding; IDE, Team identification; SAT, Satisfaction with past experience; INT, Future watching intention.

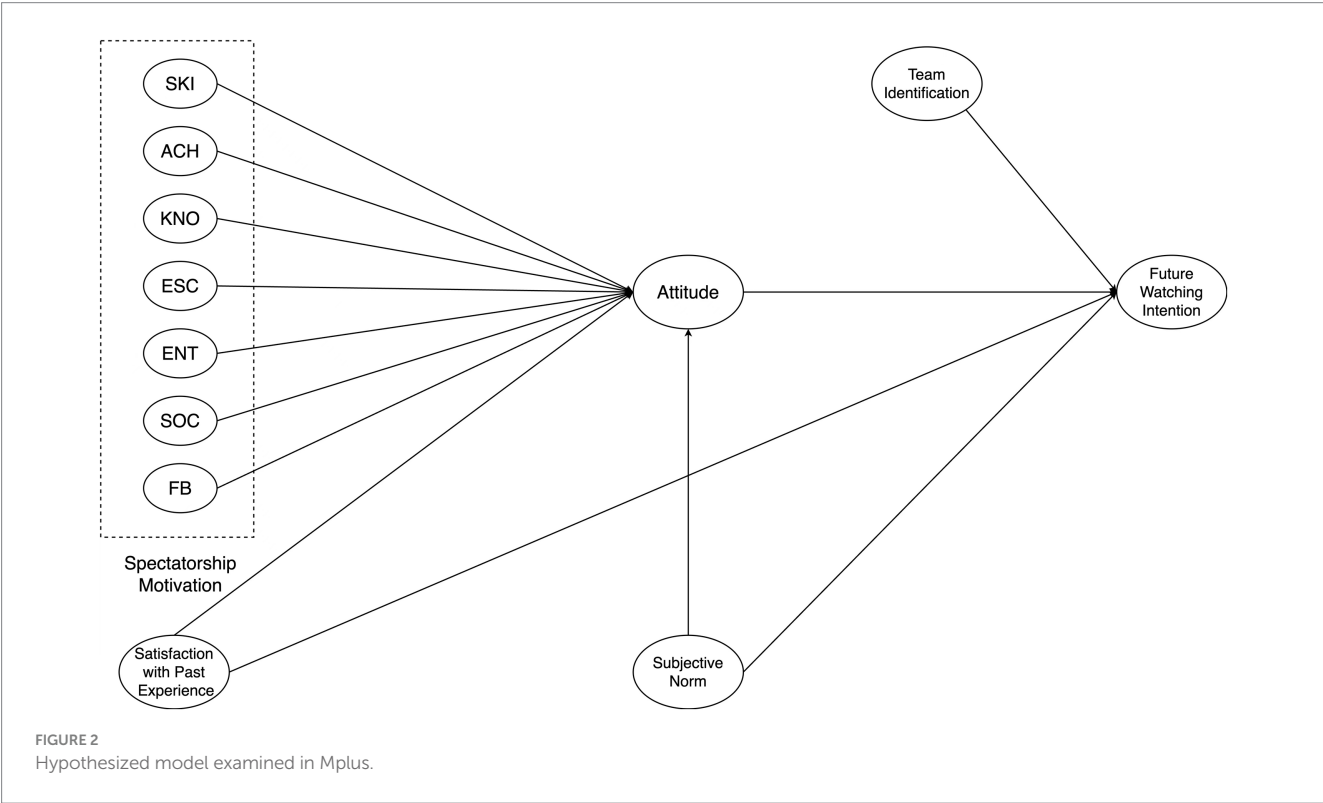


TABLE 8 The model fit.

$\chi^2 / df$	RMSEA	CFI	TLI	SRMR
1.921	0.045	0.946	0.939	0.040

satisfaction with past experience ( $\beta=0.231, p<0.001$ ) were positively associated with attitude towards e-sport game online spectatorship. Moreover, as expected, attitude ( $\beta=0.622, p<0.001$ ) and satisfaction ( $\beta=0.202, p<0.001$ ) could positively influence future watching intention. Thus,  $H1$ ,  $H6$ , and  $H7$  were confirmed, and  $H5$  was partially supported.

Furthermore, while the regression results showed a positive relationship between team identification ( $\beta=0.155, p<0.001$ ) and watching intention, this path did not reach statistical significance in the structural equation model. Consequently, we concluded that  $H9$  was not fully supported. The details would be discussed as below.

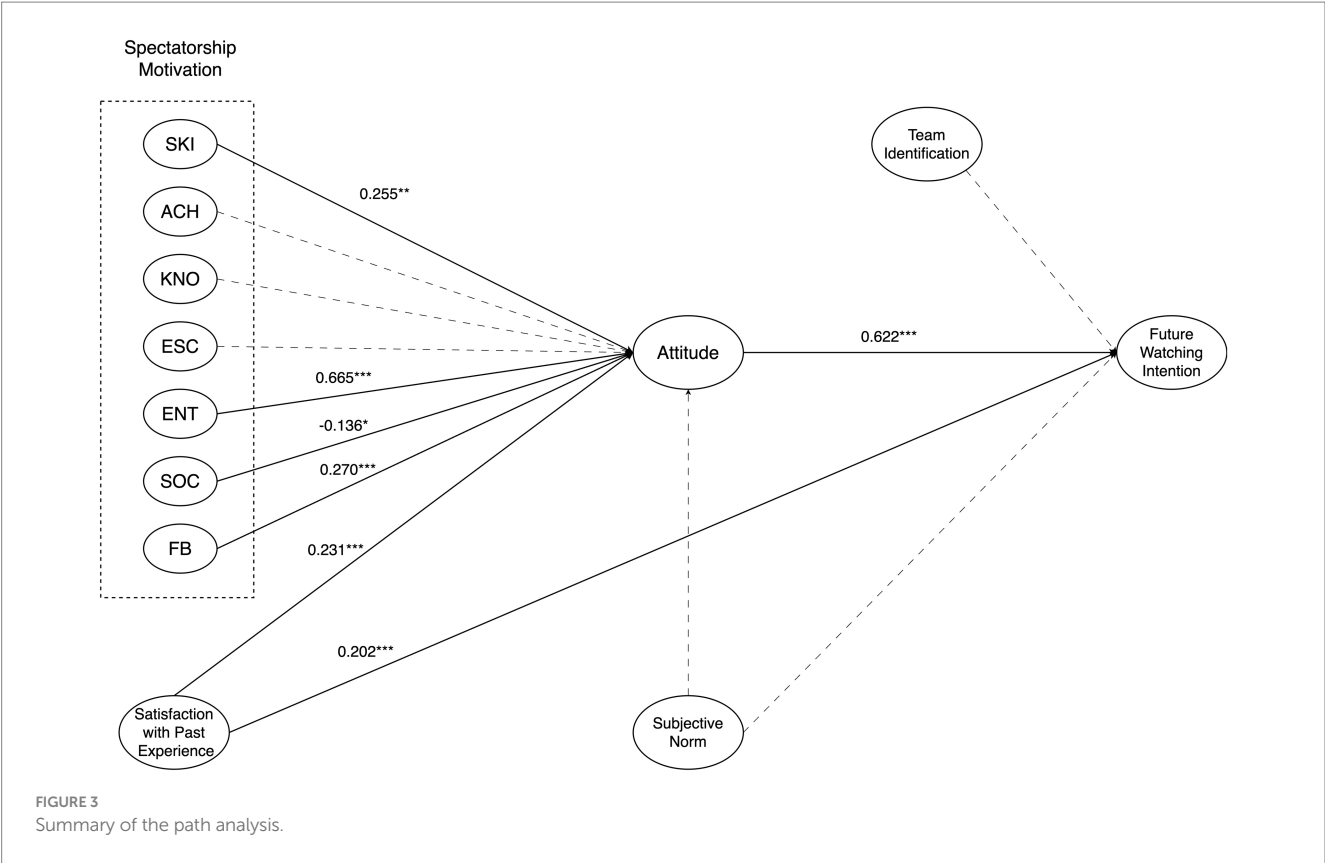
Mediation effect

Exploring  $RQ2$  and  $H8$ , we employed model 4 in Process 4.0 to examine the mediation effect of attitude. Based on our theoretical

TABLE 9 The hierarchical regression models.

	Model 1		Model 2		Model 3		Model 4	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
<b>Control</b>								
Age	0.151*	0.062	0.116**	0.052	0.077*	0.049	0.073*	0.047
Sex	0.028	0.118	0.047	0.096	0.067	0.089	0.055	0.086
Education	−0.084	0.085	−0.041	0.070	−0.020	0.065	−0.004	0.064
Type	−0.155**	0.124	−0.090*	0.101	−0.074*	0.094	−0.044	0.092
<b>Motivation</b>								
SKI			0.180***	0.067	0.095	0.063	0.068	0.062
ACH			0.085	0.052	0.012	0.051	0.008	0.050
KNO			−0.077	0.065	−0.057	0.060	−0.075	0.059
ESC			0.052	0.034	0.019	0.032	0.014	0.031
ENT			0.225***	0.071	0.059	0.075	0.003	0.074
SOC			0.053	0.040	−0.021	0.039	−0.004	0.039
FB			0.242***	0.056	0.170***	0.053	0.143**	0.052
<b>Other</b>								
IDE					0.174***	0.074	0.155***	0.037
SAT					0.398***	0.036	0.226***	0.084
<b>TRA</b>								
ATT							0.341***	0.085
SN							−0.042	0.037
Constant	5.821***	0.518	0.545	0.544	−0.25	0.515	−0.600	0.503
Adjusted R <sup>2</sup>	0.042		0.390		0.480		0.511	

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . SKI, Skill improvement; ACH, Vicarious achievement; KNO, Knowledge acquisition; ESC, Escapism; ENT, Entertaining Nature; SOC, Socialization opportunity; FB, Friends Bonding; IDE, Team identification; SAT, Satisfaction with past experience; ATT, Attitude towards e-sports game online spectatorship; SN, Subjective norm.



model, we hypothesized that attitude mediates the relationship between spectatorship motivators and watching intention, as well as the relationship between overall satisfaction and watching intention. The results confirmed the significant mediation role of attitude in the model (see Table 10). Thus, *H8a* and *H8b* were supported.

## Moderation effect

Model 15 in Process 4.0 was used to test the moderation effect of team identification. The results showed that team identification negatively moderated the relationship between satisfaction with past experience and future watching intention ( $\beta = -0.144, p < 0.01$ ), while no significant moderation effect was found between attitude and intention (refer to Table 11). That is, high-identified individuals would persist in watching the games of their favorite team, despite their dissatisfaction with their past watching experience, while the low-identified individuals are influenced more by overall satisfaction with their past watching experience. Thus, *H11* was supported.

## Discussion and conclusion

In general, this study identifies the motivations that relate to Chinese e-sports viewers' attitude as well as their watching intention, and underscores the role of overall satisfaction, attitude and team identification in the context of e-sports. Findings related to these variables will be the foundation to help future scholars develop new lines of research to understand the factors behind e-sports fans' online spectating behavior.

First, our findings imply that skill improvement, entertaining nature and friends bonding are defining motivations in the formation of attitude and behavioral intention among Chinese e-sports online audience, which differs from the previous studies mainly conducted in Western society (Hamari and Sjöblom, 2017; Kim and Kim 2020; Xiao, 2020; Macey et al., 2022). To our surprise, the motivation of

socialization only negatively influences viewers' attitude, while no influence is found on watching intention. These findings further suggest that social environment and cultural differences indeed matter in the domain of e-sports and should be considered more in the future.

Second, satisfaction with past watching experience is found to be as powerful as the three motivations (skill improvement, entertaining nature and friends bonding) in influencing the attitude and the watching intention, though often ignored in prior literature on e-sports games.

Third, our study introduces the moderating role of team identification on the relationship between satisfaction and behavioral intention. In this case, exploration of the mechanism of team identification provides a deeper insight into understanding how e-sports fandom is relevant in shaping viewers' behavioral intention. Also, the mediating role of attitude in the formation of watching intention is confirmed. Below, we will discuss these findings in detail.

## Key spectatorship motivations among Chinese e-sports fans

This study contributes to e-sports spectatorship studies by revealing the significant motivations that are associated with attitude and watching intention. Previous studies were mainly conducted in the Western and ignored some defining characteristics of e-sports game spectatorship. This study goes beyond it by creating a new list of spectatorship motivations, consistent with the context of e-sports game online spectatorship. It indicates the powerful influence of skill improvement, entertaining nature and friends bonding on Chinese e-sports fans' attitude and watching intention.

Skill improvement is the unique motive that emerges in the e-sports context (Qian et al., 2020b). Furthermore, e-sports gamers are always considered to be potential viewers of e-sports events (Tang et al., 2022), therefore it is plausible that these e-sports spectators tend to watch others play to improve their own gameplay performance (Seo and Jung, 2016; Jang and Byon, 2019; Qian et al., 2020b; Tang et al., 2022).

In addition, our study shows that the entertaining nature of e-sports game online spectatorship is associated with attitude and future watching intention, which is in line with previous work showing that esports is now considered a popular form of spectator entertainment (Brown et al., 2018; Qian et al., 2020b,c). One plausible explanation is that entertainment has a positive effect on creating pleasant emotions (Tan, 2008) and emotional gratification (Bartsch, 2012), which in turn elicits the favorable attitude and behavioral intentions (Eckler and Bolls, 2011; Foroughi et al., 2019).

Besides, it is also worth noting how esports might exert a positive impact on an existing social relationship or established friendship (Pizzo et al., 2018; Qian et al., 2020b), as our results show that friends bonding always positively influences watching intention, especially in China. On one hand, e-sports online spectatorship, as the digital counterpart of live events, provides bonding opportunities and social gratification similar to traditional sport spectatorship for e-sports fans (Qian et al., 2020b). On the other hand, because of the nature of e-sports and the relatively novelty of this phenomenon (Macey et al., 2022), the primary influencers when people first started watching esports were their close friends (Qian et al., 2020b). Therefore, it is common that sharing with close friends about e-sports games in

TABLE 10 The mediation effect of attitude.

Outcome	Mediator	Predictor	$\beta$	95% Confidence intervals	
				LLCI	ULCI
Intention	Attitude	SKI	0.351	0.271	0.430
		ACH	0.284	0.216	0.354
		KNO	0.335	0.263	0.488
		ESC	0.230	0.163	0.302
		ENT	0.404	0.322	0.494
		SOC	0.268	0.206	0.331
		FB	0.314	0.243	0.387
		SAT	0.342	0.225	0.467

$\beta$  refers to the completely standardized indirect effect; SKI, Skill improvement; ACH, Vicarious achievement; KNO, Knowledge acquisition; ESC, Escapism; ENT, Entertaining nature; SOC, Socialization opportunity; FB, Friends bonding; SAT, Satisfaction with past experience; ATT, Attitude towards e-sports game online spectatorship.

TABLE 11 The moderating effect of team identification.

	Model 1 attitude				Model 2 intention			
	$\beta$	SE	95%CI		$\beta$	SE	95%CI	
			Lower	Upper			Lower	Upper
Sex	0.083	0.052	−0.019	0.186	0.124	0.084	−0.041	0.289
Age	0.035	0.027	−0.019	0.089	0.083	0.045	−0.005	0.171
Education	−0.062	0.037	−0.135	0.012	−0.025	0.061	−0.144	0.095
Type	−0.15**	0.055	−0.258	−0.042	−0.147	0.089	−0.322	0.028
SAT	0.807***	0.028	0.751	0.862	0.294***	0.082	0.133	0.456
ATT					0.537***	0.084	0.371	0.702
IDE					0.163***	0.030	0.104	0.223
SAT*IDE					−0.144**	0.046	−0.234	−0.053
ATT*IDE					0.040	0.046	−0.050	0.131
F	175.0908***				55.122***			
R <sup>2</sup>	0.6625				0.5288			

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . SAT, Satisfaction with past experience; ATT, Attitude towards e-sports game online spectatorship; IDE, Team identification.

China not only creates an environment that extends beyond mere socialization (Funk et al., 2004), but also treated as a means of relationship strengthening (Kissane and Winslow, 2016), particularly with friends in their social circle.

Prior work on this topic found that escapism (Hamari and Sjöblom, 2017) and knowledge acquisition (Hamari and Sjöblom, 2017; Tang et al., 2022) positively predict e-sports spectatorship. Besides, escapism was found to be positively related to attitude toward watching e-sports (Xiao, 2020). These findings are entirely different from the conclusions of this study. In our study, e-sports fans in China are motivated to watch games by their competence, entertainment and social motivations, as opposed to their informational motivations (Cabeza-Ramírez et al., 2020) or escapism (Hamari and Sjöblom, 2017). The significant differences in these motivations may perhaps explain why the e-sports industry has been able to rapidly grow in China, as watching and discussing e-sports games have become a part of people's daily entertainment and social interaction.

### Satisfaction with past watching experience

In addition to extending the studies in spectatorship motivation, this study also seeks to understand the role of past behavior. Our study reveals a stable positive relationship between satisfaction and both attitude and behavioral intention.

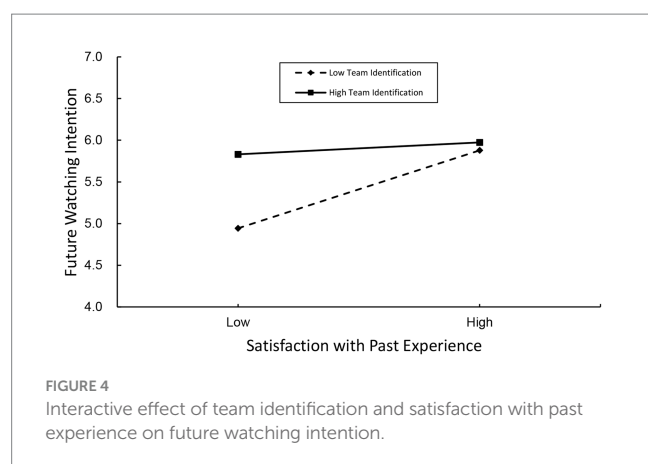
Actually, rich literature in the broad leisure industry (such as tourism) has identified the critical role of past satisfaction (Petrick et al., 2001; Huang and Hsu, 2009; Huang et al., 2015), though it is understudied in the e-sports context. The underlying assumption of these studies is if an experience has a positive effect on an individual, they are more likely to repeat the activity (Petrick et al., 2001). Therefore, it is plausible that e-sports fans may develop positive emotions associated with e-sports online spectatorship based on their prior experience, as rewatching behavior resembles a rational planned behavior, similar to what is observed in tourism revisiting behavior (Huang and Hsu, 2009).

In general, the study contributed to the understanding of past watching experience's role in future watching behavior by including satisfaction as a component of the construct.

### Explicating the role of attitude and team identification in e-sports spectatorship

This study also highlights attitude as a mediating mechanism through which spectating motivations and satisfaction with past experience are associated with future watching intention. Previous studies on e-sports spectatorship mainly focused on simply verifying the relationship between motivation, attitude and watching intention, while no one seeks to test the mediation effect of attitude and confirm the mediating role of it in the context of e-sports online spectatorship. Our study is one of the first studies to confirm the mediating role of attitude in the context of e-sports online spectatorship. Kim M. et al. (2023) explained the mediating power of attitude on spectator revisit intentions of Paralympics with the concept of sequential relationships among cognitive, affective, and behavioral components, which is common in the tourism literature (Kwon and Vogt, 2010; Wang et al., 2020). In the context of reading citizen journalism news, Lin (2014) also applied the cognitive–affective–conative framework (CAC) (Fishbein and Ajzen, 1975) to explain the mediating role of attitude in the relationship between the beliefs and behavioral intention. As motivation could be considered as a cognitive component (Kim M. et al., 2023), it is plausible that affective attitude works as a mediator on the effects of cognitive component (motivation) on behavioral intention (Wang et al., 2020).

In our study, we also found that the interaction of team identification and satisfaction with past watching experience is a significant predictor of future watching intention. As can be seen in Figure 4, both high-identified e-sports viewers and low-identified fans expressed lower levels of intention to watch e-sports games online in the future when they were less satisfied with their past watching experience. However, such reduction in future watching intention was much more pronounced in the case of low-identified



viewers than high-identified viewers. Specifically, those low-identified individuals would be influenced heavily by satisfaction with past watching experience. One possible explanation is that team identification is always strongly associated with psychological factors such as trust (Wu et al., 2012), fan loyalty (Bodet and Bernache-Assollant, 2011), and a sense of belonging (Heere and James, 2007), thus influences the perception high-identified individuals have of their own behaviors. In this vein, it is reasonable to expect that they would persist in watching the games of their favorite team, despite their dissatisfaction with their past watching experience. As for these low-identified ones, overall satisfaction plays a more critical role in their future watching intention, as a result of a lack of perceived psychological connection with a specific team. This finding is consistent with previous studies conducted in the domain of traditional sports (Bristow and Sebastian, 2001; Matsuoka et al., 2003), underscoring the significant influence of team identification on sports or e-sports fans' intentions and behaviors.

While previous research suggested that team identification positively influences future intention (Wakefield, 1995; Matsuoka et al., 2003; Trail et al., 2003), our study did not arrive at the same conclusion. This discrepancy may be attributed to differences in our measurement of future watching intention, which was not limited to watching only the games of the e-sports fan's favorite team, unlike previous studies that measured it through the name of a specific team (Wakefield, 1995; Matsuoka et al., 2003). Additionally, the development of team identification in esports is unique and always in a more fluid and dynamic way (Qian et al., 2023). This implies that investigating its precise generative mechanisms within the context of e-sports could be a promising direction for future research."

## Practical implication

Our study also provides some practical implications. First, the motivations defined in our study suggest a need for live-streaming platforms and e-sports game organizers to devote more attention to the practical, entertaining, and social value of e-sports games. E-sports practitioners should implement specific mechanisms to help viewers better understand and learn from the gameplay of professional players, such as live replays and in-depth gameplay analysis during live-streaming. Given the popularity of e-sports games as a social activity among friends, e-sports game organizers should schedule more competitive games to encourage discussion

among viewers. Second, the mediating role of attitude highlights the importance of cultivating a positive attitude towards e-sports game online spectatorship. E-sports practitioners should focus on creating a favorable attitude among spectators. Third, considering the moderating role of team identification, e-sports practitioners should aim to enhance overall satisfaction for low-identified viewers by improving live-streaming quality and reducing game pauses. On the other hand, e-sports clubs can foster loyal fans with high team identification by recruiting star players or enhancing their team's performance.

## Limitation

However, this study has certain limitations. Firstly, the sample composition is limited, and the data analysis is cross-sectional, which only reveals the interrelationships between constructs. Future studies could employ longitudinal research to examine the causal relationships between these variables.

Secondly, this study did not impose restrictions on the types of e-sports games. However, each game has its defining characteristics, and preferences for specific game types would influence spectating behaviors (Tang et al., 2022). Therefore, future research could focus on a specific game, such as League of Legends (MOBA) and VALORANT (FPS).

Third, the identification scale in this study solely focuses on team identification, while player identification and e-sports identification may also be significant factors in e-sports game online spectatorship. Future research should consider including them in the context of e-sports and exploring the e-sports fandom culture further.

Lastly, gender differences exist in this male-dominated domain, particularly in terms of unique e-sports consumption motivations (Yu et al., 2022), but this study did not emphasize them. Therefore, scholars should make more effort to explore possible gender differences in the context of e-sports.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

The studies involving humans were approved by USC-SJTU Institute of Cultural and Creative Industry Ethics Board. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

## Author contributions

MS contributed by idea generation, data collection, data analysis, and writing the manuscript. RR contributed by providing critical feedback and assistance in every part of the study, and suggestions to the initial and revised drafts. All authors contributed to the article and approved the submitted version.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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## Supplementary material

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# From legends to legacy: the impact of fan influence on retiring athletes in premier league basketball

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**Introduction:** This research examines the perceived age of Premier League basketball players as they near retirement, focusing on the complex interplay between players, fans, and the media in shaping perceptions of age and retirement. The study highlights the unique pressure on the basketball players to retire due to age-related expectations, rooted in the perception that athleticism is age dependent.

**Methods:** The research methodology applied in this study involved conducting semi-structured interviews with a sample of 11 professional Israeli basketball players and two veteran players' agents.

**Results:** Three themes emerged: (1) Feelings of betrayal and ingratitude; (2) A farewell tour toward disengagement from one's professional career; and (3) The media's role in shaping beliefs and attitudes. These themes illustrate how the sports environment portrays aging players, shaping fan opinions, both positively and negatively. Significantly, the findings emphasize the challenges that players must confront within an ageist environment.

**Discussion:** The study concludes by highlighting the cultural and social construction at work. The "coercion" to retire from professional sports is more pronounced here due to the common belief that sports success is time-bound and age-dependent, necessitating a "young body". In this reality, the audience does not merely function as a backdrop for athletes' performances, but has the power, at the collective and the individual level, to affect change on and off the court.

## KEYWORDS

basketball, retirement, age, fandom, qualitative study, body, media, Israel

## Introduction

The age of athletes plays a critical role in shaping not only how they are perceived by others but also in influencing their self-perception. This becomes increasingly evident as athletes approach retirement, their age becoming a central theme in both public discourse and professional discussions. One of the most pivotal aspects in this context is the dynamic relationship between fans and athletes. This relationship is heavily influenced by how fans perceive an athlete's skills, expectations, and behaviors. As highlighted by Cosh et al. (2013), athletes typically retire at a relatively young age, a phenomenon often driven by the prevailing norms within specific sports. Consequently, age emerges as a primary determinant of retirement, frequently limiting an athlete's autonomy in determining their career trajectory. Understanding the roles played by various social agents in the realm of sports, as well as the experiences of athletes during the latter stages of their careers, carries both theoretical and practical implications. Despite its prevalence and significance, this particular aspect, which forms the central focus of the present study, has been largely

underexplored in academic research. Consequently, this study aims to fill this gap by providing a comprehensive examination of how basketball players perceive the treatment they receive from both fans and the media.

## Sports fans

Sports fandom is an exceptionally widespread, cross-national and cross-cultural phenomenon, considered unique in many respects, and has therefore captured extensive research attention in recent years. The fundamental presumption, which constitutes a solid foundation for research centered on sports fans' behaviors and speech, is that sports function as authorization zones for fans (Ben-Porat, 2014), granting fans the legitimacy to behave freely and spontaneously in ways that are unacceptable outside the stadium. Therefore, an analysis of fans' behaviors or discourse can reach beyond the politically correct dialog that characterizes many societies (Sorek, 2019) and capture authentic thoughts, attitudes, and opinions. The ethical perspective that is acceptable in the world of sports is that fans occasionally have additional rights related to the negative ways in which they express their fandom, such as curses, insults, and jeering directed to the rival team and even to its players (Smith and Lord, 2018). According to Marmo (2012), such communications between fans and players not only affect players' performances but also their cognitive functioning. Extending beyond elevating or reducing players' motivation, the audience also affects players' attitudes and perceptions, including their self-concept, as discussed below. For sports fans, their team is an important component of their lives and their fundamental identity (Tamir, 2022). Fans will accompany their team in all circumstances and to almost all places, making enormous sacrifices for the team, even going so far as to sacrifice their health for the team (Levental et al., 2021). In addition to encouragement and support, fandom practices may also manifest as violent behavior and badgering players and rival fans (Duncan, 2019). At the same time, fans might lavish compliments on certain players and mark players as heroes based on their traits and behaviors (Levental and Nudelman, 2021). Thus, the audience does not serve merely as a backdrop to players' performances, but actually affects diverse elements and actions that occur in the competition sphere, at both the group level (Unkelbach and Memmert, 2010) and the individual level (Marmo, 2012). The impact on players also depends on the players themselves, but fans may directly affect a player's self-image and, consequently, the player's professional performance (Heaton and Sigall, 1991). Fans' interest in and commitment to their team also drives a hunger for information related to the team and its players, and anything surrounding them (Aiken et al., 2018). As a result, sports media have become one of the most popular, significant, and influence sectors of the media industry (Tamir and Lehman-Wilzig, 2023). It is therefore unsurprising that studies have identified media consumption's effects on sports fans, on various levels, from basic information to fans' identity and identification with a team (Phua, 2010).

Media framing theory is considered one of the most well-known and influential theories in the study of media effects. The theory deals with the question of how the media mediates reality to the audience. The premise is that the media creates the nature of the discourse, and public opinion absorbs and internalizes it. Framing is defined as the way in which a media source defines, organizes, and structures the media information, so that the sequence of events covered receives broad context and meaning (Gamson and Modigliani, 1987). Framing can be done intentionally and with the knowledge of the addresser, but it can also be done subconsciously (Gamson, 1989). But the basic assumption

is that in any press coverage, the media applies certain media frames to the happenings. According to Entman (1993), the act of framing includes four functions: (a) defining a problem (b) diagnosing the causes (c) moral judgment (d) calling for action (proposing a solution). And so, the frame becomes an interpretive scheme that affects the reader and allows him to identify, label, process the events and store the information for the long term. Media frames are constructs that align with the preexisting mental frameworks of public opinion to the extent that the audience comprehends the cues presented in the media effortlessly, often without conscious awareness (Entman, 2004). In the particular context of older athletes, whether conveyed through traditional communication channels or within the discourse of new media, including social networks, the coverage on aging athletes frequently accentuates their age, effectively framing the narrative around this aspect (Carmack and Lazenby, 2023). In this respect, sports media's framing of complex issues related to a sports player's identity, and to sports in general, has a strong impact on media consumers' social perceptions (van Sterkenburg et al., 2010).

According to Hasaan et al. (2016), mass media and interpersonal communications are key components in the construction of an athlete's personal brand. These media are the primary means for shaping fans' perceptions about certain players and therefore have a broad effect on a player's public image and self-image. In turn, a player's image directs fans' attitudes toward a player and their consumption behaviors in general (Vieira and Sousa, 2020). As Arai et al. (2014) note, the athlete's brand is influenced by their on-field performance and external factors like their appearance and conduct outside the sporting arena. However, this branding is dynamic as it is directly influenced by perceived factors such as successful performance on the court and, to a large extent, by differences in the player's career stage (Hodge and Walker, 2015). It should be noted that over the past decade, there has been a notable surge in the utilization of social media as a tool for bidirectional communication between athletes and their fans, particularly in response to the COVID-19 pandemic (Su et al., 2020). Effectively using social media can influence players' engagement with both fans and teammates, contributing positively to a player's branding (Doyle et al., 2022). However, the present study aims to concentrate on the immediate and unidirectional relationship within sports arenas and the combined impacts of the audience stemming from their behavior.

The genesis of Israeli sports and the affiliation of fans to their beloved clubs were initially rooted in deep political involvement (Galily, 2007). However, trends of commercialization and professionalization, especially during the 1980s, led to a distancing from ideological affiliations and to the emergence of a global fan culture (Ben-Porat, 2000). Despite the processes of sports fandom globalization, there are still cultural components that manifest, including militarism prevalent in Israeli society, entering the realm of fan culture (Roth-Cohen and Tamir, 2017), as well as idealized perceptions of athletes (Levental et al., 2022). These factors do indeed impact fans' expectations of players but are not fundamentally different from the branding processes undergone by top athletes worldwide. Therefore, the current research discussion in the Israeli context is not necessarily shaped solely by the local context but describes a commonly accepted dynamic between crowds and players during games.

## Athletes, age(ing), and retirement

It is common knowledge that a professional sports career is both contingent on and limited by one's biological age, more so than in any

other profession. While considerations of retirement in other professions are not necessarily considered to entail one's body, retirement from professional sports is intuitively considered a "natural" process that occurs at relatively young ages.

Webb et al. (1998) argued that athletes have two types of sports identities: a private identity, which refers mainly to an athlete's personal feelings and emotions, including their self-image, and a public identity, which refers to the ways in which the athletes perceive their popularity and public admiration during their professional career. A study on professional athletes' identity and retirement illustrates this distinction (Lally, 2007). Lally argued that in anticipation of their transition to life after a professional career, athletes begin to negotiate "a redefinition of the self" (p. 12). The external aspects of body presentation and age, which mediate between the individual and their social identity as they approach retirement, are largely shaped by the athlete's efforts at impression management (Lev and Weinish, 2020; Weinish and Lev, 2021) in advance of their retirement. According to Goffman (1959), both the individual and the environment participate in socially constructed patterns, in which they are mutually recognized and assessed, and positioned in social contexts and power structures. In circumstances where elite athletes may experience a drastic decline in their self-image and competitive abilities after retirement (Stephan, 2003), they must be vigilant about the external performance dimensions as a means of self-presentation to others. Relatedly, Jones and Denison (2017), who studied soccer players who had retired from England's premier league, discovered that the retirement process was not only a challenge but also a source of relief from their need to manage their body. Age as a stratified element thus become a major factor in the course of a professional athlete's career. In this context, the concept of ageism is often associated with terms such as "stereotypes," "prejudices," "stigma," "racism," and "discrimination" when discussing "old age" and "the elderly." Most studies align with Butler's (1969) definition of ageism, which characterized it as a process involving the stereotyping and systematic discrimination against individuals solely due to their advanced age. In a more contemporary interpretation, ageism is defined as a complex amalgamation of various facets, including a sociological assessment of unequal distribution of resources and access to them, heightened awareness of the emotional consequences of this exclusion, societal critique of biases and discriminatory patterns, and the disadvantaged legal status often experienced by elderly individuals (Hazan, 2013). More specifically regarding athletes, it therefore appears that of a wide spectrum of professions, "athletes constitute an extreme example of this, as their physical ability reaches a competitive peak at an extremely early chronological age" (Hazan, 1984).

Kama and First (2015) argued that older populations inescapably become a powerless group characterized by a negative image, and experience symbolic extinction and disregard on the part of the media. Although in their study they refer to adults at the end of their lives, while this study focuses on young people at the end of their professional career, it is notable that attitudes toward professional basketball players approaching retirement is similar to the treatment that older adults receive.

According to the stereotype embodiment theory, people internalize socially generated stereotypes about aging into their perceptions of their own aging which can lead to self-fulfilling prophecies that have a negative impact on their health (Levy, 2009; Silver, 2021). For athletes, retirement is considered to be a critical stage in one's career, and has accordingly attracted research attention. Considering athletes' extensive public exposure and attention, it is understandable that

retirement is accompanied by multiple social, physical, and mental challenges and difficulties and benefits (Jewett et al., 2019). Wippert and Wippert (2008) reported a significant and systematic decline in athletes' self-reported stress immediately after retirement.

Mihovilovic's (1968) pioneering study adeptly described the difficulties and anguish before retirement from professional sports, but studies show that retirement is perceived to be much less problematic when it is planned as a process rather than an event (Torregrosa et al., 2004), and that pre-retirement planning that takes into account the psychological, financial, and other implications of retirement significantly contributes to the quality of the transition and to athletes' adjustment to their post-career status (Warriner and Lavalley, 2008). Moreover, a redefinition of the self, through proactive diminishment of one's pre-retirement athletic image, can be very beneficial in this process. Nonetheless, in many cases, retirement is accompanied by a sense of confusion and loss of identity, which may persist for many years after retirement (Kerr and Dacshyn, 2000). However, it should be stressed that these factors vary from one cultural context to another, where characteristics of specific social contexts can serve as a resource or barrier to athletes in advanced career stages (Alfermann et al., 2004).

The current study focuses on the specific social context of basketball players in Israel and explores the audiences' role in professional basketball players' retirement process.

## Methodology

### Participants

The study's objective is to gain an understanding of how Premier League basketball players perceive age as they near retirement and to explore the role played by their fan base in this transitional process. Eleven professional Israeli-born basketball players participated in the current study and two veteran basketball players' agents. Their mean age ranged from 30 to 40 years and playing experience ranged from 14 to 22 years. The first six interviewees were recruited by the first author, a former professional basketball player in Israel's First (Premier) League, who was then referred to an additional five participants (i.e., snowball sampling; Sparkes and Smith, 2013).

Name	Age	Living area	Position
Nimrod	31	Tel Aviv	Player
Eran	32	Tel Aviv	Player
Shlomi	34	Tel Aviv	Player
Dennis	39	Tel Aviv	Player
Amit	32	Tel Aviv	Player
Ronnie	35	Tel Aviv	Player
Eli	33	Beer Sheva	Player
Haim	33	Northern Israel	Player
Elad	31	Northern Israel	Player
Orr	34	Northern Israel	Player
Oren	35	Northern Israel	Player
Michael	41	Tel Aviv	Agent
Yossi	43	Tel Aviv	Agent

## Instruments

Materials from the field were collected using semi-structured interviews. Semi-structured interviews were employed because they offered the interviewers a large degree of flexibility in posing spontaneous questions on how older basketball players perceive the late stage of their career. Moreover, semi-structured interviews are a vital source of rich knowledge and encourage participants to relay personally meaningful experiences in which they divulge noteworthy aspects of human behavior in everyday life (Brinkmann, 2013). The players were asked mainly about the way they perceive the treatment they receive from both fans and the media (e.g., How do you perceive the influence of fan expectations and reactions on basketball players' decisions to retire or continue their careers? How does the pressure of meeting fan expectations affect players' self-image as they approach the end of their basketball career? How do you perceive the role of media coverage and scrutiny in shaping players' decisions to retire or prolong their career? How does media coverage and public opinion affect players' self-image, motivation, and confidence as they approach the end of their basketball career?). The duration of each interview ranged from 45 to 75 min. Participants were selected on the basis of their relationship with the first author, and their willingness to serve as key informants and share their firsthand experiences. The questions for the semi-structured interview were designed by the first author. His background as a former professional basketball player in Israel's Premier League provided him with a unique insider/outsider perspective. This perspective was invaluable in understanding how professional basketball players perceive age as they approach retirement and the influence of their fan base in this context. Prior to each interview, participants were informed about the study's aims and methods. The interviews were conducted in Hebrew and translated into English by the researcher.

## Data analysis

The present study employed the thematic analysis method to comprehensively examine the data and identify prominent themes within a dataset. The purpose of this analysis was to elucidate and interpret the underlying meanings and significance of these themes (Braun et al., 2016). The analytical exploration of the data involved immersing in the transcripts, coding the data, and generating themes. An inductive approach was adopted, whereby themes and patterns emerged from the data itself. Additionally, the analysis engaged with the data on a latent level, focusing on underlying ideas, beliefs, and perspectives that were not explicitly expressed. While most thematic analyses encompass both latent and semantic coding (Braun et al., 2016), the latter was occasionally employed in this study to decode explicit concepts, ideas, or patterns directly evident in the data. Through the organization of data into higher-order themes, certain codes were examined and subsequently amalgamated to shape overarching themes. For instance, the code "Fan's Behavior Outside the Arena" was integrated with the theme "Feelings of Betrayal and Ingratitude." The following overarching themes were identified: A sense of betrayal and ingratitude, a farewell tour in anticipation of one's disengagement from one's professional career, and the media's role in shaping the player's image as they approach retirement. Our theme development process involved a continuous examination of

fundamental inquiries: (1) Identifying the core essence of each theme, (2) assessing their meaningful contributions to both the dataset and our research questions, (3) establishing clear boundaries for each theme, and (4) ensuring thematic coherence. With these well-defined themes in hand, our attention turned to crafting integrated explanations across the overarching themes. This phase involved in-depth exploration of the relationships between themes, probing how they intertwined to construct a comprehensive and nuanced portrayal of the data. As these themes were described and contemplated, relevant literature was employed to establish connections between the themes and the societal experiences of the linkage between professional basketball players toward the end of their career and their relationship with fans, thus encompassing the findings.

## Ethical requirements and quality assurance

Several steps were taken to ensure the study's compliance with ethical standards. First, approval was obtained from the institutional review board. Participants provided informed consent, using common pseudonyms to protect their identities and to clarify the gender of each participant for readers. To ensure quality and trustworthiness, Tracy's (2010) eight hallmarks for high quality qualitative methods across paradigms were implemented. Relevant theoretical foundations were applied to achieve the study's objectives, methodology, and findings. More specifically, the first author conducted iterative readings and deeply immersed himself in the transcripts. Following this, a collaborative approach was adopted to analyze the material and resolve any disparities with fellow researchers, resulting in the creation of a final, cohesive version of the coded notes. This procedure was iterated until a list of themes was supported by consensus to represent the data.

## Findings and discussion

### Feelings of betrayal and ingratitude

The first theme addresses the dialog between the players and their audience, and specifically the audience's attitude to the players considered past their athletic prime. Because the player does not necessarily concur with this assessment, the player views the fans' statements and behavior as unfair and in violation of the traditional function of fans, which is to support the team and its player in all circumstances (Tamir, 2022). From the player's perspective, withholding support is equivalent to betrayal and reflects fans' ungratefulness for the player's investment of time and effort in the game and the team, and the player's efforts for the fans. Nimrod, a 31-year-old basketball player, described his bitter experience with the fans during one game:

I was in what might be the most difficult situation in basketball... I faced 3,000 comments in the arena, shouts, curses: "What are you doing?!" "Go home!" "You're a nothing!" from the supposed fans of your team... and it's a very difficult experience... very difficult... especially for someone who is very self-critical and very sensitive about things like that. It was very, very difficult. These were sharp, personal remarks and insults.

Eran, a 32-year-old basketball player, also described the importance of a player's approach to such retorts:

It [the audience's remarks] really affected me... not necessarily just those about my age.... If, for example, they shout something like "Old man, retire," then I will retire, you know? From time to time, they would call me "fatso" and stuff like that, you know how it is, they are always looking for something.... My whole life, if someone put me down, it only made me stronger, so then I go out there to prove it – here, I'll beat you now.... Still, I say, when a guy is 31, 32, what do you want from him? I really do not get it, I do not get it, I told you – it's a matter of attitude. It's something that you cannot explain. I told you that the biggest problem is that maybe they are all right. After all, you see that you are still here, but you tell yourself, "maybe they are right and I really am finished."

The taunts on the court are the main dimension in the process in which the players, their self-image, and their qualifications are affected and shaped by the audience (Marmo, 2012). Eran chose to deal with the offensive comments in a positive manner by constructively using them to motivate and drive himself. But this is no more than an optimistic approach to a process to which he is fated by his age. The audience's taunts clearly affect Eran's self-image. The words "maybe they are right and I really am finished" are indicative of the enormous power that the fans and spectators hold, and already enfold capitulation on Eran's part. They also resonate with the stereotype embodiment theory which posits that stereotypes are embodied when they are absorbed from the surrounding environment, subsequently shaping self-definitions that, in turn, influence one's functioning (Levy, 2009). These two above quotes from interviews reflect two approaches to a common experience. On the one hand, players accept the remarks from the bleachers as a natural and integral part of the game and the circumstances, something that they should respond to with restraint and even acceptance. On the other hand, according to the second quote, these remarks cause a serious emotional wound. As the findings show, the insult is especially biting because players expect their team's fans to express support, which is why such remarks are considered to symbolize the fans' betrayal of their role, and specifically their betrayal of the specific player in question. Although the fans' remarks are received differently in these two approaches, all players are sharply aware of the taunts, curses, and remarks that come from the audience. It seems that players not only hear the taunts but are also directly affected by them (Epting et al., 2011).

Further, fans have the power to transform a player into an icon and to appropriate a player on behalf of a specific city; however, when a player exceeds the age of 30, his credit with fans diminishes and the spectators' impatience with the player increases.

In his interview, Nimrod recounted that he feels very frustrated by the fact that, for the first time in his life, the people around him – the audience, media, and his family, ask him questions related to his retirement:

People suddenly ask me, "When are you going to retire?," "What do want to do afterwards?," "Does not anything hurt?," "Isn't there anything that bothers you?," "Isn't it difficult for you?," "All kinds of questions like that. People ask: "Are not you worried that the younger kids are trying to nip at your tail?," Listen, it finds a mark!

It seeps in. Let us say this, there's no doubt about it, you suddenly start thinking about your career, about the next thing. It seeps in, mainly into your thoughts.

The direct remarks described by Nimrod and by Eran hurt the players and undermine their self-image. The audience's behavior can be explained by the "role" that the audience appropriates for itself as a contributor to the team's success and by its identification with the success of the player's personal accomplishments and image (Tamir, 2022). This is reflected in fans' efforts to sit in the bleachers and wear a player's shirt, for example. A decline in a player's performance as the player ages triggers counter-responses against what the audience believes is the player's failure. Frequently, fans will wait for players outside their locker room, and after a bad game, fans might gang up on the player, curse him, and call him insulting names. Such incidents become embarrassing when the player is accompanied by family members. In this reality, dramaturgical demands of high-profile athletes who work in high publicity, visible contexts, become relentless and unrelenting, as back-stage regions become fewer and further between (Roderick and Allen-Collinson, 2020). Such incidents and such taunts have a substantial impact on the player's conduct, through their influence on the player's emotional responses and self-image.

It appears that a player's perceived age is directly related to the way the player is perceived by society. An athlete's age is a critical factor in the management of their professional career, and at some point, players may become labeled by their age rather than by their personal accomplishments (Lally, 2007). The other aspect of a player's stress, expectations, signification, and commercialization emerges when the audience becomes an obstacle in the player's career, when the audience's taunts and sarcastic remarks from the bleachers reduces the player's time on the court. In rare cases, fans' discontentment with a player might even lead to the player's dismissal. In this way, the audience causes a double harm: First, to how players perceive themselves at this stage of their career, and second, the impact on professional issues that are reflected in the player and in the training crew (Stephan, 2003). In view of the dissonance between the athlete's self-efficacy and the audience's beliefs, the players feel as if they are receiving no support from the spectators who are ungrateful for the player's past and current investments. Because the accepted view is that players are obligated to invest their talents and abilities into the game and fans are obligated to appreciate players' efforts, players sense that such remarks fundamentally violate the formula and belittle their personal commitment. Such a feeling is not associated only with a specific point in time but seems to completely discount players' enormous investments over the course of their career. Players expect recognition and respect, not only for their current performance but for the long-term contribution, which is also a symbol of their commitment to their club and their fans.

In summary, the findings are consistent with Hazan's (2013) multifaceted definition of ageism, particularly in terms of highlighting the psychological sensitivity to the emotional consequences of exclusion. In this reference, it is evident that basketball players encounter prejudices and discrimination within the sports community, often facing stereotypes about their age and perceived physical decline. Nimrod's statement, "It was very, very difficult. These were sharp, personal remarks and insults," highlights a clear connection to the challenges that basketball players confront due to ageism. They endure emotional consequences when excluded

from their once-inclusive environment, primarily because of their age, which significantly impacts their opportunities within the sports arena. This type of exclusion, particularly from fans who were once their staunch supporters, proves emotionally distressing for them.

## A farewell tour toward disengagement from one's professional career

In contrast to those fans who express derision, as described above, others will express positive feelings for older players, whom they consider part of the team and whom they undoubtedly associate with the team's history. For these fans, players are viewed as the soldiers who battle on behalf of the team and its fans, and many times become heroes (Levental and Nudelman, 2021). Although both types of response are driven by a recognition of a player's older age, this recognition is expressed differently in both cases. For the second group of fans, curses and taunts are replaced by indications of admiration and respect. The relations between the audience and players follow unwritten rules related about each side's commitments. Players are required to honor their fans and the audience through their performance on the court, and in exchange, players gain honor and support that position them as admired and revered members of the team. In view of this implicit contract, players feel that they cannot afford to disregard their fans even if the latter's conduct borders on harassment, badgering, or behavior considered unjustified. Such fandom is not limited to the bleachers and occasionally manifests in the public sphere, outside sports arenas. It is important to note that while this type of relationship applies to all players, attitudes to older players change and manifest in ways that do not emerge with respect to younger players. Experienced basketball players sometimes become figures with whom fans love to identify, and frequently become a symbol that connects the team to its audience and to the media (Levental and Nudelman, 2021). In his interview, Shlomi, a 34-year-old basketball player focused on a description of the informal rewards that players might receive during their career:

I would go to entertainment spots...that respect you, if you can call it that.... Like, "come to us Shlomi ... you go to some place... people clear the way for you. Great, come in, bring your friends" ... some two or three guys show you respect, invite you. There were lots of places that naturally tried to attract you. It boosts your ego a little...it gives a kind of push to your ego.

Additional aspects of the inter-relations between players and the audience are reflected in statements by Dennis, a 39-year-old National Team player. He has played in Israel for over a decade, is married and has two children, and fans in Israel and Europe consider him to be one of the most loved and admired players in the league. He describes the relations between a player and the audience as follows:

I think the fans are the reason you play the game, you give back to them on the floor, you know – you play with your soul, and you see how much they care about the team. You just wanna give back to them, so yeah, I'm really connected. For me it comes easily – you want to give them the respect they give you, that's why I'm

always cozy with them. They want autographs, pictures, they see you on the street, you are driving in the car, they are waving... it's really good to be loved.

Interviewees recounted that they often remain in the arena after a game to shake fans' hands, take photographs with them, and hand out autographs after other players leave the court. Many times, such practices will position older players as their team's ambassador. Occasionally, players' rich experience and history position them as team symbols even if they do not actually receive extensive game time. When older players come onto the court after a game has been effectively decided and there is no real significance to their presence, their entrance will be applauded by other players, the team staff, and especially the fans in the audience, who will greet the player warmly with praise and smiles that would not be doled out if he were younger and considered in his prime. Dennis stated that many times he would come onto the court with an apologetic smile, reflecting his discomfort at being in the spotlight. All he ever wanted was to shoot baskets and contribute to his team's statistics, as expected of a young early-career player.

Dennis' discomfort reflects the change in the natural relations between authentic fandom and players' investments and contributions to their team. The give-and-take of this relationship is replaced by demonstrations of the fans' respect for the player's sports history rather than for the player's current performance. In this reality, symbolic items such as souvenirs and merchandise related to a player often have significance. For example, despite Dennis' age and his limited presence on the court, his uniforms were in extremely high demand because as team captain, he was the player most strongly identified with the team, its fighting spirit, and its loyalty to its fans. All in all, it seems that the interviewees acknowledge the fragility of this relationship and its reversibility. Players sought a balance between a desire to totally devote themselves to this relationship and their recognition that the relationship is a temporary one. The interviewees' statements reflect the lack of trust they have in this uncertain relationship, which wavers between love and hate between a player and the fans over the course of his career. Also evident is the older players' resignation and acceptance of the loss of their glory and fame (Jewett et al., 2019).

One case that attests to this nature of the player-audience relationship was a decisive game between Hapoel Tel Aviv and Maccabi Tel Aviv in the 2022/23 season. In this game, when the score had already been decided (often referred to as "garbage time"), Guy Pnini walked onto the court for the first time in that game. Guy is the former Maccabi Tel Aviv captain and one of the team's most senior Israeli players in recent history. His participation in the game was not based on professional considerations but motivated by a desire to show him respect and give fans an opportunity to demonstrate their admiration and respect for him. Although the situation was obvious to all and is a well-known practice in the world of sports, it structures the specific social roles within the player-audience relationship. The audience is required to honor the player, but not for the performance, while the player understands that the audience's adulation is granted for other periods of his career. The player senses that the final chord in their career is approaching, but, as the interviewees noted, the player typically believes that a summary of their career is premature.

## The media's role in shaping beliefs and attitudes

The two themes noted above are related to fan behavior toward older players. A question arises, however, regarding the process through which fans develop their attitudes toward the players. When do fans develop a belief that the retirement of an older player is approaching? Although this may be inferred from the length of a player's time in the game (based on the coach's professional considerations) or a decline in the player's performance (based on subjective and quantifiable measures), the findings of the current study confirm that the media play a decisive role in shaping fans' options, in line with findings of previous studies (e.g., [Phua, 2010](#)). As articulated by [McCombs \(2004, 2005\)](#), the media not only inform us about what to think but also guide us in how to think about it. Specific attributes can strike a chord with the public to the extent that they evolve into particularly persuasive arguments for emphasizing the importance of the subject, individual, or topic in question. Within the sports domain, the rhetorical framing of athletes prominently depends on age as a representation of experience, as highlighted by [Carmack and Lazenby \(2023\)](#).

One example of how the media use stereotypes to construct a player's profile, and to a large extent also the character of a team, occurred during a season hiatus, when the daily newspaper *Haaretz* published an article about Maccabi Ashdod, a team with two senior players over the age of 30, under the headline "Let the Veterans Play Before Us" (*Haaretz Sports*, July 5, 2011). The headline is a paraphrase of the well-known biblical phrase, "Let the young men arise and play before us," which expresses a disparaging attitude toward inexperienced people who try to engage in practices in which they are unskilled. Attributing the image of incompetency to the team's older players implies that they are no longer able to perform in the tough league due to their age, and are no longer able to move, shoot baskets, or perform other roles that require dexterity, concentration, and physical contact, because their bodies are no longer young or agile. According to this article, "The team needs a mix of young people and responsible adults. Ashdod would be wise to put some new blood next to the older ones." In the eyes of the media, if the team wishes to be successful it should sign young players, this would help the older players maintain their relevance and contribute added value to the team, and they would become the "responsible adults." Another example that reproduces the "old player stereotype" is the question posed in the secondary headline: "Can a reduced ego and extensive experience compensate for a weakening body?" In this manner, the media structure players' retirement around stereotypes related to age and physical decline, which are framed as the sole cause of retirement from basketball ([Vieira and Sousa, 2020](#)).

The interviewees in the current study describe a similar picture regarding the media's role as a consciousness-shaping mechanism. All interviewees acknowledge the media's power, their practices, and their use of rhetoric, and mentioned specific cases in which the media criticized them, specifically referencing their age. Yossi, an experienced agent explained:

I talked to a player, and he says, "Tell me, how can that son of a bitch [from the media] say that I'm done? Come on, I still do 12 min in a game, did not you see how I guarded him?... It's enough for two people from the media to say it for everyone to follow them... it has an effect on [other] teams' views." All day they think: "Enough, he's at the end of his game. He cannot move his

feet, enough, stop, stop, stop...so then you are considered a player who's over the hill, and your financial offers will be accordingly."

Shlomi offered a similar description:

The media...every time they broadcast a game, they talk about your performances, "He's an old man, he's old, he is not what he used to be...." Look, it's natural that they try to push the young ones and look for the next stars... the next big thing... but somehow in that period, which is quality time for players... and they are at the peak of their performance mentally, and also physically, I think, they are at a very high standard at 30–32. Their physical [condition] is ideal. You know, [at that age] you know your body best of anyone, you know how to take care of it, you know how to train, you know when to stop training, you are in the best place you can be.

The interviewees expressed their frustration for having the label of "aging basketball player" attached to them. Labeling affects the way a player's image is presented to media viewers and readers ([Hasaan et al., 2016](#)). A uni-dimensional presentation of a player's age in bureaucratic and stereotypical terms defeats the player who then succumbs to this image of an "aging player" in the retirement phase. A decision to retire against the player's own personal wishes indicates that the player has succumbed to the image that the media constructed.

The tendency to criticize active players is reversed when a player announces their retirement. In Dennis' case, for example, when he announced his decision to become a coach, the media's response was generous and kind, exalting his achievements. The media's support for this announcement illustrates its position as a key player in creating a player's public image. After the media satisfied its own needs, they were able to glorify Dennis' past and build up his image, catapulting him toward a new, more "respectful" and age-appropriate career. The following quote is taken from one of the dozen articles related to Dennis' extensively covered retirement announcement:

One looks at [his] list of achievements and it is obvious to us all that he is a star. Perhaps the only one who enjoys a consensus of love, including from his colleagues...his sacrifice, fighting spirit, winner mentality, talent, love of the game, and above all, enormous modesty. That's the formula that the man we know as Dennis is made of (*Ynet Sport*, July 22, 2011).

After a player retires, criticism and the focus on their aging body and advanced age transform into a slew of superlatives, support, and positive media coverage. From an oddity, the player suddenly becomes a star with heroic traits. Nonetheless, Dennis was relegated to public memory, he was "buried" in a glorified manner, is spoken of in the past tense, and the commemoration of his accomplishments became the material for what Hall and Gieben call "memory work" to build the self and its memory. These are the raw materials used in the construction of the player's self-image. Through a retrospective review of the player's achievements, the media establishes a new "self" for the player, one that is consistent with the social order, and these ultimately affect the self-image of the retiring player.

Self-image is a set of beliefs and opinions about oneself, one's values, competencies, and social status. It is one of the main factors that affects a person's behavior. Self-image is dynamic, and is affected

by changes in a person's physical, mental, social, and cognitive condition. Lev (2020) argued that self-image is a product of the athlete's environment, which is the source of the experiences necessary for a person's development; not only to be human but also to feel human, as a connected energized member of the sport community (Lev, 2022). As a significant socialization agent, the media also directly affect the player as a media consumer, and indirectly affect the player's self-image by shaping public opinion. As the findings enable us to discern, the media frame older basketball players as too old to continue playing professional sport by underscoring their age as a central point of discussion. Moreover, the media is the body that sets professional sports within chronological age boundaries and does not necessarily make professional assessments of situations (van Sterkenburg et al., 2010). It affects the audience, and the audience influences the beliefs and opinions of the professional circles that affect players, including their training teams, the audience, and the media. This framing serves to diminish their accomplishments, reducing them to mere statistics that might suggest they no longer belong in their respective sports (Carmack and Lazenby, 2023). In light of this reality, it is unsurprising that both players and fans are influenced by the nature of the media coverage. It is suggested that all of these factors implant in players a specific idea about their abilities, even if this idea conflicts with their own embodied sensations and perceptions, and they play a significant role in their retirement decision.

## Conclusions and summary

Researchers' attention to elite athletes' retirement has typically focused on the athletes themselves and the process they experience on their path to retirement. Studies have also examined the professional, emotional, financial, and other challenges that athletes encounter in adapting to their new situation. The current study focuses on the fans' role and their contribution to the retirement decision. Sports fans are considered a significant factor in modern sports, and this is certainly the case in popular fields of sport where their impact on the sport in general, and specifically on the players, is dramatic.

This study offers a new perspective on the audience's role in shaping athletes' retirement trajectories. Findings point to three main themes: the media's influence on public opinion and public discourse; the audience's effect on athletes; and the athletes' self-image development process through the compliments and taunts directed at them. These themes shed light on a process that has thus far gained limited attention in academic and professional literature. Research on fans' behaviors and impact are typically examined at the team level, with respect to the team's accomplishments. The novelty of the current research is its analysis of the audience's effect on athletes' attitudes and beliefs and how these shape retirement-related decisions. The findings of the current study indicate that the audience does not merely function as a backdrop for athletes' performances, but has the power, at the collective and the individual level, to affect change on and off the court. Significantly, the findings emphasize the challenges that players must confront within an ageist environment. In this context, it becomes evident that the aging process of professional basketball players is, to a great extent, influenced by social constructs.

The current study offers a preliminary focused examination of the phenomenon under investigation. Participants are all elite basketball players with a history in Israel's premier league. It is

therefore important to examine the effect of the audience's conduct on the retirement of players in other fields. Due to cultural and social differences related to the audience's size and conduct, future studies on additional fields or sport and levels of competition can help shed light on the differences and similarities of these cases. Furthermore, attention should also be directed to gender and cultural factors and to how the social and cultural environment in which athletes and the audience function affect the dynamics of their interrelationship.

## Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

## Ethics statement

The study was conducted in accordance with all ethical standards set by Haifa University, Israel, and received approval from the Ethical Committee for Research Studies in Master's Degree programs. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

## Author contributions

AL: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing. OL: Conceptualization, Formal analysis, Writing – original draft, Writing – review & editing. IT: Conceptualization, Formal analysis, Writing – original draft, Writing – review & editing.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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# Sports venue digital twin technology from a spectator virtual visiting perspective

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The purpose of this article is to adopt a customer-centric perspective the and introduce digital twin technology as a solution for mega-sport event management. This conceptual model article focuses on the potentially drastic role of digital twin technology in modern sports events, explaining in detail different aspects of its impact. The main research question is “How (and why) do sports venue digital twin emerging technologies prospectively impact the sports spectators” customer experiences?” It contributes to understanding how and why sports venue digital twins make events more customer-centred by enhancing fan experiences and engagement. Subsequently, it aims to position digital twin technology as an innovative solution for mega-sport event management across various customer experience touchpoints. By examining the intersection of digital twins and sports events from a customer-centric lens, this article will elucidate the intricacies involved in leveraging this emerging technology to transform stakeholder and fan experiences at major sporting events. Finally, we outline and explain the obstacles, challenges, opportunities, and perspectives of digital twin technology at an intersection with sports events from a customer-centric perspective. The use of digital twins potentially enables the creation of hyper-realistic virtual replicas of sports venues, providing immersive and personalized experiences for spectators. This technology allows event organizers to optimize resource allocation, streamline logistics, and improve operational efficiency.

## KEYWORDS

digital twin, sports spectator, sports event, sustainability, virtual visiting, fan engagement, sports venue, digital avatar

## 1. Introduction

Today, organizing mega sports events is seen as one of the societal and economic challenges (1–3) as well as rather controversial due to the complexity of satisfying diverse stakeholder expectations and mitigating negative impacts on host communities (3, 4). Consequently, mega sport events stakeholders are increasingly looking to advanced technologies like digital twins for solutions. For instance, the Paris 2024 Olympic Games plans to utilize a digital twin—an interactive virtual replica of the event. This technology can reduce the need for physical presence and travel, lowering carbon emissions while also providing new avenues for fan engagement. Virtual events accessed through digital twins allow remote fans to immerse themselves in compelling digital environments and interact with other attendees from around the world. As this example shows, digital twins

enable stakeholders to negotiate the uncertainty and difficulties inherent in organizing massive events while promoting sustainability and innovating the fan experience (5). By harnessing emerging tech, stakeholders can work to unlock the marketing and community benefits of mega sports events while minimizing negative impacts and complexity. The turn towards innovative technologies demonstrates the focus on driving progress through digitally-powered solutions to realize the potential of major sporting events.

Technically, the real world can be reflected and re-created digitally. Semeraro et al. (6) argue that digital twin (DT) reflects the real-time operations of the physical system. In the context of events, A digital venue twin can be defined as a virtual interactive representation of an entire venue system. It is supposed to be hyper-realistic and uses real-time data and simulations for a user and user experience (UX). “Hyper-realistic” in the context of a digital twin, such as a digital venue twin, refers to the level of fidelity or realism achieved in the virtual representation of a physical system. Thus, the digital twin is designed to be so incredibly lifelike and detailed that it closely mirrors the real-world system it represents, often to the point where it can be challenging to distinguish between the virtual and physical environments.

Potentially, events’ digital twins bring numerous benefits for all stakeholders (but not limited to): (1) lower maintenance costs, (2) reduced health, safety, and environmental risks, and (3) enhanced strategy to improve system performance, control, and maintenance, among others. For instance, SoFi Stadium in Los Angeles is set to utilize a digital twin to support daily management of the 3.1 million square foot, 70,000 seat venue and enhance the fan experience (7, 8). The virtual model contains information on equipment, conditions, and more to provide a holistic view of optimal stadium utilization. The virtual model of the stadium will allow for personalized wayfinding so fans can easily navigate to their seats. It also gives management data-driven insights to reduce concession stand wait times, optimize traffic flow, and make other improvements to benefit fans. On game days, SoFi Stadium’s digital twin will assist new staff members or people unfamiliar with the massive arena by showing them exactly where they need to be (8). For major events like the Super Bowl that will draw huge crowds, this virtual map will be instrumental in creating a seamless experience for attendees.

To this end, digital twin software technology is capable to create an accurate virtual replica of a physical sporting event as a holistic system to boost productivity and streamline operations, making the event more inclusive, and accessible, both online and offline. Besides the organizers and local residents, spectators are another key event stakeholder (4, 9). While there is extensive discussion on the benefits of athletic training, stadium design, and sustainability in the context of digital twins, less focus has been placed on the customer-centric perspective. The customer-centric perspective is a well-adopted approach in business studies, with research examining event attributes that affect spectators’ experience and satisfaction (10, 11).

The purpose is to adopt a customer-centric perspective and introduce digital twin technology as a solution for mega-sport event management. This article focuses on the potentially drastic

role of digital twin technology in modern sports events, explaining in detail different aspects of its impact. It contributes to understanding how and why sports venue digital twins make events more customer-centred by enhancing fan experiences and engagement. Subsequently, it aims to position digital twin technology as an innovative solution for mega-sport event management across various customer experience touchpoints. By examining the intersection of digital twins and sports events from a customer-centric lens, this article will elucidate the intricacies involved in leveraging this emerging technology to transform stakeholder and fan experiences at major sporting events. Finally, we outline and explain the obstacles, challenges, opportunities, and perspectives of digital twin technology at an intersection with sports events from a customer-centric perspective (12).

The main research question is “How (and why) do sports venue digital twin emerging technologies prospectively impact the sports spectators’ customer experiences?”

Furthermore, it involves a few auxiliary questions:

1. How may we describe the historical and intellectual development of the topic field?
2. What are the major trends and issues in the digital twin technologies market?
3. Who are the stakeholders and what is their interest and involvement with the digital twin technologies’ massive dissemination, notably, in sports event management?
4. What are the opportunities and challenges with these trends and issues?
5. What are the catalysts of sports venue digital twin technologies in environmental issues (technology/ spectating /consumer expectations)?

To this end, we (1) understand and describe the nature, trajectory, and roles of technologies in sports events; (2) outline developing issues and trends that affect the present and future technologies deployment in sports entertainment through the perspective of spectators; (3) appreciate factors that contribute to transforming and enhancing customer-centric perspective in sports mega-events management; (4) recognize the importance of digital twin technologies’ wide dissemination and their effect on event management; (5) understand, explain and describe how sports events are transforming through technology; (6) identify, disclose and introduce the role of the digital twins in future sports events from spectators perspective angle; (7) foresee the future research and development paths and directions. As a conceptual model, this article describes an entity of sports venues’ digital twins’ technology as an object and identifies related constructs and processes (13).

## 2. Theoretical prisms and perspectives

Melnick (14) suggests that various social forces, such as urbanization, individualism, interpersonal competition, technology, and geographical mobility, have led to an increase in the presence of strangers in people’s lives. This, in turn, has

made it more difficult to form close social ties with relatives, friends, neighbors, and colleagues. Consequently, individuals seek to fulfill their sociability needs through alternative means that are less personal, intimate, and private. Accordingly, Melnick (14) proposes that sports spectating has emerged as a significant urban structure where people come together not only for entertainment but also to enhance their social and psychological lives through quasi-intimate relationships that are available within this context. Sports spectating offers individuals an opportunity to engage in social interactions, albeit in a less personal and intimate manner (15, 16).

The changing nature of sociability experiences in sports spectating presents challenges and opportunities for sports managers. To maximize the potential of sports spectating facilities as a “*gemeinschaft*” (a community-oriented social structure), Melnick recommends that sports managers pay attention to the individual and communal aspects of their events. By doing so, they can increase spectator attendance while providing an important public service and spectators’ infrastructure. This theory highlights the impact of social forces on people’s social ties and suggests that sports spectating can serve as a platform for individuals to satisfy their sociability needs. By focusing on the communal and individual aspects of sports events, sports managers can create an environment, including infrastructure and technological equipment that promotes social interactions and enhances the overall spectator experience (5). Digital twin technology of a sporting venue can be seen as a digital infrastructure and technological equipment for sports spectating, including tools for fans’ socializing and communications.

The next theoretical perspective has been brought by Glebova et al. (17) and described as a relocation of sports spectators’ customer experiences (SSCX) as a theoretical prism on sport fans through a customer-centric perspective in the framework of services management. Sports spectatorship is a popular pastime for many people, and in addition to attending live events, fans have various options for consuming sports content through different media platforms (12). These options include fan zones, broadcasts, podcasts, and mobile apps, which allow fans to stay updated on sports news, teams, athletes, events, organizations, and brands (18, 19). Television and radio broadcasts enable fans to watch or listen to live events when they cannot attend them in person. With the widespread availability of smartphones, tablets, internet access, mobile apps, and immersive technologies, sports fans now have the opportunity to have a 24/7 fan experience from anywhere.

Television networks and cable channels offer a wide range of sports programming, providing fans with numerous options for watching their favorite sports at both professional and other levels. The rapid development and diffusion of new technologies have opened up new opportunities for delivering Sports Spectating Customer Experiences (SSCX) and have transformed the forms and locations of these experiences. However, these changes are happening quickly and require further research to understand their impact. Glebova et al. (17) investigate the different locations of SSCX in the current sports fandom environment and they highlight the “physical” and “virtual” locations of SSCX. Physical location refers to the geographical place where a spectator is situated during the spectating

experience, while virtual location refers to the way sports content is accessed. For instance, sports venues are tourism destinations (20). In today’s digital world, the physical location of the fan does not matter in terms of content consumption; what matters is their virtual location. The study emphasizes that fans are “place-shifting” rather than “time-shifting,” as they access sports content from different locations using various devices and platforms. The concept of a “global stadium” (17) describes the aggregate of different types of sports fandom in the current internationalized and digitalized sports landscape. Glebova et al. (17) argue that with the increasing accessibility of digital sports media, fans are no longer confined to physical stadiums but can participate in the global stadium through social networks, online media, and other platforms. Some factors may influence the physical and virtual relocations of SSCX, including information accessibility, increasing mobility and flexibility of fans, the use of new tools for immersive and personalized experiences, and the changing habits of sports spectators.

Following the digital twins in manufacturing and engineering fields (21) and according to the Siemens Glossary, at large, there are three types of digital twins, namely (1) Product, (2) Production, and (3) Performance. The combination and integration of these three types as they evolve together are known as the unified digital “Thread” (22) and it can be seen as a holistic technological process with the perspective to be integrated into event management and spectating experience.

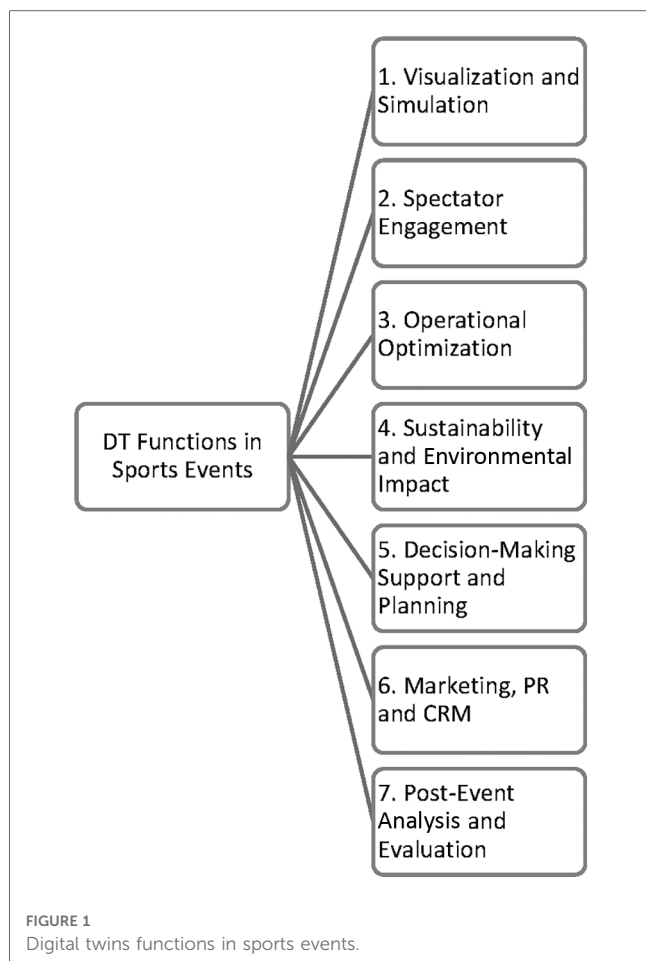
We can assume that with the dissemination and development of digital twin technology the culture of sports spectatorship and fans’ habits will be undergoing significant changes due to the emergence of new forms of sports consumption and the availability of sports content through various channels (23). These changes are leading to relocations of SSCX, both in physical and virtual terms and a combination of factors such as information accessibility, fan mobility, immersive experiences, and evolving fan habits contribute to these relocations. The concept of a global stadium is proposed to encompass the physical and virtual locations of SSCX (17), but its gains new shadows in emergence with digital twins and a digital reflection of the real world in real-time.

### 3. Digital twin technology in sport spectacle

Digital twin technology in sports events serves several functions that contribute to enhancing the overall experience for the stakeholders involved. There are some key functions of digital twin technology in sports events (Figure 1):

#### 3.1. Visualization and simulation

Digital twins provide a virtual and interactive representation of the entire sports venue system, allowing stakeholders to visualize and simulate different aspects of the event (24). This includes simulating crowd flow, seating arrangements, lighting conditions, and other variables that impact the spectator experience (17).



### 3.2. Spectator engagement

Digital twins enable enhanced spectator engagement by offering immersive and interactive experiences (25). Spectators can explore virtual replicas of the venue, access real-time information (17), and interact with various elements of the event (23). This function fosters a more personalized and engaging experience for spectators (12).

### 3.3. Operational optimization

Digital twins assist in optimizing venue operations by leveraging real-time data and simulations. They can provide insights into crowd management (23), facility maintenance, resource allocation (26), and logistical planning (27). By optimizing these aspects, event organizers can improve operational efficiency and streamline processes (28).

### 3.4. Sustainability and environmental impact

Digital twins contribute to sustainability efforts in sports events by reducing environmental impact (29). By creating virtual experiences, digital twins can reduce the need for physical

presence and associated carbon emissions (30). This function aligns with the growing demand for environmentally friendly practices (31, 32) in the sports industry (33).

### 3.5. Decision-making support and planning

Digital twins offer decision-making support tools for event organizers. By providing real-time data and analytics, they help inform decision-making processes (28), such as ticket pricing, security planning, and resource allocation (27). Digital twins enable event organizers to make data-driven decisions that improve planning and execution (12).

### 3.6. Marketing, customer and public relations, and sponsorship opportunities

Digital twins create new marketing and sponsorship opportunities by providing platforms for branding and advertising integration. Sponsors can leverage the digital twin experience to promote their products and engage with spectators in innovative ways (28). This function enhances revenue streams and strengthens sponsor-event and brand-consumer relationships, involving targeting and personalization (12).

### 3.7. Post-event analysis and evaluation

Digital twins capture vast amounts of data during the event, which can be analyzed post-event (34). This function allows event organizers to evaluate the success of the event, identify areas for improvement, and gain insights for future event planning and management, including operational needs and ecological event impact (32).

All these functions collectively contribute to improving the overall spectator experience, operational efficiency, and environmental and sustainability practices in sports events. Digital twin technology enhances various aspects of event management and opens up new possibilities for stakeholder engagement and innovation.

## 4. Digital twins functionality in the framework of sport event management

Digital twin technology in sports spectating serves a range of customer-centric functions that greatly enhance the spectator experience. Through the creation of virtual replicas of sports venues, digital twins offer an immersive viewing experience. Spectators can access these replicas using virtual reality (VR) or augmented reality (AR) technologies, providing them with a sense of being physically present at the event.

One of the key benefits of digital twins is the ability to personalize and customize the spectating experience. Spectators can select their preferred camera angles, access real-time statistics

and information, and tailor their viewing preferences to match their interests. This level of personalization ensures that spectators have a tailored experience that meets their specific needs and preferences. Digital twins also promote interactivity and engagement (35). Spectators can actively participate in the virtual environment by interacting with features such as interactive screens, virtual fan zones, and social media integrations. This fosters a sense of community (as a whole) and engagement among spectators, making the experience more interactive and social.

Real-time information access is another advantage provided by digital twins. Spectators can stay up to date with live scores, player statistics, and event updates through digital interfaces, mobile applications, or connected devices. This real-time information keeps spectators informed and connected, enhancing their overall experience. One of the significant benefits of digital twins is remote accessibility (17). Spectators can engage in sports events from anywhere in the world, overcoming geographical constraints (36). This enables individuals who are unable to physically attend the event to still be part of the spectating experience, broadening the event's reach and inclusivity.

Digital twins also facilitate social interaction and community building among spectators. Virtual platforms and social media integrations enable spectators to connect with fellow fans, share their experiences, and engage in discussions at all stages of event management and marketing (34). The sense of belonging and community enhances the customer-centric environment, making the spectating experience more enjoyable. Furthermore, digital twins offer opportunities for feedback and surveys. Spectators can provide valuable insights and opinions to event organizers, allowing for continuous improvement and enhancement of future events. This gives spectators a voice and allows them to actively contribute to the shaping of the event.

Digital twin technology revolutionizes sports spectating by enhancing personalized, immersive, and interactive experiences (12, 17). By leveraging these customer-centric functions, event organizers can create a highly engaging and tailored environment that caters to the preferences and engagement of the spectators.

The implementation of digital twin technology in the Tour de France and Tour de France Femmes avec Zwift has revolutionized fan engagement and race operations. According to the NTT (37), this hyper-distributed environment, spanning remote regions of France, poses unique challenges in keeping fans engaged and informed across the world. Through data capture from cyclists, race vehicles, and race venues, a digital twin of the entire event is constructed, forming the foundation for the world's largest connected stadium. Real-time data analytics and AI enable the delivery of enhanced, data-driven storytelling to fans, improving their experience with new visualizations and narratives each year. Additionally, the technology facilitates faster, data-driven decision-making for race operations, integrating information that was previously isolated. The introduction of an AI-powered digital human avatar named "Marianne" further enhances interactivity and information dissemination, promising to enrich the overall fan experience. The continuous evolution and advancement of digital twin technology ensure its pivotal role in shaping the future of the Tour de France and similar events.

## 5. Guidelines of DT development and implementation

The historical and intellectual development of digital twin technology in sports event management can be traced back to the convergence of various fields, including virtual reality, simulation, and data analytics (38). The concept of digital twins originated in the field of engineering, where virtual replicas of physical assets were used for design optimization, predictive maintenance, and performance monitoring (27, 28). This concept has since expanded to other industries, including sports.

In the context of sports events, the development of digital twin technology has been driven by advancements in computing power, data analytics, and the wide dissemination of technologies in the sport spectacle field (12, 36). Initially, digital twins were used to model and simulate specific aspects of sports venues, such as crowd flow or lighting conditions (25). However, with the increasing availability of real-time data from IoT devices and the advancement of virtual reality technologies, digital twins now aim to create holistic and hyper-realistic representations of entire venue systems.

The intellectual development of the field involves the exploration of how digital twin technology can be applied to sports event management. Researchers and practitioners have investigated the potential benefits of digital twins in optimizing operations (26, 27), enhancing spectator experiences (12), and improving sustainability in sports events (30).

The digital twin technologies market is witnessing several major trends. First, there is a focus on integrating advanced data analytics and machine learning techniques to extract meaningful insights from the vast amount of real-time data collected by IoT devices in sports venues (37). This enables better decision-making, predictive modeling, and optimization of various aspects, such as crowd management (important for security and control), facility maintenance, and resource allocation (26). Second, there is a growing trend toward immersive experiences through virtual reality and augmented reality technologies. Digital twins allow spectators to virtually explore and interact with sports venues, creating a more engaging and personalized experience. This trend is driven by the increasing demand for unique and interactive fan experiences. Third, there is an emphasis on the integration of digital twin technology with broader event management systems. This includes integrating with ticketing platforms, broadcasting systems, and analytics tools to provide a holistic and interconnected approach to sports event management.

One of the key challenges seems to be ensuring robust data privacy and security measures. As digital twins rely on real-time data collection from various sensors and devices, it is crucial to protect sensitive information and prevent unauthorized access. Furthermore, the complexity of capturing and simulating the dynamic and multidimensional nature of sports events poses a significant technical challenge, including user experience and data management, and visualization.

Various stakeholders play a role in the dissemination of digital twin technologies in sport event management. These stakeholders include sports event organizers, venue operators, technology

providers, sponsors, broadcasters, and spectators. Sports event organizers and venue operators are interested in leveraging digital twin technology to enhance operational efficiency, optimize resource allocation, and improve the overall event experience for spectators. They are motivated by the potential to streamline logistics, reduce costs, and create unique and immersive experiences that attract and retain fans. Technology providers develop and offer digital twin solutions tailored to the sports industry. Their involvement includes designing and implementing digital twin platforms, integrating IoT devices, and providing analytics capabilities to extract insights from the data collected by the digital twins. Their interest lies in offering innovative solutions that address the specific needs of sports event management. Sponsors and broadcasters have a vested interest in digital twin technologies as they provide opportunities for enhanced branding, advertising, and content distribution. Digital twins can offer new avenues for sponsor integration and engagement with spectators, while broadcasters can leverage immersive experiences to provide more engaging and tailored content to viewers. Potentially, an event and venue digital replica has a drastic experiential potential in an immersive environment, including all forms of extended reality. Spectators, the end-users of digital twin experiences, are increasingly interested in personalized and interactive fan experiences. They expect digital twin technologies to provide a more immersive and engaging way to connect with the sports event, access information, and participate in the event remotely.

The trends and issues in digital twin technologies for sports events present both opportunities and challenges. Digital twins enable event organizers to simulate and optimize various aspects of the event, such as seating arrangements, crowd flow, and facility layouts, leading to better event planning and design. Immersive experiences offered by digital twins can create more engaging and personalized interactions for spectators, leading to increased fan satisfaction and loyalty (12). By leveraging real-time data and analytics, digital twins can help optimize resource allocation, maintenance schedules, and facility operations (26), leading to increased efficiency and cost savings. The insights derived from digital twins can inform marketing and business strategies, helping event organizers make data-driven decisions to attract sponsors, improve revenue streams, and enhance the overall fan experience (23). At the same time, on the other hand, integrating complex technologies (12), such as digital twins can be challenging due to compatibility issues, data synchronization, technology acceptance (31), and system interoperability. Collecting and analysing real-time data from IoT devices raises concerns about data privacy and security (12). Safeguarding sensitive information and ensuring compliance with data protection regulations are critical challenges. Furthermore, implementing digital twin technologies can require significant resources and investments in infrastructure, technology platforms, and sophisticatedly skilled personnel with particular technical experience. Scaling the technology to large-scale sports events can be a challenge due to computational and logistical complexities. Also, creating accurate and reliable virtual replicas of sports events is a complex task (25). Probably, ensuring that the digital twin simulations accurately represent real-world dynamics and can be validated against actual event data poses a challenge.

Sports venue digital twin technologies have the potential to address environmental issues in several ways (30). For instance, the convergence of technologies such as IoT, data analytics, and virtual reality enables more efficient resource management and reduces energy consumption in sports venues (25). For example, digital twins can optimize lighting, HVAC systems, and crowd flow to minimize energy usage and environmental impact (32).

Modern consumers (spectators) increasingly value sustainability and expect sports events to align with their environmental consciousness (18). Digital twin technologies can facilitate remote participation and reduce the need for physical travel to events, thereby reducing carbon emissions associated with spectator mobility. Consumers, including sports fans, are becoming more conscious of environmental issues and prefer brands and events that demonstrate environmental responsibility. Sports venues utilizing digital twin technologies to improve sustainability can attract environmentally conscious consumers. Adopting digital twin technologies in sports event management showcases innovation and leadership in sustainability practices (32). By implementing advanced technologies to create more environmentally friendly events, sports organizations can set industry standards and inspire others to follow suit.

These catalysts collectively drive the adoption and implementation of sports venue digital twin technologies to address environmental concerns, improve sustainability practices (39), and align with the expectations of environmentally conscious spectators and consumers.

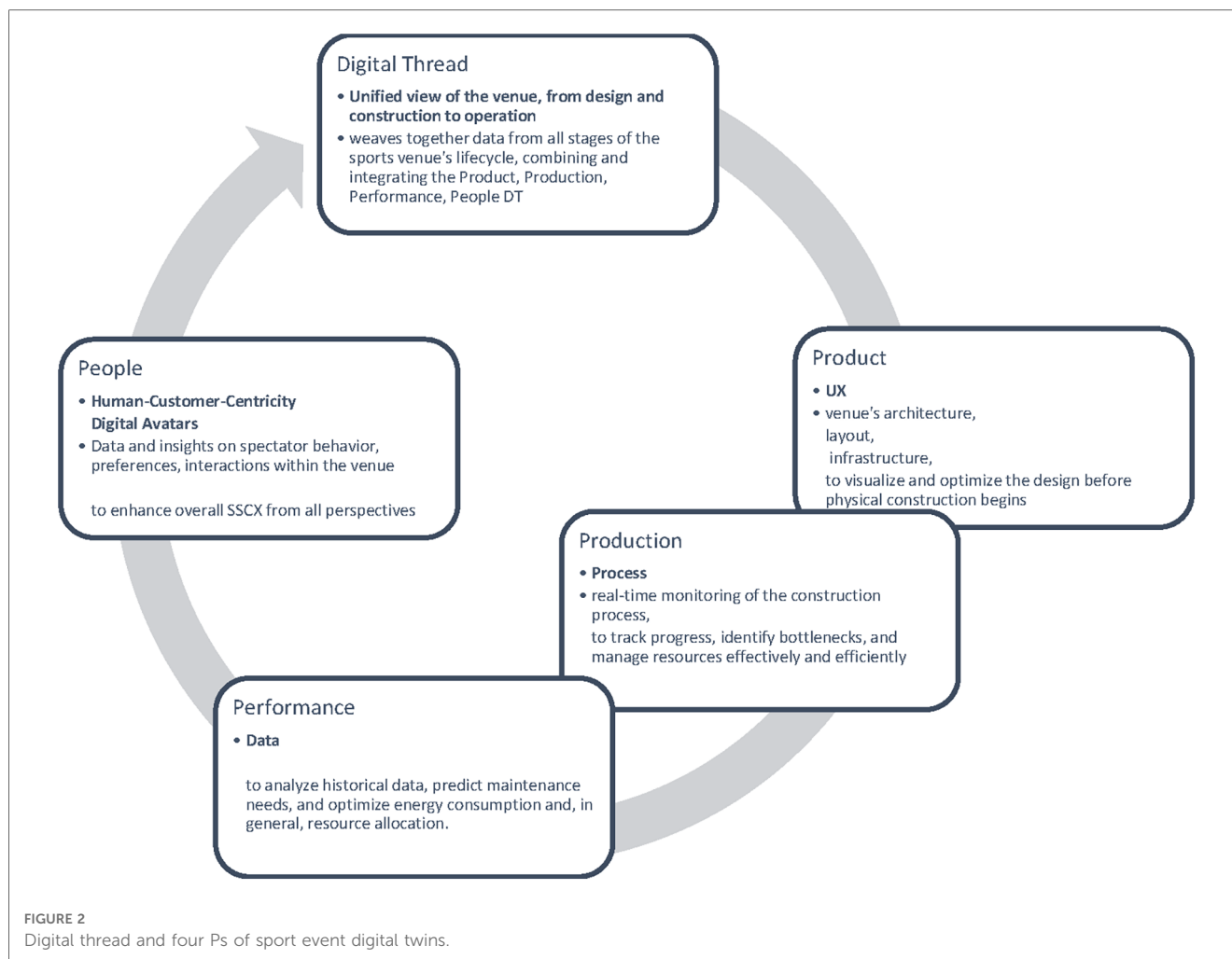
Obviously, the field of digital twin technology in sports event management is still evolving, and further research and practical applications are necessary to fully understand and capitalize on its potential impact and benefits.

## 5.1. Four Ps of digital twins and digital thread

Applying the concept of a digital twin to a sports venue involves leveraging its potential applications based on the three types of digital twins: product, production, and performance (21, 22, 40) in sport event management from a spectator-centric perspective but taking into account a holistic stakeholder approach (Figure 2).

### 5.1.1. Product digital twin

The Product Digital Twin represents the virtual replica of the sports venue during its design and planning stages. It captures detailed information about the venue's architecture, layout, and infrastructure, enabling architects, engineers, and stakeholders to visualize and optimize the design before physical construction begins. By simulating various scenarios, potential issues and inefficiencies can be identified and addressed, leading to cost savings and enhanced functionality. Throughout the lifecycle of the sports venue, the Product Digital Twin serves as a reference for maintenance, refurbishment, and renovation activities, ensuring that changes and updates are aligned with the original design intent.



### 5.1.2. Production digital twin

The Production Digital Twin focuses on the construction phase of the sports venue. It facilitates real-time monitoring of the construction process, enabling project managers to track progress, identify bottlenecks, and manage resources effectively and efficiently. By integrating data from construction equipment, materials, and workers, the Production Digital Twin provides a holistic view of the construction site, allowing for proactive decision-making and timely interventions. Any deviations from the original design can be quickly detected and rectified, reducing delays and cost overruns. Furthermore, the Production Digital Twin aids in ensuring compliance with safety and quality standards during the construction phase.

### 5.1.3. Performance digital twin

Once the sports venue is operational, the Performance Digital Twin comes into play. It continuously gathers data from various sensors and IoT devices installed throughout the venue, capturing real-time information about crowd movement, facility usage, environmental conditions, and equipment performance. This data is used to optimize venue operations, enhance spectator experiences, and improve overall safety and security. The Performance Digital Twin allows venue operators to analyze

historical data, predict maintenance needs, and optimize energy consumption and, in general, resource allocation. Additionally, it assists in delivering personalized experiences to fans, enhancing their engagement and satisfaction.

### 5.1.4. People digital twin: extending the typology and the digital thread

We believe that adding a “People Digital Twin” as the fourth “P” to the DT typology is a valuable extension, especially in the context of a customer-centric approach. The People Digital Twin focuses on capturing and analyzing data related to the spectators and other stakeholders within the sports venue. It gathers data on spectator behavior, preferences, and interactions within the venue. This may include tracking movements, identifying crowd hotspots, monitoring concession stand usage, and analyzing seating preferences. The People Digital Twin is instrumental in enhancing the overall spectator experience. It allows venue operators to gain a deeper understanding of spectator needs and preferences, enabling them to make data-driven decisions to improve services, optimize seating arrangements, and tailor offerings. It can also aid in crowd management, helping to ensure safety and security during events.

Digital twins embrace both spaces and their digital representations, as well as real people and their digital avatars. A digital avatar is defined as a kind of visual presentation of an attendee or visitor (41).

### 5.1.5. Integration of “people” with the three existing Ps

The People Digital Twin is closely integrated with the existing Product, Production, and Performance Digital Twins through the Digital Thread. Data collected from the People Digital Twin can be shared and analyzed in conjunction with data from the other digital twins. This integration allows for a holistic view of the venue that includes both physical and human elements. Insights gained from the People Digital Twin can inform decisions related to design, construction, and operations, ultimately leading to a more customer-centric and satisfying experience.

The inclusion of the People Digital Twin completes a comprehensive approach to sports venue management, where the needs and experiences of spectators and stakeholders are central. Placing “people” as a priority ensures that the sports venue is designed, built, and operated with the aim of delivering exceptional experiences to spectators and other stakeholders.

The four “P”s, when integrated through the Digital Thread, provide a wealth of data that empowers stakeholders to make informed decisions, optimize resources, and continuously improve the venue’s design, construction, and operations. In general, incorporating the People Digital Twin into the theoretical model enriches the customer-centric approach, making it more robust and responsive to the needs and preferences of the people who attend and engage with the sports venue. This extension enhances the model’s ability to create a truly immersive and satisfying experience for all stakeholders.

### 5.1.6. Integration of all Ps through the digital thread

The Digital Thread weaves together data from all stages of the sports venue’s lifecycle, combining and integrating the Product, Production, Performance Digital Twins (40), and, as we suggest the People Digital Twin as well. This comprehensive approach allows stakeholders to have a unified view of the venue, from its design and construction to its operational phase. As the digital twins evolve together, insights gained from one stage can inform and optimize subsequent steps and settings, promoting continuous improvement and efficiency throughout the venue’s lifecycle (33) and event management (42).

The application of a sports venue digital twin offers tremendous benefits by enhancing design, construction, and operational processes. The combination of Product, Production, Performance, and People Digital Twins through the Digital Thread empowers stakeholders with valuable insights and data-driven decision-making, ultimately resulting in a more efficient, sustainable, and engaging sports venue (33).

This approach provides stakeholders with a unified view of the venue, from design and construction to operation. It allows insights gained from one stage to inform and optimize subsequent steps, promoting continuous improvement and efficiency.

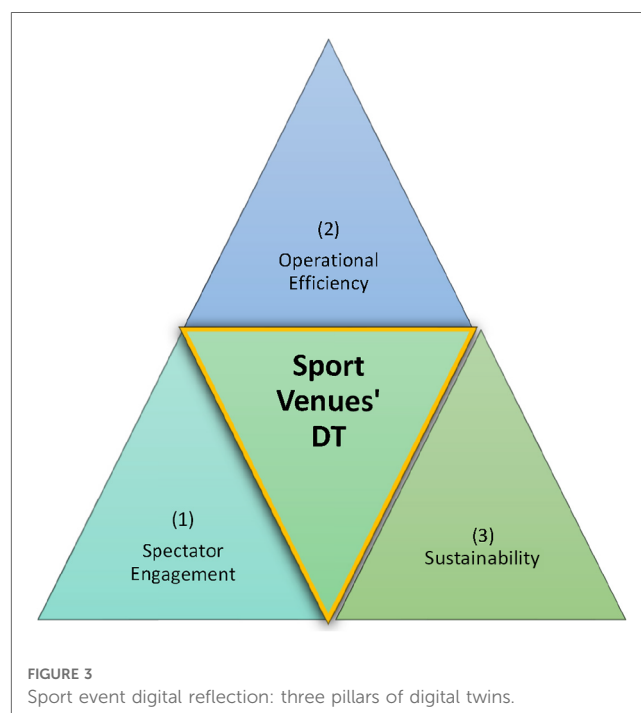
Integrating the three digital twins through the Digital Thread empowers stakeholders with valuable insights and data-driven decision-making, leading to a more *efficient, sustainable, and engaging* sports venue.

## 6. Explaining digital twins in sport event management

### 6.1. Three pillars principles of integration, dissemination, and maintenance of DT

According to Jaakola (13), explaining the evolving phenomenon involves related theoretical constructs and a reliable framework. Based on the information provided, we propose a framework, implying that the integration of digital twin technology in sports event management has the potential to create customer-centric experiences and enhance various aspects of sports events, including three main pillars referring to principles of integration, dissemination, and maintenance of DT: (1) spectator engagement, (2) operational efficiency, and (3) sustainability (Figure 3).

Subsequently, we can propose that by leveraging digital twin technology, sports event organizers can create hyper-realistic virtual replicas of sports venues, enabling immersive and personalized experiences for spectators. This, in turn, enhances fan engagement, satisfaction, and loyalty (25). Furthermore, it lets us suggest that digital twin technology facilitates optimized venue operations by utilizing real-time data and simulations. Event organizers can leverage this technology to improve resource allocation, optimize facility layouts, and streamline logistics, leading to increased operational efficiency and cost savings (23, 26, 39). Also, it highlights the potential of digital



twin technology in addressing environmental issues in sports events (33). Among other dimensions of sustainability (39), by reducing the need for physical attendance and minimizing associated carbon emissions, digital twins may contribute to enhanced environmental sustainability in the sports industry (32), fostering a meaningful consumption philosophy. Thus, the “Event Digital Reflection” (Figure 3) emphasizes the transformative potential of digital twin technology in reshaping the way sports events are organized, maintained, and experienced. It underscores the importance of integrating customer-centric approaches, advanced data analytics, and immersive technologies to create personalized, compelling, and sustainable sports event experiences.

## 6.2. Entry barriers in the digital twin sports arena

Gaining access to a Digital Twin sports event is not as straightforward as simply purchasing a ticket to a traditional game. Fans would need to purchase VR headsets, motion controllers, subscription fees to platforms, and a designated space for movement. These prerequisites add barriers to fans who are not familiar with the digital twins thus creating a divide, even enthusiasts would feel overwhelmed by switching between various virtual spaces where they suffer from cognitive overload. Additionally, those with limited living spaces may find it challenging to meet the spatial demands of a comprehensive Digital Twin experience.

## 6.3. Data privacy digital twin arena

Hosting and Participating in a Digital Twin sports event involves sharing a significant amount of data, some of which may be sensitive or personal. Given the lack of regulation and legality in privacy control and data management in Digital Twin sports environments. At present, the guidelines for data management are still evolving, leaving a set of urgent questions that require attention.

In this context, the concept of consumer-centric organizational learning becomes particularly relevant. Sports organizations must engage in an ongoing, embodied practice of learning that is not only internal and external but also consumer-focused. It is important that the organizer constantly y, a variety of interactive phenomena arise from a direct and engaged participation in the embodied ambiguous life-world experience of the embodied consumer experience to provide a more accessible and safe space for the consumer. The notion of “inter-learning” is crucial here, as organizations need to adapt to these consumer-centric entry barriers, viewing them not merely as technological hurdles but as challenges requiring a consumer-focused approach for resolution.

## 7. Conclusion

The integration of digital twin technology in sports event management presents exciting opportunities for enhancing the

spectator experience, optimizing venue operations, and promoting environmental sustainability. The use of digital twins potentially enables the creation of hyper-realistic virtual replicas of sports venues, providing immersive and personalized experiences for spectators. This technology allows event organizers to optimize resource allocation, streamline logistics, and improve operational efficiency.

Furthermore, digital twin technology offers the potential to address environmental concerns by reducing the need for physical attendance and minimizing associated carbon emissions. By leveraging real-time data and simulations, event organizers can make data-driven decisions that improve sustainability practices in sports events.

## 7.1. Limitations and research directions

In scrutinizing the transformative potential of digital twin technology within the management paradigm of mega sports events, it is imperative to underscore the conspicuous absence of robust empirical evidence and a comprehensive literature base on this nascent subject. The research endeavor, while commendable in its exploration of the purported benefits of digital twins, operates within the confines of a conspicuously sparse body of empirical evidence. This scarcity poses a dual challenge, as it not only accentuates the study’s reliance on theoretical suppositions but also underscores the paucity of substantiated insights into the practical implications and challenges associated with the adoption of digital twin technology in the context of mega sports events.

Furthermore, the primary focus on extolling the theoretical merits of digital twins may inadvertently obscure the pressing need for empirical investigations, thus limiting the depth of scholarly understanding. The absence of empirical underpinnings may impede the nuanced comprehension of the actual dynamics, challenges, and efficacy of digital twin implementation within the unique milieu of mega sports events.

This notable gap in empirical evidence and scholarly discourse underscores the imperative for future research endeavors to bridge this knowledge lacuna. A concerted effort is required to bolster the empirical foundation, allowing for a more substantive and evidence-based elucidation of the implications, challenges, and effectiveness of digital twin technology in mega sports event management. The scholarly community is urged to contribute empirical studies that scrutinize the practical applications and outcomes of digital twin implementation in diverse mega sports event contexts, thereby enriching the current discourse and paving the way for a more robust understanding of the subject matter.

## 7.2. Theoretical and practical implications

However, it is important to acknowledge the challenges and complexities associated with implementing digital twin technology, such as data privacy and security, integration of diverse technologies, and ensuring the accuracy and reliability of virtual representations. Overcoming these challenges will require

further research, technological advancements, and collaboration among stakeholders.

The adoption development and dissemination of digital twin technology in sports event management holds great promise for creating customer-centric experiences (SSCX), optimizing operations, and advancing sustainability. Continued exploration and implementation of this technology can lead to innovative and transformative changes in the way sports events are organized, experienced, and managed.

This technological milieu, furthermore, holds promise in mitigating environmental concerns by attenuating the imperative for physical attendance, thereby minimizing associated carbon emissions through the judicious application of real-time data and simulations. Nevertheless, the assimilation of digital twin technology is not bereft of formidable challenges, prominently encompassing concerns of data privacy, security imperatives, seamless integration of diverse technological frameworks, and the assurance of veracity in virtual representations. A requisite acknowledgment of these challenges is imperative, concomitant with an assiduous commitment to further research endeavors, technological advancements, and collaborative endeavors among pertinent stakeholders.

Theoretical and practical implications emanate from this technological integration. User-centric interfaces for virtual replicas necessitate careful design considerations, as do systems for personalized all types of contents delivery. Equally pivotal is the instigation of comprehensive training programs for venue personnel, ensuring adept utilization of digital twin data. Concurrently, investment in artificial intelligence algorithms, deployment of Internet of Things devices for real-time monitoring, and fortification of cybersecurity measures are indispensable facets of practical implementation (43).

The standardization of industry protocols, fostering collaborative frameworks among technology providers, and a stringent commitment to the accuracy and reliability of digital twin representations are pivotal endeavors. Beyond these, stakeholder collaboration, innovation in user experiences, and sustained research and development initiatives emerge as fundamental contributors to the transformative potential of digital twin technology within the realm of sports event

management. These measures collectively engender a theoretical and practical landscape ripe for innovative and sustainable transformations in the orchestration, experience, and administration of sports events.

## Author contributions

EG: Conceptualization, Methodology, Project administration, Resources, Visualization, Writing – original draft, Writing – review & editing. RB: Conceptualization, Funding acquisition, Resources, Writing – review & editing. YS: Conceptualization, Resources, Visualization, Writing – original draft, Writing – review & editing. MP: Conceptualization, Project administration, Resources, Supervision, Writing – original draft. JH: Project administration, Supervision, Writing – review & editing.

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# "I don't watch that anymore": an analysis of online comments by German soccer fans on their relationship to their favored clubs

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**Introduction:** Soccer fans are important stakeholders of their favored clubs; yet, although there is manifold literature on this subject, there are still open questions concerning supporters' relationship and loyalty to those clubs, such as potential fan exits, where supporters turn away from their preferred team. Existing literature describes diverging evidence as to whether an exit is possible and whether fans' loyalty prevents that response. Against this background, it is important to examine how the relationship between fans and soccer clubs presents itself from the fans' perspective. This study focuses on German soccer fans because an increasing number of media reports note problems for the fans in this regard, reporting eroded loyalty, increasing alienation, or turning away.

**Methods:** By means of a qualitative and explorative approach (thematic analysis), this study analyzes online fan comments associated with the mentioned reports. A purposive sample of 17 media reports with 10,902 associated comments written/published between 2020 and 2023 was included in this study.

**Results:** The thematic analysis show that fans reflect their relationship to favored clubs in three ways: negative changes in the emotional relationship, negative behavioral changes in the relationship, and no or positive changes in the relationship. A wide continuum of negative emotional and behavioral changes is identified, ranging from a deterioration of the inner bond with the favored club to different levels of ceasing soccer-related consumption. As explanations for the (potential) dynamics and changes in the relationship, fans reflect a broad and diverse field of developments in the context of German soccer. The differentiated developments are systemized within four categories: commercialization, governance, attractiveness, and the COVID-19 pandemic.

**Discussion:** The results are discussed and contextualized referring to the Exit-Voice-Loyalty-Framework and thematically relevant literature. Particularly far-reaching is the finding that there are indeed fans in the field of soccer who are capable of permanently abandoning (exiting) formerly supported clubs. The article concludes with theoretical and managerial implications emerging from the results, as well as limitations and areas of interest for further research.

## KEYWORDS

exit, loyalty, supporter, team, football, fandom

# 1 Introduction

As in other economic sectors, loyalty and customer retention are of central importance in the sports industry for generating profit and thus success (Kucharska et al., 2020). Fans invest time, money, and passion in their relationship with their team or athlete, which makes them essential for the future of sports as one of the most important stakeholders (Senaux, 2008; Winell et al., 2023). This is all the more true for fans that are not merely consumers but actively contribute to the value and quality of sporting events as *value co-creators* (Kucharska et al., 2020; Woratschek et al., 2020).

One of the most popular sports worldwide is soccer, known for the deep attachment between fans and teams. Metaphorically, soccer fans have also been referred to as the “*bread and butter*” (Merkel, 2012, p. 364), while their importance is also emphasized by the generally known statement “*football [i.e., soccer] without fans is nothing*” (Bond et al., 2022, p. 116). Soccer also plays a special role among fans in Germany, where no other sport exerts such a fascination and clearly dominates the popularity scale compared to sports such as basketball, ice hockey, or handball (Huber, 2022). In the 2018/19 season (and thus before the effects of the COVID-19 pandemic), Germany’s top two men’s divisions generated EUR 4.8 billion in revenue, with almost 19 million tickets sold (DFL Deutsche Fußball Liga, 2020). A current market and advertising media analysis assumes that around 46 million people in Germany can be described as soccer fans due to a general interest, which would correspond to more than half of the total population (Statista Research Department, 2023).

Despite this importance, there are growing media reports addressing problems for fans in the context of German soccer. More specifically, these reports identify fans’ erosion of loyalty, increasing alienation, or turning away. Furthermore, this fan alienation is also reported in other European countries, including the United Kingdom (Giulianotti, 2005; Morrow, 2023), Poland (Choluj et al., 2020), or Norway (Hognestad, 2015), a spread that emphasizes the relevance of researching the extent and consequences of soccer fans’ alienation. One assumption is that certain developments in soccer endanger the relationship between fans and their clubs or even completely dissolve this connection (Kiernan, 2017). Other studies (e.g., Tamir, 2022) emphasize that true fans never turn away from their club and remain loyal, though their fandom is subject to change. This contrary description of the (potentially) dissolving relationship between fans and clubs calls for further investigation, especially for German soccer.

Interaction between fans and teams, as well as among fans, is no longer limited to matchday. Nowadays, fans interact in manifold ways online, where they express opinions and discuss problems. For this reason, their online participation remains a rich and necessary source of evidence (Gibbons and Dixon, 2010; Cable et al., 2022; Woods and Ludvigsen, 2022; Petersen-Wagner and Ludvigsen, 2023). The aforementioned media reports concerning German soccer are commented on by fans online, which affords an opportunity to investigate how fans assess and reflect on their relationship with soccer clubs. This study is therefore guided by the following research question: How does the relationship between German fans and soccer clubs present itself from the fans’ perspective? In answering this question, this study will particularly focus on which developments in the context of German soccer led to fans’ dissent and dissatisfaction, as well as to their impaired loyalty and turning away. The use of a qualitative and explorative approach also allows for the elaboration of

a variety of (potential) dynamics and changes in fans’ relationships, as reported in the comments.

This article is structured as follows: first, the theoretical background with the underlying *Exit-Voice-Loyalty-Framework* (Hirschman, 1970) is discussed and explained with reference to soccer fans and their relationship to their favored clubs. In the subsequent literature review, thematically relevant study results are cited. This is followed by a description of the methodological approach, including an explanation of the selection of relevant media reports and fan comments and an outline of the qualitative-explorative procedure within the thematic analysis. The findings are then discussed, focusing on the relationship between fans and clubs in response to the research question. The results show that fans reflect their relationship to favored clubs in three ways: negative changes in the emotional relationship, negative behavioral changes in the relationship, and no or positive changes in the relationship. Furthermore, fans’ comments reflect four different developments in the context of German soccer: commercialization, attractiveness, governance, and the COVID-19 pandemic. The article contributes to existing knowledge by concluding with theoretical and managerial implications emerging from the results. Furthermore, limitations and areas of interest for further research are identified.

# 2 Theoretical background

This study is based on Hirschman’s *Exit-Voice-Loyalty-Framework*, which is, according to Kiernan (2017, p. 880), a “particularly useful framework to apply to the ebb and flow of modern football [soccer]” and has therefore repeatedly found its way into the research of soccer and its supporters (e.g., Nikolychuk and Sturgess, 2007; Margalit, 2008; Healy and McDonagh, 2013; Hoegele et al., 2014; Kiernan, 2017). Within the framework, *exit* and *voice* are the two basic response options to members of an organization or customers of a company in the event of dissatisfaction. *Exit* or “cut and run” (Kiernan, 2017, p. 884) can be used to describe “all forms of ceasing involvement” (Hoegele et al., 2014, p. 300), whereby members may leave an organization, or customers may stop purchasing a company’s products (Hirschman, 1970). *Voice* or “stay and fight” (Kiernan, 2017, p. 884), on the other hand, refers to “any attempt to change a disagreeable situation [...] with the intention of forcing a change in management practices” (Nikolychuk and Sturgess, 2007, p. 843). For example, members/customers can address the management of an organization/company with complaints or initiate protest action (Hirschman, 1970). The factor of *loyalty* is described by Hirschman (1970, p. 77) as a “special attachment” of members/customers to an organization/company and moderates or intervenes in this context between the two basic response options. Loyalty prevents an exit, or at least delays it, and gives members/customers the opportunity to articulate voice more strongly (Hoegele et al., 2014; Kiernan, 2017) or, as Nikolychuk and Sturgess (2007, p. 843) put it, “the likelihood of voice increases with the degree of loyalty because these feelings [...] act as a barrier to exit, especially when substitution is limited.”

Fans of soccer clubs are generally known as consumers who have only limited substitution options. In this context, Bühler (2006, p. 30) also speaks of “*captive consumers* in a *captive market*, which means that they do not really have a choice,” clarifying that “traditional *die-hard supporters* would never change the soccer club just because

another club offers cheaper tickets or merchandising articles.” Simplistically, it is generally assumed that fan demand is largely inelastic and that fans support their sport *evermore* (Tapp, 2004; Dixon, 2014; Watkins and Cox, 2021). This is due to a high degree of fan loyalty, which is also the reason why fans are more likely to prefer the voice over the exit response in the event of dissatisfaction. For example, soccer fans often vocally express dissatisfaction with the leadership or performance of favored teams but do not limit their spending toward the club to the same extent (Bühler, 2006; Dixon, 2014; Roose and Schäfer, 2017).

Loyalty is a term used to describe the connection or relationship between fans and the teams they favor (Fillis and Mackay, 2014). Loyalty itself cannot be understood as a one-sided concept but is composed of both an attitudinal and behavioral dimension (Dick and Basu, 1994; Chaudhuri and Holbrook, 2001). The attitudinal dimension of loyalty basically characterizes the inner bond or emotional affiliation of fans to their team and is also captured in the sports context by the term *psychological commitment* (Bauer et al., 2005, 2008). Following Bauer et al. (2008, p. 207), this psychological commitment is present to a high degree among fans “if they feel a deep inner attachment to their favorite team and if their commitment is persistent over time and resistant to criticism.” The behavioral dimension of loyalty is basically expressed in various forms of fan behavior in the team sport context, such as “attending the favorite club’s games live in the stadium, watching the favorite club’s games on television, consuming other club-related media, purchasing club merchandize, wearing the colors or logo of the favorite club, [...] trying to convince others that the favorite club should be supported” (Bauer et al., 2008, pp. 207–208), and “participating in discussions about the favorite club” (Bauer et al., 2005, p. 11).

Furthermore, the behavioral dimension is supplemented by an intentional component, which, corresponding to the listed forms of past fan behavior, entails fans’ ongoing or future intention to behave positively (Bauer et al., 2008). Neither a low or a high level of psychological commitment necessarily has to manifest itself in a correspondingly low or high level of behavioral loyalty, nor must there be a correspondingly obvious connection between the two dimensions of loyalty. Dick and Basu (1994) also differentiate between *spurious* (low relative attitude and high repeat patronage) and *latent* loyalty (high relative attitude and low repeat patronage). For example, soccer spectators may regularly watch matches in the stadium because they have been given a season ticket, not because they feel a high level of psychological commitment to the team (Bauer et al., 2008). Conversely, a soccer spectator may feel a high degree of emotional affiliation to the team but refrain from going to the stadium regularly because of a lack of income or available company (Dick and Basu, 1994). Furthermore, the loyalty fans show to their favorite teams does not necessarily stand alone. The relationship might be dependent on other *points of attachment*; for example, the connection that fans have to the specific sport in general, level, player(s), coach, or community of fans (Kwon et al., 2005; Yoshida et al., 2015).

### 3 Literature review

Different studies have raised the fundamental question of the extent to which soccer fans are generally able to exit their favored clubs. In his study of soccer fans in Israel, Tamir (2022, p. 338) speaks

of a “natural life cycle of sports fans” and argues that fandom is equally subject to change due to the changing circumstances of the respective fan, but at no time is it terminated: “Sports fandom passes through several stages that vary in the strength of the fan’s connection and commitment to his team. Understanding the cyclic nature of sport fandom over fans’ lives importantly offers a better understanding of the dynamics between fans and their teams” (p. 349).

Researching German soccer fans, Königstorfer and Uhrich (2009) and Königstorfer et al. (2010) found that fans’ behavioral loyalty is unaffected when facing the negative sporting scenario of relegation, instead the relationship might sometimes even be strengthened. Thus, their results “support the notion that highly committed fans and their clubs are strongly bound to each other [...]. Indeed, loyal fans often remain behaviorally loyal to their club throughout their life” (Königstorfer et al., 2010, p. 664). Studies of soccer fans from the United Kingdom provide similar results, with Healy and McDonagh (2013) arguing that fans can “exit from the market” (p. 1534); that is, they can discontinue club-related consumption to varying degrees. However, changing clubs is not an option because “fans refer to themselves as extremely loyal and unable to switch clubs” (p. 1533).

Tinson et al. (2023) conclude that fans may see the value of their fandom diminished in various ways—for example, because high costs prevent game attendance—but are able to remain loyal to their team by compensating for this diminishment. Tinson et al. (2023) also stress that “there were no fans in our sample who had entirely exited the market. Although fans reduced their nature and level of participation in the market, they were reluctant to disassociate completely from their team. This supports the notion that fans can compensate perceptions of value being disrupted by trading-off negative experiences with ones that allow value to be recovered” (p. 421). In some contrast to this, Tapp (2004) points out that the loyalty of supporters cannot be relied upon in principle, as it is or can be influenced by a variety of different factors, as “sports supporter loyalties are more complex than is suggested by the simple conventional wisdom that all fans will ‘support you evermore’” (p. 212). A fan exit seems therefore possible.

Like Tapp, Watkins and Cox (2021) also point out the complexity and changeability of the relationship between fans and their favorite soccer clubs, but they deny the possibility of a complete exit. Using the case of fans who support a professional and a non-league soccer team in parallel, they argue that this “polygamous fandom” (p. 716) is also due to disillusionment and dissatisfaction with professional soccer. The relationship of fans with their professional team is characterized by an erosion, but is maintained nonetheless. The authors note in this regard that it is questionable whether the consumption of professional soccer can be ceased altogether. At the very least, the examined fans show “limits of loyalty to professional football [soccer] teams” (p. 716) by supporting a non-league team.

A *continuitive exit* of fans from their favored clubs is observable in the case of so-called “post-consumer clubs” (Brandt and Kurscheidt, 2022, p. 4), with FC United of Manchester probably the most prominent example (Nikolychuk and Sturges, 2007; Kiernan, 2017). In the context of German soccer, the example HFC Falke could be cited as a “club beyond commercialization” (Brandt and Kurscheidt, 2022, p. 2). HFC Falke was founded in 2014 by former fans of Hamburger SV as a reaction to the outsourcing of the professional teams. Fans’ founding of such new clubs is born out of dissatisfaction, giving them a place to go to and maintaining the community.

Furthermore, these clubs still have a certain connection to the respective parent clubs by following, sometimes more sometimes less strongly, their history and tradition (Brandt and Kurscheidt, 2022).

Another set of literature discusses reasons for and the dynamics of fans' dissatisfaction, which potentially cause an exit. With specific regard to the relationship of German soccer fans to their sport, studies that address developments in soccer or influencing factors concerning exit continue to be informative. Merkel (2012) gives an overview of fan reactions and resistance to developments in the context of increasing commercialization, although commercialization in German soccer is assessed as moderate compared to other European leagues. In general, commercialization subsumes developments that focus on the generation of profit and revenues, including increasing prices or new ways of selling spectators' interest to third parties. It is also a term used to describe the prevalence of increasingly market-oriented behavior; for example, transferring players or managers like assets and paying horrendous sums for this without considering the (local) fan community, in turn leading to a social and economic alienation between players and fans (Walsh and Giulianotti, 2001; Merkel, 2012; Brandt and Kurscheidt, 2022).

In addition to growing commercialization, a study on fan activism in Germany concludes that developments related to governance are the most common reason for activism (Brandt et al., 2023). Fans' activism, as well as their opportunities to influence and participate in decision-making, are thereby furthered by the prescribed democratic structure of German soccer clubs in the form of so-called *Vereine* (Merkel, 2012; Brandt et al., 2023), where clubs, in principle, are run by their members. Even in the case of professional soccer teams being outsourced to corporations, the so-called *50 + 1 rule* normally only allows the parent club to hold a majority stake (50 + 1% of the voting rights) in the shareholders' assembly of the spin-off corporation. The 50 + 1 rule thus safeguards the leadership role of clubs and their members while limiting the influence of investors and preventing oligarchization (Bauers et al., 2020).

Nevertheless, there are approved exceptions to the 50 + 1 rule; currently this includes the clubs Bayer Leverkusen, VfL Wolfsburg, and TSG 1899 Hoffenheim (Adam et al., 2020), though it has been announced that the latter is to return to the rule (Guinin, 2023). Due to existing economic and legal interdependencies and dependencies, further clubs such as RB Leipzig or FC Augsburg are classified as circumventing the rule (Adam et al., 2020). Due to the circumventions and exceptions, Adam et al. (2020) suspect a latent repeal of the rule and a reduction of traditional opportunities for member participation in German soccer. Members' ability to influence relevant decisions is also considerably weakened by this. In the restriction of these options, which can be understood as expressions of the voice option (Hirschman, 1970; Bauers et al., 2023), Adam et al. (2020) also see the risk of soccer club supporters exiting. In line with this and based on a survey of members and fans of soccer clubs, Bauers et al. (2020) found that the majority of questioned persons are in favor of retaining the 50 + 1 rule. Advocacy is essentially related to the preservation of influence, the exclusion of multi-club ownerships, and the avoidance of increasing commercialization tendencies.

On the part of fans, another presumed point of criticism concerning the Bundesliga (the highest division in German soccer) is the decline in *competitive balance* or *competitive intensity*, which is attested to in studies by Ramchandani et al. (2018) and Wagner et al. (2020). This process can be seen directly in the dominance of the club FC Bayern München, which has won eleven championships in a row since the

2012/13 season. Furthermore, among recent technical developments, the most significant innovation in the context of German professional soccer has been the introduction of the Video Assistant Referee (VAR). Based on a survey, Schwab et al. (2023) argue that fans rate the VAR less positively or express dissatisfaction in this regard. Among other things, Schwab et al. (2023) assume that this is due to a lack of transparency in the review of disputed game scenes, which are shown to the referee but not to fans in the stadium. As a result, decisions made by the referee can be interpreted as wrong by the fans.

Another factor influencing German soccer was the COVID-19 pandemic, during which fans were only allowed into the stadium in reduced numbers or not at all (with matches played behind closed doors). Questioning fans of a Bundesliga club, Wilkesmann (2022) examined the factors that stand in their way of a return to the stadium after the end of the pandemic. The study concludes that the pandemic itself and the fear of infection, as well as the overall development of professional soccer (especially in the face of increasing commercialization), but also the feeling of belonging to the club before and during the pandemic all have only a marginal influence on supporters' intention to return. More specifically, 83.2% of the supporters surveyed said they would go to the stadium again, with Wilkesmann arguing that supporters are very loyal and strongly socialized with the club's culture. This might be a possible explanation why fans do not significantly change their behavior.

In summary, the literature review reveals contrary descriptions of the relationship between fans and their favored soccer clubs. Studies from Healy and McDonagh (2013), Tamir (2022), and Tinson et al. (2023) could not observe a (completely) dissolving relationship and emphasize the loyalty of fans to clubs in this regard. Tapp (2004) points out that the loyalty of supporters cannot be relied upon in principle because of its complexity and Watkins and Cox's (2021) study shows that soccer fans are indeed capable of substituting their favored club, at least to a certain degree. Under certain conditions some fans might even go a step further, abandoning their formerly favored club completely (i.e., exiting) and founding their own clubs, as the examples FC United of Manchester and HFC Falke show. These diverging findings call for a further investigation of the relationship between fans and clubs.

The literature review also shows that there are several developments that might have the potential to endanger or even dissolve fans' relationship with their clubs in Germany. However, focused research is missing and existing assumptions in this regard cannot be confirmed beyond doubt. Given the above-identified research gaps and this study's explorative research question (*How does the relationship between German fans and soccer clubs present itself from the fans' perspective?*), the following section pursues a qualitative approach. The focus thereby lies on the developments in the context of German soccer that lead to dissatisfaction and dissent on the part of fans, as well as to their impaired loyalty and turning away.

## 4 Materials and methods

Several studies have answered the call to use the online behavior and participation of soccer fans as research data. These studies have shown the benefits of using the variety of content that is available online (tweets, posts, comments on YouTube videos, Facebook group discussions, contributions to online message platform, etc.) as it comes without a need to engage with or influence participants via the

TABLE 1 Included media reports and fan comments.

Translated title	Publication date	Number of extracted comments	Number of relevant comments
<b>Media reports from social media</b>			
Q1: Is soccer as we know it dying?	16.11.2020	285	22
Q2: Erosion of fan loyalty in professional soccer	04.02.2022	1.195	190
Q3: Clapping, paying, silence: that's why your soccer DIES	23.02.2022	1.890	160
Q4: Supercup abroad: is this still soccer or can it go away?	02.03.2022	1.031	6
Q5: GamerBrother reacts to: that's why your soccer DIES	04.03.2022	314	14
Q6: Death Star of the South: is this still soccer or can it go away?	13.05.2022	1.596	24
Q7: The truth about German soccer!	20.11.2022	1.199	152
Q8: Bundesliga 2023: is this still soccer or can it go away?	17.03.2023	1.886	63
Q 9: GamerBrother reacts on Bundesliga 2023: is this still soccer or can it go away? 🤖	19.03.2023	539	23
<b>Media reports from sport-related homepages</b>			
Q10: VfB ultra Clemens Knödler interviewed: "at the moment we are experiencing a definitive betrayal of soccer"	16.05.2020	196	4
Q11: Alienation from soccer: Andreas Rettig contradicts Peter Peters	28.12.2020	21	0
Q 12: Column - The problems of German soccer: financial holes, fan alienation, leadership vacuum	10.09.2021	93	6
Q13: Fan representative Helen Breit on the development of the Bundesliga: "even FC Bayern does not have six votes"	21.09.2021	138	5
Q14: Bundesliga: spectator decline in Corona times - fan researcher explains "alienation"	09.11.2021	19	1
<b>Media reports from classic newspapers</b>			
Q15: The Bavarian Queen	24.05.2021	334	20
Q16: I do not love you anymore, soccer	23.04.2022	105	20
<b>Fan forum discussing an included media report from social media</b>			
Q17: Erosion of fan loyalty in professional soccer	04.02.2022	61	1
Total		10.902	711

researchers' presence (Woods and Ludvigsen, 2022; Hansen et al., 2023). Another benefit is the wide range of general or specific topics that could be examined through fans, as shown by studies on club ownership (Levental et al., 2016), VAR (Petersen-Wagner and Ludvigsen, 2023), corruption (Hie et al., 2023), nationalism (Tamir et al., 2016), and the allegiance to and interest in American Major League Soccer (Wilson, 2007).

Using a qualitative and explorative approach this study aims to gain insights into the relationship between German fans and their favored clubs. As the research was inspired by media reports considering this relationship, it was appropriate to use the online fan comments on these reports as data. The selection of media reports follows the approach of *purposive sampling* to gain a "better matching of the sample to the aims and objectives of the research, thus improving the rigor of the study and trustworthiness of the data and results" (Campbell et al., 2020, p. 653).

Only reports of *thematic relevance* published between January 2020 and March 2023 and in the German language were included in the study. These are reports that address problems in the relationship between fans and German soccer that potentially could result in an exit. Another selection criterion was the *free and public accessibility* of the reports. This means that it is possible for everyone to view and comment on the reports and associated comments online, free of charge. Furthermore, reports in different *formats* were included in the

study to represent a *heterogeneous sample* of commenting fans if possible. The sample includes reports published online via social media, on sports-related homepages, by classic newspapers, and one fan forum discussion. Finally, only those reports were selected that received a certain amount of *attention and resonance* from the fans; that is, those with at least 10 comments. The final sample consists of 17 different media reports (Table 1) with 10,902 associated fan comments.

The comments, including *nested comments* (i.e., comments on comments), were extracted and transferred to *Excel* files in May/June 2023. This was done automatically by using the tool [exportcomments.com](https://exportcomments.com). Where automatic extraction was not possible, comments were extracted manually. The sample of 10,902 comments was then divided between the two first authors to independently examine the comments' relevance to the formulated research question. The findings were then jointly evaluated and resulted in iteratively developed criteria for identifying relevant comments.

To retain the focus on the research question (*How does the relationship between German fans and soccer clubs present itself from the fans' perspective?*) and to uncover why German fans reflect on their relationship to soccer clubs the way they do, only those comments were included in which fans reflect on their own relationship to their clubs and on *developments* in soccer. That is, comments reflecting none or only one of these issues were excluded. Duplicates, ironic comments, unclear

comments, or comments related to (inter-)national teams were also excluded. Based on the criteria developed, the complete sample of comments was subsequently checked again, with 711 relevant comments transferred for thematic analysis.

Comparable to the studies of Cable et al. (2022), Hansen et al. (2023), Petersen-Wagner and Ludvigsen (2023), and Seijbel et al. (2023), the methodological approach of thematic analysis was selected for analyzing the data. More specifically, here we followed the approach of Braun and Clarke (2006). Relevant comments were coded *inductive*, meaning determined by the data itself. This does not obviate the need to state theoretical assumptions clearly and transparently (Braun and Clarke, 2006).

The sample of 711 comments was again divided between the two first authors, initially coded, and searched for potential themes. In what Braun and Clarke (2006, p. 82) have termed an “ongoing reflexive dialog” between the two first authors, the respective findings were brought together, coding for the entire sample was reviewed and revised, and the final themes were defined and named. This iterative approach reflects the fact that thematic analysis is not a non-linear process “of simply moving from one phase to the next,” but rather is a “more recursive process, where movement is back and forth as needed, throughout the phases” (Braun and Clarke, 2006, p. 86). The software MAXQDA 2022, a program designed for computer-assisted qualitative analysis, was used when analyzing the comments.

Finally, the use of fan comments requires some ethical remarks as internet-based research comes with challenges regarding the informed consent of participants and the boundaries between public and private spaces (Convery and Cox, 2012). The fact that the comments are free and publicly accessible does not mean that fans can nevertheless perceive their online participation as private (Convery and Cox, 2012; Wegner et al., 2020), nor that they agree to their use in an academic context. This study draws on the ethical considerations of Convery and Cox (2012), which points out that in open-access forums, such as newsgroups and bulletin boards, “informed consent may not always be required” as “the internet is usually considered a public place and public behavior does not necessarily require informed consent” (p. 54).

To fully address any ethical concerns, this study further follows the procedure employed in comparable studies (e.g., Wegner et al., 2020; Hansen et al., 2023; Seijbel et al., 2023). Thus, the cited comments were subject to a complete de-identification, thereby excluding fans’ plain names or pseudonyms. In addition, comments were not cited in their entirety and were translated from German into English to preclude backtracking using online search engines. During translation, care was taken not to change the original content of the comments. In summary, ethical concerns in the context of this study could be eliminated by this procedure.

## 5 Results and discussion

In line with the research question, the focus in this section lies on the relationship between fans and their clubs as a point of attachment. Nevertheless, results concerning fans assessing their relationship to soccer in general, as another point of attachment (Kwon et al., 2005; Yoshida et al., 2015), are also discussed when they provide further insights. The following results section has been structured on the categorization of two higher themes, with associated lower themes.

The first higher theme entails the fans’ perspectives on their relationship to their favored soccer clubs with regard to the research question. To fully understand these relationships, it is necessary to consider both the attitudinal and the behavioral dimension of the concept of fan loyalty and the fact that there might not necessarily be an obvious and logically comprehensible connection between them (Bauer et al., 2008). For that, fans reporting negative changes in the relationship to their favored soccer clubs are discussed within two separate sections that cover these two dimensions. The changes within both of these dimensions are discussed with regard to fans’ exit. Due to the fact that some fans reported no changes in the relationship at all, or even positive changes, these comments are discussed within another section.

In this regard, the second higher theme contains the fans’ perspective on developments in the context of German soccer. The developments that the fans mention are to be understood as explanations for the (potential) dynamics and changes in the relationship. Within this theme, the underlying research question is discussed in more detail (i.e., *Why do German fans reflect on their relationship to soccer clubs the way they do?*). The developments that the fans assess in the context of German soccer therefore represent the second set of categories: commercialization, governance, attractiveness, and the COVID-19 pandemic.

Table 2 provides an overview of the categorization, which will be explained below in more detail and with examples from the sample of fan comments. If fans provide further socio-demographic data in their comments (age of the fan; name of their favorite soccer club), this information was added to the specific quotes.

### 5.1 Fans’ perspective on their relationship to their favored soccer club

#### 5.1.1 Negative changes of the emotional relationship

In manifold comments, fans describe a negative emotional change in their relationship with their favorite club. Their emotional affiliation or inner bond with the club (Bauer et al., 2005, 2008) has deteriorated. An example is the following quote:

*I realize more and more often, that the result actually does not matter to me. And if we are trailing behind, for example, [it] no longer even triggers great emotion. Somehow that’s really shitty.*  
(Q1: 15 – fan Eintracht Frankfurt)

Fans see themselves as emotionally affected by their favorite team’s matches. This includes anger about losing games or conceding goals, as well as joy about goals scored by their own team. Feeling sorry for one’s own team is a constitutive part of fandom. In this quote, the fan criticizes their own lethargy, describing this state as *shitty* because an elementary part of their fandom is lost. Other contributions describe a reduction in the duration of affects stemming from a match outcome; for example, from days to a few minutes.

In addition to the decline in emotion, other fans describe a decline in their interest in the club or in soccer in general, as in the following quote:

TABLE 2 Higher and lower themes.

Higher themes	Fans' perspective on their relationship to their favored soccer clubs	Fans' perspective on developments in the context of German soccer
Lower themes	<p>Negative changes in the emotional relationship:</p> <ul style="list-style-type: none"> <li>• Deterioration of the inner bond</li> <li>• Losing interest</li> </ul> <p>Negative behavioral changes in the relationship:</p> <ul style="list-style-type: none"> <li>• Consuming the favored club only</li> <li>• Changing/abandoning club-related consumption</li> <li>• Make use of alternatives/substitutions</li> </ul> <p>No or positive changes in the relationship</p>	<p>Commercialization:</p> <ul style="list-style-type: none"> <li>• Behavior of club's representatives</li> <li>• Monetary costs of soccer</li> </ul> <p>Governance:</p> <ul style="list-style-type: none"> <li>• Image of soccer associations</li> <li>• Influence of investors</li> </ul> <p>Attractiveness:</p> <ul style="list-style-type: none"> <li>• Excitement</li> <li>• Composition of the Bundesliga</li> <li>• VAR</li> <li>• Performance</li> </ul> <p>COVID-19 pandemic:</p> <ul style="list-style-type: none"> <li>• As a catalyst for other developments</li> <li>• Clubs and associations dealing with the pandemic</li> </ul>

*Since day one I am a VfB fan, I love the club, independent of all. But not even I am looking forward to matchdays, at least not as before. And I realize how the interest is getting smaller and smaller. (Q8: 26 – fan VfB Stuttgart; 17 years old)*

The fan remains loyal to the club, but a reduction in interest is evidence of a negative change in the relationship. Less interest can mean that fans invest less time in their club, or in soccer in general. As a result, one fan notes they would no longer know the names of the players of their favorite team (Q7: 18). Statements such as “The love for soccer has died out and that has nothing to do with the pandemic in my case” (Q2: 65) show how far-reaching changes in the emotional relationship can be.

The results show a decreasing psychological commitment, which is not or no longer resistant to criticism (Bauer et al., 2008). Instead, the emotional relationship to the club can also turn around. There is a continuum that describes the intensity of these changes. This ranges from being less *involved* to being completely emotionless to statements calling soccer *disgusting*. Although the emotional changes described also suggest a change in actions, this is not necessarily the case because the attitudinal and the behavioral dimension are two separate parts of the concept of fan loyalty (Dick and Basu, 1994; Bauer et al., 2008). The fans do not necessarily have to report a change in behavior in their comments, though it might exist. This explicit reporting of behavioral changes by the fans is explained below.

### 5.1.2 Negative behavioral changes in the relationship

In this context, fans report different changes in their realized consumption. One of these changes is that fans stop following other matches and exclusively consume their favorite club. The following quote illustrates this position:

*In the past, I used to watch almost every match, whether live or in the summary. Today, I only watch the matches of my club or visit the stadium accordingly. The rest hardly interests me anymore. (Q8: 16)*

In the sample, there are several quotes, almost identical in wording, where fans emphasize that they no longer follow soccer in general, besides the favored club. Another fan describes how they would like to save money on the live pay TV transmission, but “I cannot, because I still have to watch every BVB game” (Q8: 32 – fan Borussia Dortmund). In this quote, too, a distinction is made between soccer in general, and the favored club. Due to their loyalty to the club, there is a perceived obligation to follow the matches, even if costs are involved. These quotes clearly show that fans' negative behavioral changes might differ depending on the point of attachment; here, fans report negative behavioral changes in the relationship to soccer in general, but not to their favored club.

Other fans report that they have already gone one step further, meaning that they changed and limited their club-related consumption to different degrees; one being that fans no longer go to the stadium. This mainly manifests as not renewing season tickets, as in the following quote:

*I have not been watching for a few years now. My season tickets are a relic from days gone by. My last visit to the stadium was 5–6 years ago. I only watch the results of Hannover 96 now. But even that's not always the case. (Q3: 365 – fan Hannover 96)*

This fan has largely ceased consumption of soccer; in relation to Hirschman (1970), it could be said that he exited. Nevertheless, his relationship with the club Hannover 96 is not completely dissolved, because occasionally he still informs himself about the results. In this example, the exit entails a drastic change of behavior, but a certain connection remains, expressed in substitutional practices. These practices mean a significantly smaller investment of time and money in the club; however, this does not directly mean that fans completely

abandon their (former) favorite club. There are similarities between these results and studies from Healy and McDonagh (2013) or Tamir (2022) emphasizing fans' loyalty to clubs even in the case of changing consumption behavior.

The extent of change depends on the prior consumption of the respective fan. Like canceling a season ticket, some cancel their subscriptions with pay TV providers. In Healy and McDonagh's (2013) understanding, these fans (partially) exit the market but choose substitutional practices, like watching soccer for free instead. This could mean matchday summaries on public TV or on YouTube, even if the latter is only available after a few days' delay. The various mentioned substitutional practices match the findings of Tinson et al. (2023). Fans are capable of compensating for diminished value in different ways, while remaining loyal to their team.

What all these variants have in common is that the fans invest significantly less time and money in soccer. Another way of reducing consumption relates to social media. An example of this is the following quote: "Since the end of last year, I have unfollowed all channels that have to do with soccer and the Bundesliga. Also, my club: Dortmund" (Q3: 22). As a result of these terminated subscriptions, the (former) fan consumed less soccer content and the club has less range, which it could sell to marketing partners.

Another mostly emotional and symbolic expression was reported by one fan who "threw away all the jerseys. I do not watch that anymore" (Q2: 18 – over 50 years old). Another fan wrote about quitting his club membership: "We no longer pay for it. Too bad, I was a soccer fan and club member for over 50 years. We do not do that anymore" (Q2: 200). In contrast to the findings of Healy and McDonagh (2013), Tamir (2022), and Tinson et al. (2023), these actions symbolize a break with the (former) favored team to the fullest extent and are thus a (complete) exit from the club according to Hirschman.

In summary, there are two kinds of behavioral changes mentioned by the fans when referring to their relationships with their favored clubs. First, fans reducing their soccer-related consumption except for the favored club or showing substitutional practices of consumption, but in any case staying loyal to their club in some way. Second, fans expressing some kind of break with their formerly favored club, for example by stopping club-related consumption or, more symbolically, by canceling membership and throwing away bought merchandize. In short, fans abandoning their clubs.

Similar to changes in the emotional relationship, behavioral changes reveal a continuum of varying degrees of radical expression. Some fans describe that they have stopped a certain behavior according to Bauer et al. (2005, 2008), such as watching the game live on pay TV or consuming media related to the club, but they basically continue their fandom. However, there are also quotes in which fans describe a comprehensive turning away from the club and soccer:

*I escaped from professional soccer. Do not feel like it anymore. Sky and Dazn [pay TV providers] have been resigned. Now, I go to the Regionalliga [semi-professional 4th division] and watch the home matches every second weekend. I do not even care about the Bundesliga and everything related to it anymore. It just does not matter. I've been a Bayern fan for over 17 years. The last game I watched I do not remember at all, it has become boring. (Q3: 15 – fan Bayern München)*

In this quote, the exit from professional soccer and the once-favored club becomes clearly visible. Instead, the fan has sought and found an alternative.

In the sample, there are several examples of consumption alternatives to which fans refer. First, lower and amateur leagues of German soccer are frequently mentioned substitutions. Different to the results of Watkins and Cox (2021), this fan does not perceive their presence in non-league soccer as *polygamous* while still supporting professional soccer. Instead, they describe it as a real alternative. Fans emphasize different advantages of lower leagues in this regard; for example, a local connection or lower commercialization and costs. In some cases, women's soccer is also mentioned as an alternative, described with the same benefits. Within the mentioning of advantages, fans clearly show signs of romanticizing these leagues and the participating clubs. Similarities can be identified to the support of clubs such as HFC Falke or FC United of Manchester as *post-consuming* (Brandt and Kurscheidt, 2022). In principle, fans switching teams show that they stay loyal to the sport of soccer, even in the case of abandoning (exiting) a formerly favored club.

Nonetheless, some fans also mentioned different sports that they are currently following. As in this example:

*The current soccer is just perverse. For me, the process is such that I prefer watching American Football and Formula 1. Of course, these two sports aren't really better in terms of commercialization, but that's been clear from the start. (Q3: 165)*

It is noticeable that team sports are particularly popular. Among these, American Football is mentioned frequently. Here, the commenting fans are aware of the higher commercialization, but emphasize the greater competitive balance or intensity that is lacking in German soccer as the studies from Ramchandani et al. (2018) and Wagner et al. (2020) shows. According to Bühler (2006), soccer fans are limited in their search for alternatives. The sample shows that some fans are nevertheless capable of finding alternatives outside of the context of soccer.

### 5.1.3 No change or positive changes in the relationship

Within some comments, fans describe developments around their favored club or soccer in general as positive, or at least explain that their relationship to soccer did not change. One example of these few positive comments is the following, wherein a fan is clearly describing a positive change and an increasing emotional bond between them and their club:

*Last year it was just awesome to be a Mainz fan. It was painful not to be able to go to the stadium. I'm aware that Mainz is unfortunately only one of the few positive examples, but the bond has really grown stronger among many [fans]. (Q2: 9 – fan Mainz 05)*

In addition, more neutral comments exist, wherein fans describe their consumption practices as consistent and not restricted by certain developments, as the following example shows:

*I've been going to the stadium since [19]88, so a fucking pandemic cannot take away my desire. I'm still sitting in the stadium at [the age of] 75 (assuming I survive corona lol). (Q1: 16)*

Furthermore, some comments even report a positive attitude to developments in soccer and the Bundesliga more generally, including the favored club:

*Personally, I feel well entertained and I am happy when my club can sign good players. And if I can watch good soccer, I am willing to pay for it. There are a lot of things in life that bother me, that are actually unfair, but soccer is not one of them. It's pure entertainment and the business is only growing but that was never different. In the past, the players were also lured with a thousand nice things that were promised to them, and today it's just money because FIFA has more than enough of it. (Q7: 10 – fan Bayern München)*

The fan thereby disagrees with the opinion given within the respective media report, emphasizing gratitude for the recent developments in soccer and marking the more critical comments as romanticized fantasies. Similar comments use a polemic style, criticizing the viewpoints of the media reports and fans who endorse these perspectives in their comments. Those fans legitimize their argument by the fact that millions of German fans still follow soccer. According to [Bauer et al. \(2008\)](#), these fans are showing high levels of psychological commitment to their club or soccer more generally through their certain resistance to criticism. Fans reflecting no or even a positive change in their relationship to soccer prove that the discussion is not one-sided and that not all fans have to share the viewpoints of the media reports.

In summary, this section shows that the fans' perspectives on their relationships with soccer clubs varies. The connections can be undergoing several emotional or behavioral changes or no changes at all. Emotional or behavioral changes could be separated analytically as two parts of the concept of fan loyalty ([Dick and Basu, 1994](#); [Bauer et al., 2008](#)), but might be influencing each other in practice. In regard to this, and in the context of German soccer, fans mention various developments that could be understood as explanations for the (potential) dynamics and changes in the relationship. These will be explained in detail below.

## 5.2 Fans' perspective on developments in the context of German soccer

### 5.2.1 Commercialization

The results show that increasing commercialization processes have a negative impact on the relationship, meaning decreasing loyalty between fans and clubs or at least their connection to soccer in general. In this regard, commercialization is the most mentioned development within the comments. This follows [Merkel's \(2012\)](#) explanations, recognizing the increasing commercialization as a source of fan resistance in the context of German soccer.

Within their comments, some fans just mention increasing commercialization as the reason for changes without further explanation, as they believe readers would understand what the term means. An example is the following:

*When I was 6 years old, I started playing soccer and watched every game I could. Now I'm 23 and I never thought I'd say this, but soccer*

*is dead for me. It just has not been any fun for a while now. First and foremost is commercialization. (Q8: 17)*

In the following, two aspects of increasing commercialization will be described in more detail. These are the behavior of club's representatives (i.e., players, managers, and coaches) and the monetary costs of soccer consumption.

Fans criticize the behavior of representatives and players and their lack of identification with the club and its fans when referring to commercialization tendencies:

*I reject when I'm invited to watch the Champions League with my mates. Because I do not care about the business anymore. We fans have been totally cheated, we are just customers. Hardly any players have a bond with the club, they flee at the first crisis to the next higher salary. My heart bleeds when I write these lines here because that used to be my life. (Q3: 223)*

The lack of identification with the players reveals itself within the comments in different ways. First, fans criticize that players often change clubs because they (supposedly) earn higher salaries at a new club. In this context, the term *mercenary* is often used by fans. Second, fans criticize the salaries paid to top players and the sums to transfer them:

*18-year-old boys earn more a year than a normal person in their whole life—I've been out of it for a long time although I love soccer 😞 (Q4: 30)*

In the quote, the fan refers to a difference between himself, his earnings, and those of top soccer players. Third, fans criticize the behavior of players who earn these huge sums of money; that is, their consumption of luxury items, etc. ([Merkel, 2012](#)). This behavior is interpreted as ostentatious, and the conclusion is drawn that the players can only afford this behavior because the financially worse-off fans finance it.

This argumentation is linked with a second development in soccer that fans often criticize: increased consumption costs. Occasionally, the costs of stadium tickets, including travelling, are mentioned, but more often fans refer to the costs of watching broadcast matches live. Criticism is related to the fact that fans need to sign several contracts to follow all matches, as the responsible association sold broadcasting packages to different providers. Due to the large number of subscriptions, fans incur high financial costs as described in the following comment:

*The generation of money through TV rights has now taken on an absurd form. Sky, DAZN, Amazon, and who-knows-who-else all want a piece of the soccer cake and the fan, if he is unlucky, is allowed to pay every provider because the club is represented in all competitions. What is left for me, the fan? I've currently resigned everything except Sky and even there I'm considering not renewing. (Q3: 76 – Borussia Dortmund fan; 38 years old)*

In this context, fans repeatedly refer to the fact that they want to see all their clubs' matches; however, as their club participates in different competitions and several subscriptions are needed, fans decide, as in the quote, to limit their consumption. As described regarding behavioral changes in the relationship between fans and

soccer, alternative forms of consumption then become a possible option, such as watching sports on public TV or using freely available, but illegal online formats. On a rather emotional level, fans feel that their interests are ignored by the splitting of broadcasting packages and that financial benefits of associations are the main reason this happens. Furthermore, fans feel only recognized as customers not as emotionally committed supporters.

Nevertheless, not all comments express harsh criticism of all aspects of commercialization. Several commenters emphasize that they understand the behavior of players and grant them high earnings for their outstanding performance and for offering appealing entertainment.

### 5.2.2 Governance

Governance is another topic that fans discuss within their comments. This involves the attitudes and behavior of national and international soccer associations and other sports governing bodies. Fans accuse these organizations of having their own interests at heart, which are not in the best interests of the fans. Instead, according to the comments, these organizations are concerned with financially driven interests:

*I'm fed up with UEFA and FIFA, who just seem to own soccer, being mafia clans that cannot be kept in check by anything or anyone. (Q2: 112 – fan Borussia Dortmund)*

The drawing of parallels between mafia and soccer associations occurs several times in the comments, with suggestions that the people in charge enrich themselves unlawfully and criminally, acting as if they own soccer. Meanwhile, the fans describe a feeling of being at the mercy of these criminals, without any chance of rescue. Reference is made to them carrying out their machinations in public, even after investigations by the U.S. authorities since 2015.

Related to corrupt structures in soccer, Qatar's hosting of the men's 2022 soccer world cup was another frequently mentioned topic in the sample. This also included fans' criticism of the winter schedule, which was perceived as undermining their traditional viewing practices. Others refer to the human rights situation in Qatar, the working conditions for construction workers, or the lack of sustainability of the constructed buildings. This could result in a rejection of the competition:

*On top of that, there's the crap about a World Cup in inhumane Qatar. I'm going to boycott that. (Q2: 114)*

Beyond Qatar, the world cup in Russia is also criticized as propaganda for an authoritarian regime. Referring again to the concept of a mafia, fans criticize FIFA's cooperation with such states and allege that the association is only interested in generating money.

Another aspect of governance is related to club ownership. Here, fans criticize the entry of investors into soccer clubs, as in the following example:

*I find investor-constructs in soccer very problematic. In my view, it is obvious that in the long term this endangers identification and thus the substance of soccer club culture. (Q14: 19)*

In this context, the criticism is that investors would undermine the 50+1 rule in German soccer, which fans favor as a way to guarantee their influence (Bauers et al., 2020). According to Adam et al. (2020), restricting this influence brings the risk that supporters may exit. The fans also describe a lack of identification with clubs owned by private investors. Those clubs circumventing the 50+1 rule or standing as exceptions are described as less attractive related to the composition of the league. The majority of fans criticize investors, but there are also a few fans commenting that they have no problems with them. This is illustrated by the following quote: "If you have a romanticized image of soccer, then the thing with the investors bothers you, but I do not care" (Q3: 40). A few fans also consider investors as a possible way to end the sporting dominance of FC Bayern München.

### 5.2.3 Attractiveness

Within the comments, fans also refer to developments that affect the attractiveness and quality of soccer as a product, or as one Borussia Mönchengladbach fan describes it, "because it could hardly be more boring and uninteresting" (Q9: 25). Several fans describe the competitions as boring, which leads to decreasing interest, as in the following example:

*I'm a soccer fan with heart and soul, but the Bundesliga has become a dull affair, and since the same commercial clubs without tradition have dominated all the European cups, it's dull there, too. (Q3: 243)*

Boredom with the Bundesliga relates to two points. The first is the lack of excitement in the sporting competition. The most frequently cited example is that FC Bayern München has dominated the championship for many years. This lack of excitement is also transferred to individual matches where the outcome is more or less clear. In the case of the aforementioned quote, the lack of competitive balance is also transferred to international competitions, since here too the same teams are often found in the final rounds. These concerns about competitive balance have already been discussed in the literature (e.g., Ramchandani et al., 2018; Wagner et al., 2020).

Additionally, fans criticize the composition of the league; that is, the teams participating in the Bundesliga as the highest division. They affirm that the Bundesliga has no interest in specific teams—mostly those relatively new in professional soccer or from smaller cities such as Augsburg or Mainz. This also applies to clubs that are considered representatives of a commercially driven soccer, because they are circumventions or exceptions to the 50+1 rule (VfL Wolfsburg, TSG 1899 Hoffenheim, Bayer Leverkusen, and, in particular, RB Leipzig):

*But why should I buy a streaming service to watch Wolfsburg, Hoffenheim, Leipzig, and the permanent champions from Munich? (Q2: 24 – fan 1. FC Kaiserslautern)*

Fans complain that clubs they perceive as having a long and successful tradition, a large stadium, and a well-known fan scene, such as 1. FC Nürnberg, Hamburger SV, Schalke 04, or SV Werder Bremen, are not participating in the highest division regularly or, in cases like the 1. FC Kaiserslautern, are even permanently in lower divisions. However, some fans emphasize that these clubs have taken many wrong turns and are rightly in lower leagues. Clubs such as Mainz,

Augsburg, or Freiburg are described as legitimate members of the Bundesliga, because they rely primarily on young players and their work is therefore seen as positive and sustainable.

Another development that limits the quality of the product soccer in the eyes of the fans is the VAR:

*Abolish VAR because there are just too blatantly wrong decisions. They look for 6–10 min at actions and decide wrong and that week after week. These amateurs destroy soccer—just disgusting as they think they can bullshit you. I have already lost the fun of the most beautiful sport in the world by the VAR fraud. (Q8: 86)*

Similar to fans in the study by Schwab et al. (2023), fans complain about this technical development, but they do so because of a loss of emotions rather than a lack of transparency regarding disputed game scenes. Fans mention that their emotions are destroyed after scoring, because they need to wait for the VAR to check. However, there are some comments praising the introduction of VAR and hoping for further improvements: “Through the VAR there are fewer wrong decisions and fewer faked fouls. [...] I do not think that the emotionality has decreased noticeably” (Q8: 50). This different perception of the VAR once more shows that perceptions of certain developments differ between the fans.

Another issue is the performance of a fan's favorite team. Some fans express that their loyalty is not affected by the performance of the team they follow, emphasizing that they follow the team through thick and thin, and that “even a relegation would not scare me” (Q17: 1 – fan Union Berlin). Yet the sample also includes quotations where fans describe the relevance of performance for their loyalty, as in the following example: “I thought I was alone with this feeling because my club (Gladbach) has been shit for years and I've hardly watched the Bundesliga for years” (Q8: 24 – fan Borussia Mönchengladbach). Another fan emphasizes the relevance of team performance the other way around; that is, their relationship to the club became better after the club performed better:

*The results of your own team play a bigger role than you might want to admit to yourself in such a period [i.e., COVID-19]. I had exactly the same thing in the summer, no desire to watch football [soccer] at all. [...] Now that my club (VFL Osnabrück) is playing more successfully than ever before since I became interested in the club, I'm starting to look forward to the 2nd division at the weekend again because I'm simply enjoying the football that VFL Osnabrück is currently offering me. (Q1: 12-fan VFL Osnabrück)*

In summary, these quotations shows that a teams' performance can influence fans' relation to their favorite teams; contrary to Königstorfer et al. (2010) and Königstorfer and Urich (2009). However, this is not valid for all fans. It can generally be assumed that the fans are used to the “ups and downs” (Königstorfer et al., 2010, p. 666) of sport, and that factors other than the team's performance are of more importance to them (Bauer et al., 2005). However, the results at least suggest that ongoing poor performance might enforce an exit to some degree, whereas great successes can certainly strengthen the relationship with the favored team.

## 5.2.4 COVID-19 pandemic

Since the included media reports and comments were written/published between 2020 and 2023, developments surrounding the COVID-19 pandemic are also mentioned. Within the comments some fans reflect that the pandemic is having an impact on soccer as a kind of catalyst or *eye-opener* for them, as in the following quote:

*Corona has given a turbo-boost to the commercialization and the revelation of soccer's social deviance. (Q1: 7)*

The fans refer to the fact that professional soccer matches were allowed during that time although most other social activities had been prohibited. The outstanding position of soccer and its business became visible and was perceived as inappropriate. Furthermore, the fans refer to developments that have already been discussed in terms of commercialization and that thereby reveal interdependencies. Correspondingly, the fans write that these developments are not new, but that the audacity and distance of soccer to the reality of ordinary people has become more obvious through the pandemic. Potentially, this perception results in long-term criticism of developments in soccer.

Fans also refer directly to the attractiveness of consumption during the pandemic. They mention a change of quality due to soccer being presented without acoustically present spectators:

*90s of 2nd division are long enough. There are reasons why district league [meaning lower divisions] games are not broadcast on television. Probably I am just actually not a pure soccer purist, despite a 30-year Kicker [soccer magazine] subscription. I am out. Have fun. (Q10: 2)*

The fan describes no longer being able to watch broadcast soccer because they were missing an essential part of the game. Similar to amateur soccer, the shouts to the coach, players, and referees could be heard in the TV broadcast during the games without spectators. Emotions generated by the audience did not occur. Thus, the fans here indirectly refer to the co-creation of the spectators, which is part of the experience of a soccer game (Woratschek et al., 2020) and which was missing during the pandemic to some degree. Since these comments only represent snapshots, it can only be assumed how the commenting fans have reacted to the end of the pandemic and the return of spectators to stadiums. According to the results of Wilkesmann (2022), the pandemic seems to be only having a temporary effect without long term consequences. Indeed, several fans commented that they are going to come back after the pandemic, therefore showing positive intentions and behavioral loyalty according to Bauer et al. (2008).

Another development surrounding the COVID-19 pandemic shows a proximity to governance issues. Here, fans criticize how clubs and associations dealt with the pandemic. They thereby focus on measures employed to limit the virus's spread; specifically, measures dealing with unvaccinated fans:

*The clubs, that excluded us fans and had no criticism of the policy measures, did not deserve to get even a cent from us fans. I know that this is an individual opinion of a frustrated fan, but this discrimination, especially against the unvaccinated, was*

even forced by some clubs (e.g., Cologne, Frankfurt, etc.). (Q2: 71)

In this and other comments, fans perceive themselves as victims of discrimination and exclusion. In the statements, fans who feel excluded sometimes directly attack clubs and associations verbally, which implies a change in the emotional relationship.

In summary, fan comments surrounding the COVID-19 pandemic often refer to the previously described developments; that is, commercialization, governance, and attractiveness. For that, interdependencies could be assumed. Additionally, the pandemic might have worked as a eye-opener that revealed latent, or catalyst that increased preexisting negative developments in the eyes of fans.

## 6 Conclusion

Based on media reports addressing problems for fans in the context of German soccer, this study is concerned with the relationship between fans and the soccer clubs they favor. The focus thereby lies on the fans' perspective through analysis of their comments. The study confirms that the loyalties between fans and clubs are indeed complex and influenced by a variety of factors. Explicitly, the results revealed that the relationships between fans and their clubs are subject to various negative emotional and behavioral changes, which are mainly due to developments concerning commercialization, governance, attractiveness, and the COVID-19 pandemic in the context of German soccer. There are several theoretical and managerial implications emerging from these results which will be explained below in more detail. Finally, limitations and areas of interest for further research will be pointed out.

### 6.1 Theoretical implications

In view of the results obtained, it seems appropriate to further adapt and extend the *Exit-Voice-Loyalty-Framework*. The variations of reported emotional and behavioral changes show that the complexity and changeability of soccer fandom could not be fully covered with Hirschman's theoretical considerations. To exit in soccer does not mean taking one decision to exit. As emphasized in previous studies, fans might feel some kind of emotional detachment and alienation, even ceasing their club-related consumption, but nevertheless continue to support their club to some degree. However, some fans in the study sample reported that they permanently left their (formerly) favored clubs, with some reporting they found substitutions for their support in and outside of the sport of soccer.

The following question still remains, however: where does an exit begin and where does it end for soccer fans? A debate on the meaning of *exit* related to soccer fandom is therefore needed. The results show that a potential fan exit entails different emotional and behavioral changes; for example, a deterioration in the connection and a loss of interest, different levels of ceasing consumption, and the use of alternatives and substitutions. In both dimensions, a continuum of these changes in the relationship exists. In the emotional sphere, this ranges from less involvement, such as being emotionless, to rejecting the club by perceiving it as disgusting, for example. Consequently, an

exit could be defined as somewhere between being emotionless and enacting rejection.

In the behavioral sphere, an exit could be defined as something between minimalization of consumption (to different degrees) and a symbolic break with and radical abandoning of the formally favored club. The behavioral sphere can also be extended by aspects of substitutions and alternatives, with which the fans then fill their newly gained leisure time.

This understanding of the concept of an exit can help in further scientific discussions. For instance, the study contributes the finding that there are indeed fans in the field of soccer who are capable of permanently abandoning formerly supported clubs. To the best knowledge of the authors of this study, this behavior was only suspected in previous research, or reported in regard to the foundation of post-consumer clubs.

The study also showed that fans reflect a wide range of developments in the context of German soccer: from the behavior of clubs and institutional representatives, to the monetary costs of soccer, or the composition of the Bundesliga. A significant contribution has been made to systematizing these diverse and differentiated developments. Four categories were formed for this purpose, depending on whether the development relates to the commercialization, governance, or attractiveness of German soccer, or is due to the COVID-19 pandemic.

The study was also able to show the differentiation in fans' opinions; that is, fans can also assume positive positions in relation to the developments mentioned. Furthermore, it could be shown that the fan perspective can differ depending on which point of attachment is referred to: the sport of soccer in general or the respective favored soccer club. For example, there are several fans in the sample who report that they limit their soccer-related consumption to their favorite club only, and that soccer-related consumption beyond this was discontinued.

### 6.2 Managerial implications

The results of this study reveal various challenges for soccer clubs and decision-makers by confirming that the loyalty of soccer fans cannot be relied upon. Albeit that unconditional loyalty might be true for some of the fans studied, who report that their connection to clubs still exists, even in the face of negative emotional and behavioral changes. Furthermore, and as mentioned, not all of the researched fans reported negative changes or any changes in the face of soccer's current developments. Some show a certain degree of indifference, while others even report positive changes when considering soccer's commercialization, attractiveness, governance, or the influences of the COVID-19 pandemic. Despite this variation, the fact remains that there are still fans in the sample who exited and therefore show cracks in the common image of an *unbreakable relationship* between fans and the clubs they support. Consequently, decision-makers should be aware of fans' capacity to leave, and the possibility that the relationship between fans and soccer might be destroyed if overstretched should be understood as more than a merely theoretical possibility.

Concerning the mentioned developments, the fans report in general that their interests are not considered enough. The specific

cases differ but mainly refer to the described topics of commercialization and attractiveness, and in comparison, to a lesser degree to soccer's governance. However, none of these should be ignored. Decision-makers should also be aware of the possibility that the pandemic might have worked as a kind of catalyst that increased other negative developments in the eyes of fans. The positive fan comments make it somewhat more difficult to provide clear recommendations for actions. However, as benevolent commentaries form a minority in the sample, soccer's decision-makers are advised to look closely at the fans and their behavior in the future. In particular, the status quo of the fan-club relationship can be determined on the basis of the listed (potential) emotional and behavioral changes, and then compared over time. In the event of negative changes, the decision-makers may then have enough time to intervene before fans leave their clubs for good.

### 6.3 Limitations and areas of future research

Concerning the underlying research question, the results reveal the complexity of fans' perspectives on their relationship to soccer clubs. Nonetheless, this study offers an approach to systemizing the various viewpoints and reflected developments in this regard. However, the qualitative and explorative procedure has limitations and provides possibilities for further research.

The included fan comments might be biased due to the fact they are associated with the respective media reports. Further quantitative research is needed to broaden and deepen the understanding of the categorizations made. It would be especially helpful to check the connections between the identified higher and lower themes and how they impact each other. Although the chosen qualitative-explorative approach allows conclusions to be drawn in this regard, further quantification and statistical tests are required. For example, the connection between the attitudinal and behavioral dimension of the fans' loyalty could be investigated further, or to what precise extent the listed developments explain the various negative emotional and behavioral changes.

Furthermore, the data is limited to the information provided by the fans. Not all of the comments contain socio-demographic data on the age of the respective fan, the duration of the fan-club relationship, the favored soccer club, or other variables. This especially limits potential insights into the fan's life cycle. Here, further research is needed in order to collect this data, such as using a survey, for example. Further data about the participants might help to contextualize and classify the emerging results and findings.

This study's focus is German soccer and its fans, although within this study it was shown that the topic is also relevant to soccer fans in other countries. Future comparative studies might be interesting in this regard. Lastly, as with other research approaches, this study could not provide any evidence on non-respondents. Fans that have already chosen to exit from soccer might no longer be engaging in soccer-related online behavior, nor might they be willing to comment on soccer-related content.

Finally, soccer fans' relationships to favored clubs, including all the mentioned and described perspectives, changes, dynamics, and developments, promises to be a relevant and interesting field for further research. This study contributes to the closing of existing research gaps in this respect. In general, the emerging findings emphasize that descriptions and images of loyal fans, who would never turn away, are simplified—even if this might be true for some fans, as the results show. Consequently, it is time to modify the understanding of fans towards a more nuanced description. The scientific research on the topic had just begun.

### Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

### Author contributions

MK: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Validation, Writing – original draft, Writing – review & editing. CB: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Validation, Visualization, Writing – original draft, Writing – review & editing. SBB: Conceptualization, Supervision, Validation, Writing – review & editing. JB: Conceptualization, Data curation, Methodology, Validation, Writing – review & editing. GH: Conceptualization, Supervision, Validation, Writing – review & editing.

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### Conflict of interest

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# The attitude of online fans: perceived value, expectation, and identification on VAR satisfaction

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This study explores online fan satisfaction with the Video Assistant Referee (VAR) during the FIFA World Cup Qatar 2022. A structural equation model comprising perceived value, fan expectation, fan identification, and fan satisfaction was run. The online questionnaires were distributed among Chinese football fans. A total of 224 valid responses were received. Using indicators like Cronbach's alpha coefficient, Kaiser-Meyer-Olkin (KMO) statistic, and Bartlett's test of sphericity, the results were assessed for reliability, validity, and suitability. From the statistical results, the overall satisfaction of fans with VAR is the middle. Both fan expectation and perceived value positively affect satisfaction ( $p < 0.01$ ); the path coefficients were 0.26 and 0.57. Contrastingly, fan identification exerts no significant effect on fan satisfaction ( $p > 0.05$ ); and fan expectation indirectly affects fan satisfaction through perceived value ( $p < 0.01$ ); the path coefficient was 0.29. The highest effect value for fan satisfaction is perceived value, followed by fan expectation. Consequently, to improve online fan satisfaction with VAR, researchers should focus on perceived value. This research contributes to a greater more comprehensive of Chinese online fans' preference towards VAR at the FIFA World Cup Qatar 2022.

## KEYWORDS

online fans, Video Assistant Referee, FIFA World Cup Qatar 2022, satisfaction, structural equation model, decision-aid technology

## 1 Introduction

The accelerated pace of the game and the variety of technical and tactical changes introduce novel challenges for referees to adjudicate. The referee may also fail to observe certain fouls due to the large size of the soccer field and the frequent and unpredictable nature of fouls. In addition, physical stress (Pizzera et al., 2022), noise (Unkelbach and Memmert, 2010) home advantage (Goumas, 2014), and the team's reputation (Spitz et al., 2021; Pizzera et al., 2022) may also influence the decisions of referees. Mistakes, omissions, and misjudgments often occur in matches, often resulting to soccer referees are blamed and even abused by coaches, players, and fans. To optimize the game and promote fair play, the Fédération Internationale de Football Association (FIFA) has invested immense money and manpower into the referees' team, and a steady stream of technology has been introduced in the game (FIFA, 2016). The application of Video Assistant Referee (VAR) was agreed upon by the International Football Association Board (IFAB) in 2016, and the technology was officially introduced during the 2018 World Cup held in Russia. As an auxiliary penalty technology, the introduction of VAR is considered a revolutionary process in soccer because it provides referees with more information and time,

which exerts an impact on the accuracy of referees' decisions, as well as on player's foul behaviors, and fan's watching experience (Errekagorri et al., 2020; Han et al., 2020; Lago-Penas et al., 2021; Kubayi et al., 2022; Zhang et al., 2022).

Fans are defined as individuals who believe that they are supporters of a team (Dietz-Uhler et al., 2000). Alternatively, fans can also be defined from the following perspectives: sports behavior, participation in sports events, and cognitive levels (Gantz and Wenner, 1991; Murrell and Dietz, 1992; Wann and Dolan, 1994). Fans, the main audience of soccer games, are quite vital for football tournaments (Karafil and Akgul, 2022). On one hand, the presence of fans at the game sets the atmosphere and provides motivation for football players who transform fans' reactions for winning the game (Tamir, 2022); on the other hand, fans' enthusiasm and satisfaction can contribute value for professional tournaments and professional soccer clubs (Uhrich and Benkenstein, 2010). For example, fans purchase tickets and team merchandize impact the profitability of tournaments and clubs. Major broadcasting platforms acquire broadcasting rights to attract a larger online audience, while brands are offered the right to display their logos and products or to operate stalls (i.e., a means of utilizing sponsorship). Thus, fans' support and association of the sponsor's brand contribute to the brand's profitability (Bristow and Sebastian, 2001). Research indicates that an increasing emphasis on fan satisfaction within the sports industry (Grove et al., 2012; Sarstedt et al., 2014). Fan behaviors, such as sports attendance and loyalty, are significantly impacted by fan satisfaction (Trail et al., 2005; Shonk and Chelladurai, 2008), this highlights the importance of fan satisfaction in sports. According to FIFA financial reports, the largest share comes from the sale of television broadcasting rights (FIFA, 2023). Online fans, who watch matches either through television signals (cable operators or similar) or through live streaming (internet websites or platforms), play a crucial role. Therefore, ensuring the satisfaction of online fans is equally quite essential.

Although the significance of online fans, the number of studies on fan perceptions towards decision-aid technology in sports is limited (Hamsund and Scelles, 2021), and scientific research, which focuses merely on the satisfaction of online fans with VAR, remains limited. Notably, despite the FIFA World Cup Qatar 2022 was the best-equipped and largest event for VAR utilization, the satisfaction of online fans with VAR has not yet been investigated. Therefore, it is quite meaningful to analyze online fan satisfaction. The current study aims to analyze the satisfaction of online fans with VAR and the factors affect the satisfaction. Based on previous studies, we have selected perceived value, fan expectation, fan identification, and fan satisfaction as variables. Our hypotheses include perceived value, fan expectation, and fan identification have a significant impact on fan satisfaction, fan expectation positively influences perceived value, and fan expectation indirectly affects fan satisfaction through perceived value.

## 2 Literature review

### 2.1 Perceived value and fan satisfaction

Zeithaml (1988) defines perceived value as follows "Value is what you are paying for what you are getting", and believes that the core

of perceived value is the overall evaluation effected by individuals after comparing and weighing their perceived gain and perceived loss. Perceived value, as a variable, is often utilized in the analysis of service industries such as tourism and catering. In their analysis on the catering industry, Ge et al. (2021), Slack et al. (2021), and Tuncer et al. (2021) respectively noted that perceived value exerts an impact on satisfaction. Zeithaml (1988), via the psychology perspective, proves that consumers' high perceived value of products is conducive to higher customer satisfaction. In sports, Cronin et al. (2000) studies on sports events indicate that perceived value exerts a positive impact on satisfaction. In the research on the satisfaction of tennis event spectators, it is observed that the enjoyment and economic perceived value of the spectators exerts a positive impact on satisfaction (Wang et al., 2021). Calabuig-Moreno et al. (2016) conducted a study utilized a basketball club in the Spanish League to investigate the satisfaction of 563 spectators to the game, and they noted that the perceived value positively affects the satisfaction of the audience. Similarly, the research on basketball audience satisfaction indicates that perceived value is the most influential factor in sports audience satisfaction (Moreno et al., 2015) and Mostaghimi et al. (2016) obtained similar conclusions.

Based on the aforementioned research, the following hypothesis is proposed:

H1: Perceived value positively affects fan satisfaction.

### 2.2 Fan expectation and fan satisfaction

The variables in the Swedish Customer Satisfaction Barometer (SCSB), the American Customer Satisfaction Index (ACSI), and the European Customer Satisfaction Index model (ECSI) all contain customer expectations; Tong et al. (2022) noted that those public expectations directly influence public satisfaction in their investigation of Chinese residents' contentment with community health education. In the consumer behavior field, based on the expectation theory proposed by Oliver (1980), numerous studies explore the relationship between consumer expectation and satisfaction. Cardozo (1965) noted that consumer satisfaction is lower when products do not meet consumer expectations. Research on customer satisfaction in the Iranian automobile market indicated customer expectations affect perceived value and satisfaction (Mostaghimi et al., 2016). Another researcher based on the ACSI analyze community health education indicated the expectation indirectly affects fan satisfaction through perceived value (Tong et al., 2022).

Based on the above research, the following assumptions are made:

H2: Fan expectation positively influences perceived value.

H3: Fan expectation positively affects fan satisfaction.

H4: Fan expectation indirectly affects fan satisfaction through perceived value.

## 2.3 Fan identification and fan satisfaction

In the social identity theory, individuals who become part of a group gain a sense of belonging and create more emotional connections. When constructing the Sports Spectator Satisfaction Model (SSSM), Van Leeuwen et al. (2002) indicated that fans with higher identification exhibit higher satisfaction than those with lower identification. Fans with a higher degree of identification concentrate more on the match and its result. In football, if a fan exhibits a higher identification with a certain team, they usually display behaviors and attitudes that are in the best interests of the team (Masayuki et al., 2015). However, Winand et al. (2021) observed that for a team, the higher the degree of identification, the lower the satisfaction with VAR. The utilization of VAR exerts a negative impact on the competition and athletes. Football fan has emotional connection with a club, the stronger the identification with the team by the fans, the more likely they are to be committed to safeguarding its best interests (Winand and Fergusson, 2018).

Therefore, this study raises the following assumption:

H5: Fan identification negatively affects fan satisfaction.

In summary, the current study develops a structural equation model of fan satisfaction with VAR, which is depicted in Figure 1.

## 3 Methods

### 3.1 Questionnaire design

Based on previous studies (Bauer et al., 2008; Peng et al., 2019; Luan and Zhang, 2020; Winand et al., 2021), a designed scale was utilized to evaluate the perceived value, expectation, identification, and satisfaction of fans. The fan satisfaction measurement was adapted from Winand et al. (2021), and included comments such as “I agree with the utilization of VAR in FIFA World Cup matches” and “I am satisfied with the utilization of VAR at the FIFA World Cup Qatar 2022.” The assessment of perceived value was adapted from Peng et al. (2019), and it included questions such as “I think VAR has enhanced the quality of football matches at the FIFA World Cup Qatar 2022,” “I think VAR has enhanced the atmosphere of the games,” and “I think the utilization of VAR in FIFA World Cup Qatar 2022 has instilled a sense of pleasure in me.” In the main section of the questionnaire, fans’ opinions were collected in the form of a 5-point Likert scale, with “1” representing not satisfied at all, “5” representing quite satisfied, and “3” representing average. The questionnaire was distributed to fans via an online format.

### 3.2 Selection of variables

Based on the evaluation of fan satisfaction, the data pertaining to each variable were tested for Kaiser–Meyer–Olkin (KMO) and Bartlett’s sphericity (KMO = 0.864), and the approximate chi-square value was large with  $p < 0.001$  (Table 1). This result indicated that the data were suitable for factor analysis. When extracting the common factors, it was observed that all common factors exhibit  $>0.7$

Cronbach’s Alpha. Thus, 4 latent variables were suitable, along with 13 measurement indicators.

## 3.3 Data collection and analyses

The questionnaire was distributed between November 20 and December 18, 2022. Wjx, an online survey system, was utilized to construct and perform the survey. The questionnaires were distributed using a convenience sample among Chinese football fan, receiving a total of 245 responses. After excluding the ones with an exceedingly short answering time and high consistency of answers, 224 valid questionnaires were collected, and a 91.42% recovery rate was observed. Herein, reliability and validity were tested using the statistical software IBM SPSS version 26.0 (IBM Corp., Armonk, NY), and using Cronbach’s alpha coefficient, the questionnaire reliability was assessed. The principal component analysis (PCA) and varimax-rotation methods were employed for conducting factor analysis; using the Kaiser–Meyer–Olkin (KMO) statistic, Bartlett’s test of sphericity, and the cumulative variance, the questionnaire’s validity was assessed. The assessment validity for each dimension involved composite reliability and the average variance extracted. To judge the model adaptation, the normed chi-square (CMIN/DF), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), root mean square error of approximation (RMSEA), normed fit index (NFI), and Tucker–Lewis Index (TLI), comparative fit index (CFI), normed-fit index (NFI), parsimonious normed-fit index (PNFI), parsimonious goodness-of-fit index (PGFI), and parsimonious comparative fit index (PCFI) were considered. Using Bootstrap sampling, the coefficient product method was applied to test for mediating effects; 2,000 replicate samples were selected with 95% confidence intervals,

## 4 Results

The results of the reliability and validity tests exhibited a Cronbach’s Alpha coefficient greater than 0.7 indicating that the questionnaire possessed more optimal internal consistency. Table 2 indicates the Alpha coefficients of the four latent variables in the 0.752–0.856 scale range. Additionally, the Alpha coefficient for the overall questionnaire is 0.842, indicating good reliability of the scale (Table 2).

The principal component analysis (PCA) and varimax-rotation methods were utilized for factor analysis, a total of four common factors were extracted, and the explained variance rate attained 73.36%. The factor loading matrix after conducting the varimax-rotation method is illustrated in Table 3. Factor scores for the selected indicators were all higher than 0.6, which indicates that the observed variables can effectively reflect the four latent variables of perceived value, fan expectation, fan identification, and fan satisfaction. CR is another method of determining the questionnaire’s reliability (Wang et al., 2022). The reported CR was higher than 0.70, which indicated satisfactory reliability. Factor loading and the AVE of each variable are usually utilized to evaluate the validity of the scales. The test result indicated that factor loading was higher than 0.5 and that the AVE exceeded 0.5 (Mia et al., 2022; Zhao et al., 2022), which indicates that the questionnaire exhibits satisfactory validity.

TABLE 1 Test results of Kaiser–Meyer–Olkin and Bartlett on theoretical indicators.

KMO	Bartlett's sphericity test		
	Approximate chi-square value	Df	<i>p</i> value
0.846	1402.209	78	<0.001

TABLE 2 Results of confirmatory factor analysis.

Latent variable		FL	Cronbach' $\alpha$	AVE	CR
Summary table			0.842		
Perceived value	FV1	0.786	0.845	0.647	0.846
	FV2	0.803			
	FV3	0.824			
Fan expectation	FE1	0.796	0.836	0.639	0.841
	FE2	0.873			
	FE3	0.722			
Fan identification	FI1	0.734	0.752	0.503	0.752
	FI2	0.699			
	FI3	0.694			
Fan satisfaction	FF1	0.744	0.845	0.619	0.865
	FF2	0.822			
	FF3	0.889			
	FF4	0.676			

Discriminant validity among the latent variables can be established when the AVE of each variable is greater than the correlation coefficients between variables after considering the square root. Table 4 indicates that the AVE for perceived value, fan expectation, fan identification, and fan satisfaction are all greater than the inter-dimensional correlation coefficients, which indicates satisfactory discriminant validity between the four dimensions of the scale.

The test results of model adaptation exhibited good fit (Table 5), which indicates that the fit indexes meet the criteria of SEM studies. This study utilizes four questions to measure fan satisfaction, with the following means: “FF1” ( $M = 4.41$ ), “FF2” ( $M = 3.68$ ), “FF3” ( $M = 3.70$ ), and “FF4” ( $M = 3.61$ ); as illustrated in Table 6; Figure 2 indicate that perceived value and fan expectation impact fan satisfaction ( $p < 0.01$ ), and that fan expectation impacts perceived value ( $p < 0.01$ ). Thus, research hypotheses H1, H2, and H3 are supported. However, because the impact of fan identification on fan satisfaction has not attained a statistically significant level ( $p > 0.05$ ). Therefore, Hypothesis H5 is not supported. The confidence interval for the results of the mediated path analysis was [0.173 ~ 0.465], with a confidence interval not containing 0, an effect value of 0.293, and the value of  $p$  less than 0.01, which indicates a significant effect of the mediated path. The path coefficient results are depicted in Table 7. Thus, research hypothesis H4 is supported.

## 5 Discussion

This study employed a structural equation model to analyze online fan satisfaction with the utilization of VAR at the FIFA World

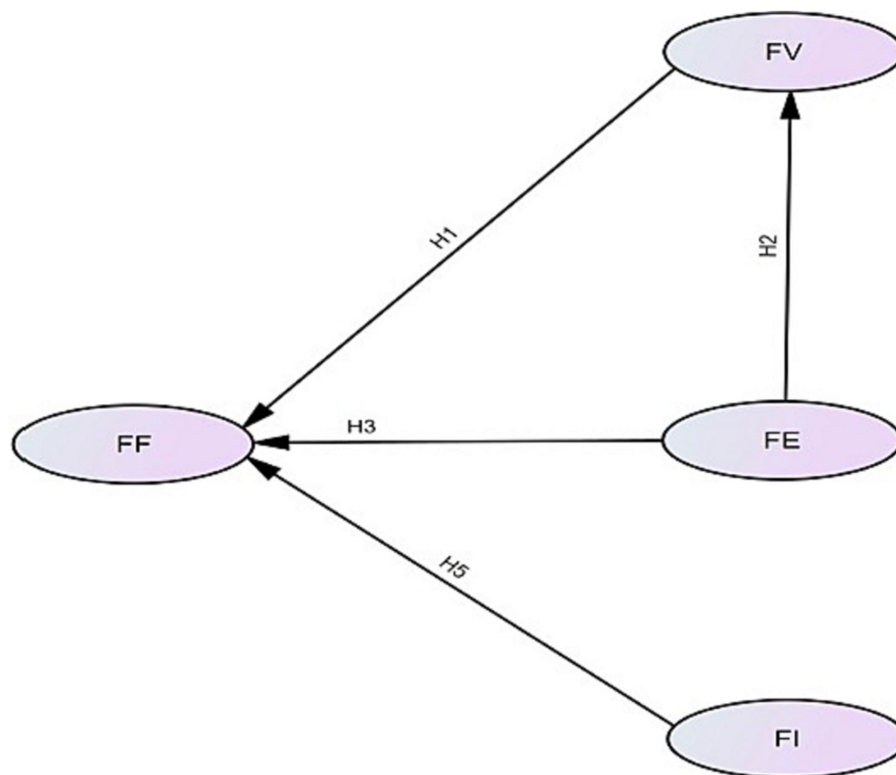


FIGURE 1  
Hypothetical relationship model of online fan satisfaction with VAR.

Cup Qatar 2022. From the statistical results, the overall satisfaction of fans with VAR assumes the middle value. The fitting results of the structural equation model indicated that perceived value and fan expectation exert a positive effect on satisfaction, and that fan expectation indirectly affects fan satisfaction through perceived value. In addition, the highest effect value for fan satisfaction is perceived value, followed by fan expectation. However, fan identification does not exert a significant effect on satisfaction.

The majority of fans agree with the utilization of VAR because it generally exerts a positive impact on the game: it enhances the accuracy of penalties and reduces malicious fouls (Goumas, 2014). The statistics indicated that fan satisfaction was average, and Winand et al. (2021), who explored the satisfaction of German and English fans with VAR, also noted that the overall satisfaction of fans was average, with the satisfaction scale data exhibiting neutral values. This observation may be rationalized as follows: the utilization of VAR has exerted numerous negative effects on the game. The number of game interruptions increased, which exerted a negative impact on athlete status (Carlos et al., 2019; Han et al., 2020). In addition, fans exhibit an emotional connection with their favorite team and may project, deny, or transfer the emotion of the team's goal and result of the game to other factors. With regard to fans, VAR is an emotion transfer object, which also affects VAR satisfaction. In Bertin et al. (2023)'s study, it was also noted that negative tweets on VAR increased at the end of the group stage, which may be related to the elimination of the team, and the fans expressed negative emotions on VAR to rationalize the situation of the team and maintain the image of the team.

The higher the VAR fan perception value, the higher the actual satisfaction of the fan. Perceived value was identified as the most influential variable in all studies, herein, the results of this study are similar to those of previous ones (Greenwell et al., 2002; Moreno et al., 2015; Calabuig-Moreno et al., 2016). Using the analysis path, it was noted that the fan's perceived value of VAR in enhancing the quality and atmosphere of the game exerted a marginal impact on VAR satisfaction. This observation may be rationalized as follows: fans usually discuss controversial events during the match, and the heated discussion of fans on match events impacts the match atmosphere. The application of VAR can provide fans with correct penalty results, which reduces the opportunity for fans to discuss (Winand et al., 2021); thus, fans exhibit less perception of the enhanced match atmosphere after VAR intervention. Therefore, the impact on satisfaction is less considerable. Second, the most direct perception of online fans after the intervention of VAR is as follows: it interrupts the game and affects its fluency. Therefore, the perceived value of enhancing the quality of the competition is limited, and so is the impact on satisfaction is smaller.

The higher the fans' sense of acquisition after the application of VAR, the higher the evaluation of VAR. Therefore, it is proposed that the VAR equipment be optimized, which can not only provide referees with clearer videos but also enhance the comfort of online fans watching matches when VAR intervenes. The FIFA World Cup Qatar 2022 stadiums are considered to be an effective method of increasing fan satisfaction with VAR by providing timely feedback (Hamsund and Scelles, 2021). Thus, it is recommended that major leagues provide fans with the referee review screen and report the results on the big screen and the live broadcast platform to enhance the fans' watching experience. In addition, leagues should optimize the selection of referees, unify the penalty scale, and enhance the workability of referees; thus, the number of unnecessary interventions can be reduced.

According to the research results, fan expectation can directly and positively affect fan satisfaction, and Tong et al. (2022) also arrived at this conclusion. When testing the intermediary path, it is observed that fan expectation can also indirectly affect fan satisfaction by influencing fan perceived value (Mostaghimi et al., 2016; Tong et al., 2022). The aforementioned observation may be rationalized as follows: expectation is considered a cognitive basis in the evaluation of satisfaction of fans (Cardozo, 1965). Fan expectation of VAR is based on fans' understanding of the application rules, application value, and VAR concept. "Minimum intervention, maximum benefit" idealizes the VAR concept. The utilization of VAR is not aimed at correcting all wrong decisions, nor pursuing a 100% accuracy level for all decisions. VAR should ideally enhance the fairness of the game; to avoid a scenario in which the game is excessively interrupted, VAR intervenes against "clear and apparent errors" or "seriously missed incidents" within the rules that change the course of the game (IFAB, 2019).

TABLE 3 Factor loading matrix.

Variable	component			
	1	2	3	4
FV1	0.685			
FV2	0.885			
FV3	0.818			
FE1		0.820		
FE2		0.834		
FE3		0.824		
FI1			0.824	
FI2			0.811	
FI3			0.814	
FF1				0.726
FF2				0.876
FF3				0.849
FF4				0.614

TABLE 4 Discriminant validity analysis.

	Perceived value	Fan expectation	Fan identification	Fan satisfaction
Perceived value	0.804			
Fan expectation	0.434	0.799		
Fan identification	0.074	0.081	0.709	
Fan satisfaction	0.627	0.502	0.081	0.787

However, fans will be unsatisfied if VAR is not conducive to the team they support or does not intervene in the events of the match that fans feel should be reviewed. Thus, to enhance fan satisfaction, publicity efforts should be increased, and fan expectations on the utilization of

VAR should be appropriately guided. The promotion of the use of VAR should not only show fans the rationality of the existence of VAR and the process of using VAR, but should also promote the concept of VAR, show the improvement of VAR, the beneficial effects of the use of VAR on the game. Then promote the fans to further understand VAR in order to create reasonable expectations.

Through the path coefficient analysis, it is noted that fan identification exerts no significant impact on fan satisfaction. This research result is consistent with that of Winand and Fergusson (2018) who considered goal-line technology (GLT); however, it is inconsistent with that of Winand et al. (2021) who analyzed VAR. This observation is mainly attributable to the following: the objects investigated herein are mainly Chinese online fans, the China National Football Team did not participate in the FIFA World Cup Qatar 2022. As a major factor affecting the identity of football fans, compared with the local fans of each participating team, Chinese fans lack a sense of belonging and local identity (Wann and Tucker, 1996). When the team changes the score or wins the game with VAR, football fans lack extreme excitement, happy emotions, and identity pride. Similarly, when VAR is involved, losing a match to an opponent or lagging behind can only lead to temporary disappointment and anger from fans (Dong-Kyu, 2020). Thus, the following relationship is observed: fan identification

TABLE 5 Fitting coefficients of the model indicators.

	Judgment standard	Measure value	Acceptance level
CMIN/df	1–3	2.093	Good
GFI	>0.900	0.916	Very good
AGFI	>0.800	0.875	Good
RMSEA	<0.080	0.070	Good
NFI	>0.900	0.911	Very good
TLI	>0.900	0.937	Very good
CFI	>0.900	0.951	Very good
PGFI	>0.500	0.614	Good
PNFI	>0.500	0.713	Good
PCFI	>0.500	0.744	Good

TABLE 6 Model path coefficient of structural equation model and hypothesis test results.

The path	Unstandardized coefficient	standardized coefficient	SE	CR	p	results
H1 FE → FV	0.514	0.599	0.081	6.429	***	support
H2 FE → FF	0.259	0.278	0.098	6.086	***	support
H3 FV → FF	0.569	0.523	0.083	3.337	***	support
H5 FL → FF	0.022	0.020	0.057	0.441	0.725	nonsupport

\*\*\*Significance level < 0.01.

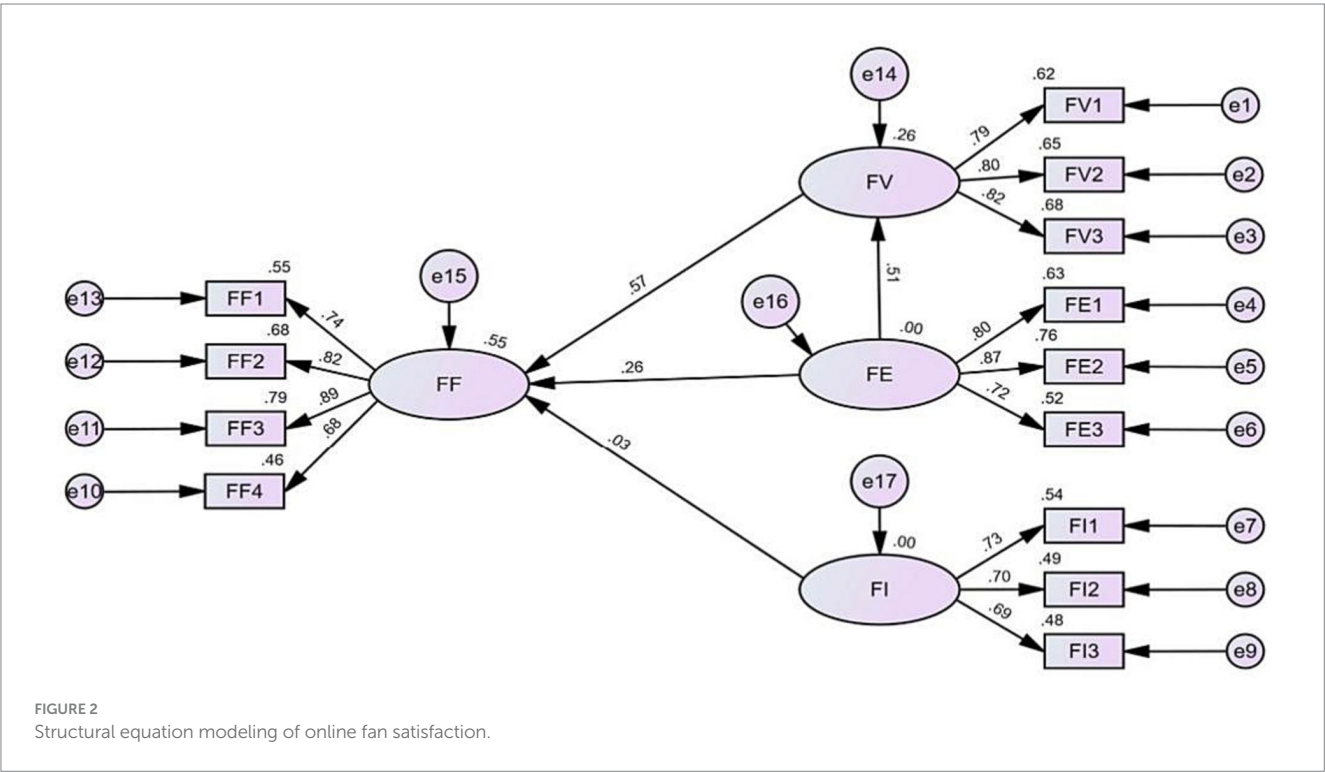


TABLE 7 Effects test.

The path	effects	<i>p</i>	Standard error	95%CI
FE → FF	0.570	***	0.093	0.372 ~ 0.739
FE → FV	0.514	***	0.092	0.328 ~ 0.686
FV → FF	0.260	***	0.098	0.074 ~ 0.449
FE → PV → FF	0.293	***	0.074	0.173 ~ 0.465

\*\*\*Significance level < 0.01.

exerts no significant impact on fan satisfaction, which is inconsistent with the findings of Winand et al. (2021).

## 6 Conclusion

The satisfaction and feelings of fans must be highlighted because they crucially influence the development of the football economy and sports industry. Based on the common indicators associated with satisfaction models in the marketing field, and on the theoretical reference pertaining to previous studies, this study constructed a VAR-based fan satisfaction model and is the first to investigate Chinese football fans' VAR perception. The study selected perceived value, fan expectations, fan identification, and satisfaction as the variables for the structural equation model. It proposes that the overall satisfaction of fans with VAR assumes the middle value. The study indicated that fan expectation and perceived value positively affect fan satisfaction and that perceived value exerts an intermediary role between fan expectation and fan satisfaction, whereas fan expectation indirectly affects fan satisfaction through perceived value. To enhance fan satisfaction and, enhancing the public image of VAR, publicity efforts should be increased, and fan expectations on the utilization of VAR should be appropriately guided.

## 7 Limitations and suggestions for future research

Even if the proposed model is tested, some limitations persist. The questionnaire is issued to Chinese fans, and the teams participating in the World Cup are mostly distributed in various countries; therefore, the satisfaction of fans in different countries and regions with the World Cup VAR can be compared. In addition, some studies have indicated that the utilization of VAR in crucial moments of the game has an impact on match results (Kolbinger and Knopp, 2020; Bertin et al., 2023), and that the number of tweets on negative emotions associated with VAR increases. Therefore, more variables can be added to future research on fan satisfaction with VAR.

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## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the patients/ participants was not required to participate in this study in accordance with the national legislation and the institutional requirements.

## Author contributions

PD: Writing – original draft. WY: Writing – review & editing. YY: Data curation, Writing – review & editing. YZ: Resources, Writing – review & editing. LZ: Supervision, Writing – review & editing.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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# The surprising role of marital status on sport second-screening: demographic influences during the 2022 world cup viewing in Israel

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To better understand what characterizes those who use a second screen while watching sport, the study examine a variety of demographic factors influencing browsing device trends before, during ("second screen"), and after sports games. It does so by utilizing survey data from Israeli viewers of the 2022 World Cup using a convenience sample ( $N = 242$ ). In line with our hypotheses, those with higher education and higher reported income were more likely to browse devices for information around and during games. Against our hypothesis, young adults were less likely to engage in browsing before, during and after the games, possibly because they tend to watch games with friends or in public places. Divorced and single individuals are more likely to engage in multi-platform browsing and second-screening during sport games vs. married participants, who tended to watch the games with friends or in public places. The results are the first to indicate the important role of marital status in second-screening during sport games. Overall, they depict a picture of the average second-screener as a non-married older male with higher income and education, thus indicating that higher intellect combined with non-marital status, thus potentially more spare time as well as possibly higher levels of loneliness and during games are linked to sport second-screening. The results are the first to highlight the important role of marital status over young age on the tendency to second screen during sport games.

## KEYWORDS

sport, Israel, social networks, media, soccer

## Introduction

The nature of television viewership is rapidly changing, with surveys indicating that around 85% of viewers occasionally enhance their viewership with the use of other devices (1). This raises questions what characterizes audiences who use more than one device; for example, is it unique for young audiences and thus potentially reflects the viewership of the future, or whether it relates to education or high intellect and thus reflect elite viewing, or, alternatively, characterizes a specific gender etc. The second-screen trends are particularly evident in the sport realm, where traditional prime-time television viewing as a sole experience is largely enhanced by many sports fans with multi-platform engagement with content related to the games (2). This phenomenon, known as multi-platform browsing, involves the consumption of sports content via

different devices such as smartphones, laptops/desktops, and tablets (3). Additionally, the synchronous multi-tasking of using devices during games is referred to as “second-screening” (4–6).

The aim of this paper is to contribute to a better understanding of the demographics and characteristics of individuals who enhance their sport viewership experience through second-screening and multi-platform engagement. Despite several studies conducted in the last decade (3, 7, 8), a comprehensive review of the literature from 2021 identified major gaps in understanding the demographics and motivations behind these behaviors (9).

To address these gaps, this study utilizes a case study of Israelis’ TV consumption patterns during the 2022 Qatar World Cup. In our study, we tried to include a multitude of demographics in order to give a wider perspective than the one provided so far on the characteristics of second screeners. A convenience sample of 272 participants was used, and the study examined main demographic characteristics, including age, gender, income, education, and marital status. While most of these aspects were previously included in analyses (8), this study is the first to investigate the impact of marital status. Marital status is an important factor to consider due to previous studies that have found a strong association between marriage and sport engagement (10–12), mostly as a factor reducing sport consumption due to marital commitments.

The theoretical rationale behind the study is to better characterize the act of second screening and understand whether it is a reflection of intellectual enhancement of viewing, thus reflect a positive trend or whether it is related to other aspects such as boredom and loneliness, or, alternatively, is simply a mirror of young adults who are used to multi-tasking rather than focusing on the television screen. In other realms, such as political communication, there is more vibrant debate, specifically as to whether second screeners are highly involved individuals who seek to challenge the content they watch on television (13) or, alternatively, whether they mostly communicate during television viewership with like-minded individuals to reinforce their existing views and maintain their confirmation bias, thus reflecting a more negative trend (5). The analysis of the characteristics of second-screeners in the sport realm aims to advance the understanding of the potential meanings behind second screening during viewership of sport games. The study will add a unique contribution adding less studied aspects such as marital status to better understand the demographics behind second screening and thus indicate motivations behind this trend in the sport realm. The following literature review will detail the involvement of second-screening in the sport realm and the (limited) literature (14–20) on the issue to date.

## TV sport viewing: from single task to multi-task and multi-platform

The traditional experience of watching sport games on television with undivided attention to the game is mostly associated with the radio and television glory days. However, since the first decade of the 21st century, there has been an

increasing trend of enhancing TV viewing experience with multi-platform sport consumption (21). Commonly used devices for this purpose are laptops, tablets, and smartphones, which offer advanced computer abilities and web access (22). The rise of online social networks and their growing popularity has further fueled the engagement of sport fans in activities such as watching YouTube videos about teams, participating in game-related discussions on Facebook, reading tweets about the game, and following star players and athletes on Instagram before, during, and after the games (23, 24).

A 2023 YouGov analysis of nearly 20,000 sport fans from 18 countries found that young adults actually preferred watching sport games via social media broadcasting over television. However, when considering a broader perspective, television is still the preferred sport consumption platform for every other age group (22). Most studies examining the interplay between traditional TV viewing and device use during games confirm the dominant role of television in the sport consumption experience, with devices serving as secondary tools. Tang and Cooper’s (3) analysis of multi-platform viewing during the 2012 Olympics, as well as Hutchins and Sanderson’s (25) analysis of the 2016 Rio Games, identified that the use of digital, mobile, and social media occurred in a manner that emphasized the primary status of TV broadcasting. Tang and Cooper’s (26) analysis of the viewing of the Tokyo Games further demonstrated that pre-Olympic multi-platform data consumption was the strongest predictor for watching the games on various platforms.

Despite these analyses, there have been surprisingly few studies examining the main demographics behind multi-platform sport consumption, which is a crucial aspect in understanding the main drivers behind device usage before and after games. Tang and Cooper (3) examined the impact of gender on browsing behaviors before and after sport games and found that although men and women exhibited different media consumption patterns and broader device usage during the 2008 Beijing Olympic Games, they sought similar content across various media platforms and devices. Another study by Copper and Tang (27) examined the differences in device usage between fans and non-fans during the 2008 Beijing Olympic Games, revealing similar behaviors. Regarding the role of age, as mentioned earlier, a recent YouGov study (22) unsurprisingly indicated that age plays a significant role in multi-platform adoption, with young adults being the only cohort that prefers watching games via new media devices rather than on television.

## Second screening during sport games

The phenomenon of second screening refers to the use of additional devices concurrently with television viewing, typically for activities such as reading tweets, texting about the game, and engaging in discussions about games and players on platforms like Reddit (28). One study highlighting the popularity of second screening revealed that 70% of NFL viewers use another device while watching games on TV (29). Cunningham and Eastin (2) suggest that the attractiveness and drama of games are significant

factors influencing the likelihood of fans engaging in second screening. Lopez-Gonzales et al. (30) argue that the discourse on second screening underestimates its magnitude by focusing mainly on Western contexts and overlooking trends in India and China where devices are the primary platform for viewership.

Various studies have addressed the motivations behind second screening, with team identification being strongly linked to the habit. Gantz and Lewis (31) and Harboe et al. (32) found that second screening is used to foster a sense of belonging and strengthen social ties among fans. Similarly, Witkemper et al. (7) documented the role of second screening in strengthening the bond between sport fans and their teams. Phonthanukitithaworn and Sellitto (33) argue that sport fans develop and nurture a sense of community through texting during games. Billings's et al. (8) study revealed that viewers primarily used second screening for distraction and to enhance the enjoyment of the game through data collection about the game and the players.

Fewer studies have examined the demographics of second screening and the interplay between age, marital status, education, and the tendency to engage in this behavior. A study of 393 National Football League fans found that male, younger, and highly educated participants had a higher tendency to second screen Billings's et al. (8). This is, to our knowledge, the only study which highlighted a link between education and second-screening, reflecting second screening as an intellectual enhancement to television viewing. Other studies found that second screening was most prevalent among the young, with those aged 18–34 showing a similar inclination to watch games on various devices rather than solely on television (30). Similar findings were identified regarding concurrent engagement in an active mobile game while viewing a secondary screen (6, 34). Weimann-Saks et al. (35) found that in Israel, most viewers preferred to watch games together, but co-viewing did not always mean physically being in the same vicinity, as they often engaged in texting with friends during the game.

Based on the existing literature, the following hypotheses are proposed:

H1: Young adults are more likely to engage in browsing before, during, and after the game compared to other age cohorts, in line with Sim's (22) study on multi-platform consumption across generations and Billings' (8) study on second screening across different age groups.

H2: Participants with higher education are more likely to engage in browsing before, during, and after the game compared to other cohorts, in line with Billings et al., (8).

H3: Male participants are more likely to engage in browsing before, during, and after the game compared to female participants, in line with Tang and Cooper's (3) study on multi-platform sport consumption across gender and Billings's et al. (8) study on second screening across genders.

Regarding the demographic factors not extensively studied in our analysis, the following research questions are posed:

RQ1: What is the impact of income on the tendency to engage in browsing before, during, and after the game?

RQ2: What is the impact of marital status on the tendency to engage in browsing before, during, and after the game?

While the choice of the above demographic factors is in tandem with the main demographic measures in former studies of second-screeners (8) and reflects the traditional main demographic influencers examined in studies of second screening (5, 8, 33), the inclusion of marital status as a factor influencing browsing during sport games is unique to our analysis. The final section of the literature review will examine studies on the relevance of marital status in the context of sports to provide a better explanation for our decision to include this aspect.

## Marital status and sport engagement

Studies examining the effect of marriage on fitness engagement have produced mixed results. Alexandris and Carroll (36), Lee and Bhargava (37), and Bae (38) found varying outcomes in their investigations. However, a longitudinal study spanning from 1987 to 2005, which involved 8,871 adults, revealed that transitioning from singlehood to marriage was associated with an increase in fitness among women, while divorce and remarriage were linked to an increase in fitness among men (10). Conversely, a study of 3,075 adults discovered that married participants were more likely to engage in exercise compared to non-married individuals (39).

Similarly, studies investigating the effects of extreme sport challenges on married vs. non-married participants have yielded mixed results. A study of married vs. non-married ultramarathoners by Malchrowicz-Moško and Waśkiewicz (12) found that while the challenge proved beneficial for the lives of single participants, the results were inconclusive for married participants. Additionally, a study examining the impact of marital status on the motivations of amateur marathon runners did not identify significant differences in any of the measured dimensions (40).

Regarding the impact of marital status on Tv viewing time, studies have provided more conclusive findings. Divorced, separated, and never-married adults were found to spend significantly more time watching television than married individuals, as the latter were often occupied with family-related activities (41). Furthermore, a study conducted in 2022 with a sample of 561,837 individuals found that married adults were significantly less likely to watch television for more than three hours per day compared to singles (42). Similar findings were found regarding social media (43).

Based on the above literature, our third hypothesis is proposed as follows:

H4: Married participants are less likely to consume sports via multiple platforms and engage in second screening compared to divorced and single participants.

This hypothesis is grounded in the notion that married individuals may have different priorities and responsibilities that could limit their engagement with multiple platforms and second screening during sport consumption.

## Methodology

The present study obtained ethical approval from the University Research Ethics Committee (IRB) at the first author's university in Israel. A web-based survey was used as the data collection method and was distributed among undergraduate students, as well as master's and doctoral students, enrolled in the School of Communication at a private university. Participants were encouraged to extend the distribution of the survey to their acquaintances, family members, and friends. Furthermore, data were collected via a web-based survey, which was posted on the homepages of the 3 leading sports podcasts in Israel: The Podium, Any given day, The angel.

The survey was conducted during the 2022 World Cup, specifically in November of that year, and gathered responses from a total of 272 individuals. Once the convenience sample reached 272 participants, the survey was withdrawn from the podcast homepages mentioned earlier. Participation in the survey was voluntary, and respondents were informed that their contributions would be used for statistical analysis within the framework of an academic research endeavor. Anonymity was assured, and participants were explicitly informed that their responses and decision to answer all or only a subset of the survey questions would have no implications. Participants were also notified that no incentives would be offered for their involvement and were required to acknowledge their comprehension of the terms and express agreement before proceeding with the survey. The researchers' identities, the academic institution overseeing the study, and contact information regarding the survey and collected data were disclosed.

The convenience sample consisted of 272 participants, with 43% male ( $M_{age} = 31.83$ ,  $SD = 13.14$ ). Regarding education, 34% had a high school education, 4% had some vocational studies, 38% held a BA, and 24% had a MA or PhD. Based on data from the Central Bureau of Statistics (CBS), the sampling error was  $\pm 5.95\%$ . Distribution of gender and age was similar to CBS data with respect to the sampling error.

The survey questionnaire included approximately 46 items related to the consumption of World Cup matches across different platforms, the extent of consumption, and reasons for such consumption.

**Measures:** The dependent variables were "Consumption of sports on different platforms" and "Consumption of sports during World Cup games." Participants responded on a Likert scale from 1 (not at all) to 5 (very much) regarding their usage of various platforms, including newspapers, news websites, sport websites, sport TV shows, Mondial shows, podcasts, social media, and radio. The measure of simultaneous consumption of sports content assessed participants' engagement on a scale from 1 (not at all) to 5 (very much) with activities such as watching games

while browsing social networks, reading online commentary, corresponding with friends, working on the computer, working without distractions, and watching without distractions. The independent variables included gender, age, education, family status, and socio-economic status (See [Appendix 1](#)).

## Findings

**Descriptive statistics:** Descriptive statistics provided comprehensive demographic information about the research population, including variables such as age, gender, place of residence, education, and marital status. The results indicated that the majority of the sample population consisted of females (57%) and males (43%). The largest age group was 18–24 (43%), followed by 25–34 (27%) and 35–44 (13%). Most participants resided in the central region of the country (82%). In terms of education, the largest group held an academic degree (38%). The majority identified themselves as secular (84%). Regarding marital status, the most common status was single (52%). Data analysis showed that most participants earned an income close to or below the average (54%), while only 34% earned significantly above the average.

The survey included three key variables: "Consumption of sports on different platforms," "Consumption of sports during World Cup games," and "Simultaneous consumption of sports content." Each variable was computed as the average of its constituent questions. The average score for "Consumption of sports on different platforms" was 2.00 ( $SD = 0.95$ ), indicating a moderate level of consumption. The average score for "Consumption of sports during World Cup games" was 1.97 ( $SD = 0.93$ ), also indicating a moderate level of consumption. Lastly, the average score for "Simultaneous consumption of sports content" was 2.09 ( $SD = 0.99$ ), suggesting a moderate level of engagement in simultaneous activities while consuming sports content.

In order to examine whether there are differences in simultaneous consumption of sports content among different age groups, an ANOVA test was conducted. The results indicated a significant difference among the age groups [ $F(6, 262) = 7.416$ ,  $p < 0.001$ ]. Specifically, participants in the 18–24 age group exhibited the lowest average level of simultaneous consumption of sports content ( $M = 1.71$ ,  $SD = 0.95$ ), while individuals in the 35–44 age group demonstrated the highest average level ( $M = 2.78$ ,  $SD = 0.62$ ). (See, [Table 1](#)).

## Testing for significant differences of the research variables according to family status

In order to examine whether there are differences in sports consumption across different family statuses on various platforms, an independent samples *t*-test was conducted. The results revealed that sports consumption across different platforms among single/divorced individuals ( $M = 2.25$ ,  $SD = 0.93$ ) was significantly higher than among married individuals ( $M = 1.70$ ,  $SD = 0.91$ ). The *t*-test analysis yielded a significant

TABLE 1 The variable, consumption of sports during world cup matches.

Descriptives									
		<i>N</i>	Mean	Std. deviation	Std. error	95% confidence interval for mean		Minimum	Maximum
						Lower bound	Upper bound		
Simultaneous consumption of sports content	Under then 18	1	2.67					3	3
	18–24	114	1.71	0.95	0.09	1.54	1.89	1	5
	25–34	74	2.23	1.05	0.12	1.98	2.47	1	5
	35–44	35	2.78	0.62	0.11	2.56	2.99	1	4
	45–54	24	2.45	0.80	0.16	2.11	2.79	1	4
	55–64	12	2.06	0.86	0.25	1.51	2.60	1	4
	Up then 65	9	2.07	0.67	0.22	1.56	2.59	2	4
	Total	269	2.09	0.98	0.06	1.97	2.21	1	5

ANOVA						
		Sum of squares	df	Mean square	<i>F</i>	Sig.
Simultaneous consumption of sports content	Between Groups	37.656	6.00	6.276	7.416	0.000
	Within Groups	221.730	262.00	0.846		
	Total	259.386	268.00			

ANOVA Test. Dependent Variable: Simultaneous consumption of sports content. Independent Variable: Age groups.

*t*-value of  $-4.913$  ( $df = 273$ ,  $p < 0.001$ ), indicating a substantial difference between the two groups. (See, Table 2).

To examine whether there are differences in sports consumption during the World Cup games based on family status, an independent samples-test was conducted. The results revealed that sports consumption during world cup matches among single/divorced individuals ( $M = 2.21$ ,  $SD = 0.91$ ) was significantly higher than among married individuals ( $M = 1.68$ ,  $SD = 0.87$ ). The *t*-test analysis yielded a significant *t*-value of  $-4.887$  ( $df = 272$ ,  $p < 0.001$ ), indicating a substantial difference between the two groups. (See, Table 3).

In order to examine whether there are differences in simultaneous consumption of sports during the World Cup

matches based on family status, an independent samples *t*-test was conducted. The results revealed that simultaneous consumption of sports during the World Cup among single/divorced individuals ( $M = 2.32$ ,  $SD = 0.96$ ) was significantly higher than among married individuals ( $M = 1.84$ ,  $SD = 0.97$ ). The *t*-test analysis yielded a significant *t*-value of  $-3.924$  ( $df = 270$ ,  $p < 0.001$ ), indicating a substantial difference between the two groups. (See, Table 4).

In order to examine whether there are differences in viewing behavior during a game based on family status, an independent samples *t*-test was conducted. The results revealed that viewing behavior, (“watching with one friend” to “watching with a group of friends”), during a game among married individuals ( $M = 1.93$ ,

TABLE 2 Variable, “sports consumption on different platforms”.

Married		<i>N</i>	Mean	Std. deviation	Std. error mean
Sports consumption on different platforms	married	125	1.7056	0.90576	0.08101
	single	150	2.2513	0.92664	0.07566

Independent samples test									
		Levene's test for equality of variances		<i>t</i> -test for equality of means					
		<i>F</i>	Sig.	<i>t</i>	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% confidence interval of the difference
									Lower Upper
Sports consumption on different platforms	Equal variances assumed	0.219	0.640	$-4.913$	273	$p < 0.01$	$-0.54573$	0.11108	$-0.76441$ $-0.32704$
	Equal variances not assumed			$-4.923$	266.143	$p < 0.01$	$-0.54573$	0.11085	$-0.76398$ $-0.32747$

Independent *T* Test. Dependent Variable: Sports consumption across different platforms. Independent Variable: Family Status.

TABLE 3 Variable: “sports consumption during world cup matches”.

Group statistics										
married			N		Mean		Std. deviation		Std. error mean	
Sports consumption during world cup matches	married		125		1.6843		0.86764		0.07760	
	single/divorced		149		2.2139		0.91457		0.07492	

Independent samples test										
		Levene's test for equality of variances		t-test for equality of means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% Confidence interval of the difference	
									Lower	Upper
Sports consumption during world cup matches	Equal variances assumed	0.064	0.801	−4.887	272	$p < 0.01$	−0.52961	0.10837	−0.74296	−0.31625
	Equal variances not assumed			−4.910	267.891	$p < 0.01$	−0.52961	0.10787	−0.74199	−0.31722

TABLE 5 The variable “game viewing”.

Group statistics										
Married		N		Mean		Std. deviation		Std. error mean		
Game viewing	married	117		1.93		0.944		0.087		
	single/divorced	144		1.28		1.000		0.083		
Independent samples test										
		Levene's test for equality of variances		t-test for equality of means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% Confidence interval of the difference	
									Lower	Upper
Game viewing	Equal variances assumed	5.867	0.016	5.387	259	$p < 0.01$	0.654	0.121	0.415	0.893
	Equal variances not assumed			5.418	253.150	$p < 0.01$	0.654	0.121	0.416	0.891

TABLE 6 Variable “sports consumption on different platforms”.

		N	Mean	Std. deviation	Std. error	95% Confidence interval for mean		Minimum	Maximum
						Lower bound	Upper bound		
Sports consumption on different platforms	Below average	66	1.76	0.93	0.11486	1.5330	1.9918	1.00	4.33
	Slightly below average	82	1.74	0.98	0.10791	1.5246	1.9540	1.00	4.58
	Average	32	1.91	0.80	0.14067	1.6250	2.1988	1.00	3.83
	Slightly above average	42	2.57	0.89	0.13729	2.2907	2.8452	1.00	4.42
	Well above average	53	2.32	0.83	0.11342	2.0916	2.5468	1.00	4.00
	Total	275	2.00	0.96	0.05760	1.8899	2.1166	1.00	4.58
ANOVA									
		Sum of squares			df	Mean square		F	Sig.
Sports consumption on different platforms	Between Groups	28.493			4	7.123		8.684	0.000
	Within Groups	221.482			270	0.820			
	Total	249.976			274				

ANOVA Test. Dependent Variable: Sports consumption on different platforms. Independent Variable: Income Level.

TABLE 7 The variable, *consumption of sports during world cup matches*.

		N	Mean	Std. deviation	Std. error	95% Confidence interval for mean		Minimum	Maximum
						Lower bound	Upper bound		
Consumption of sports during world cup matches	Below average	65	1.70	0.85	0.10602	1.4864	1.9101	1.00	4.17
	Slightly below average	82	1.76	0.97	0.10683	1.5464	1.9716	1.00	4.75
	Average	32	1.92	0.81	0.14393	1.6263	2.2133	1.00	3.92
	Slightly above average	42	2.48	0.87	0.13477	2.2078	2.7521	1.00	4.36
	Well above average	53	2.27	0.85	0.11689	2.0332	2.5023	1.00	4.00
	Total	274	1.97	0.93	0.05619	1.8617	2.0829	1.00	4.75
ANOVA									
		Sum of squares			df	Mean square		F	Sig.
Consumption of sports during world cup matches	Between Groups	24.151			4	6.038		7.659	0.000
	Within Groups	212.056			269	0.788			
	Total	236.207			273				

ANOVA Test. Dependent Variable: consumption of sports during World Cup matches. Independent Variable: Income Level.

gender, an independent samples *t*-test was conducted. The results revealed that sports consumption across different platforms among males ( $M = 2.60$ ,  $SD = 0.84$ ) was significantly higher than among females ( $M = 1.49$ ,  $SD = 0.66$ ). The *t*-test analysis yielded a significant *t*-value of 11.720 ( $df = 210.302$ ,  $p < 0.001$ ), indicating a substantial difference between the two groups. (See, Table 13).

To investigate whether there are differences in parallel sports content consumption based on gender, an independent samples *t*-test was conducted. The results revealed no significant differences in sports consumption across different platforms between males and females.

## Discussion and conclusions

The present study aimed to examine the use of multi-platform and second-screen consumption during sport events and understand the demographics behind these trends. The analysis revealed several interesting findings, with the most notable being the tendency for marriage to reduce the likelihood of browsing before, during, and after games. Single and divorced participants showed a significantly higher inclination to consume information from multiple platforms before and after games, moreover single and divorced participants were more likely to engage in second-screening during games. In contrast, married participants

TABLE 8 Variable: “simultaneous sports content consumption”.

		N	Mean	Std. deviation	Std. error	95% Confidence interval for mean		Minimum	Maximum
						Lower bound	Upper bound		
Simultaneous sports content consumption	Below average	63	1.78	1.00	0.12608	1.5310	2.0351	1.00	4.67
	Slightly below average	82	1.93	1.03	0.11330	1.7087	2.1596	1.00	4.67
	Average	32	1.95	0.87	0.15396	1.6391	2.2671	1.00	3.83
	Slightly above average	42	2.67	0.78	0.11968	2.4250	2.9084	1.00	4.00
	Well above average	53	2.34	0.93	0.12758	2.0868	2.5988	1.00	4.50
	Total	272	2.09	0.99	0.06010	1.9758	2.2124	1.00	4.67

ANOVA						
		Sum of squares		df	Mean square	Sig.
Simultaneous sports content consumption	Between Groups	24.151		4	6.038	0.000
	Within Groups	212.056		269	0.788	
	Total	236.207		273		

ANOVA Test. Dependent Variable: Simultaneous Sports Content Consumption. Independent Variable: Income Level.

TABLE 9 Variable, sports consumption on different platforms.

		N	Mean	Std. deviation	Std. error	95% Confidence interval for mean		Minimum	Maximum
						Lower bound	Upper bound		
Sports consumption on different platforms	HI SCHOLL	95	1.63	0.92	0.09398	1.4473	1.8205	1.00	4.58
	Post intuition	11	2.02	0.82	0.24776	1.4645	2.5686	1.00	3.17
	Academic	105	1.95	0.95	0.09231	1.7702	2.1363	1.00	4.50
	Master's-PhD	65	2.63	0.72	0.08895	2.4490	2.8044	1.00	4.42
	Total	276	2.00	0.95	0.05740	1.8914	2.1174	1.00	4.58

ANOVA						
		Sum of squares		df	Mean square	Sig.
Sports consumption on different platforms	Between Groups	38.487		3	12.829	0.000
	Within Groups	211.597		272	0.778	
	Total	250.084		275		

ANOVA Test. Dependent Variable: sports consumption on different platforms. Independent Variable: Educational Level.

exhibited the lowest levels of both multi-platform browsing and second-screening.

One possible explanation for these findings is that the survey found that married individuals often watch games in the company of others, whereas single and divorced individuals, who tend to consume a variety of media, including television and social media, have more time and inclination to browse before, during, and after sport games. Further, it sits with the tendency of married individuals to reduce engagement with physical sport and sport viewership vs. single and divorced adults’ tendency to spend a lot more time than married watching television (42). Future studies could explore the role of boredom, spare time, and attempts to alleviate loneliness in the browsing habits of

divorced and single individuals, as previous research has linked these factors to higher levels of loneliness and spare time in comparison to married adults.

Another noteworthy finding was that young adults were less likely than other age groups to engage in second-screening. Interestingly, young adults reported watching the games more often with friends or in public places. This finding supports a previous study conducted in Israel, which also highlighted the high tendency of Israelis to watch games together, emphasizing the importance of cultural factors and a sense of togetherness in the use of devices beyond television during games (35); see also (44). While distraction has been identified as a major motivation for second-screening (8), the presence of people around young

TABLE 10 The variable, *consumption of sports during world cup matches*.

		N	Mean	Std. deviation	Std. error	95% Confidence interval for mean		Minimum	Maximum
						Lower bound	Upper bound		
Consumption of sports during world cup matches	HI SCHOLL	95	1.60	0.87	0.08935	1.4191	1.7739	1.00	4.75
	Post intuition	11	1.93	0.71	0.21523	1.4543	2.4135	1.00	2.83
	Academic	105	1.97	0.93	0.09109	1.7873	2.1486	1.00	4.25
	Master's-PhD	64	2.54	0.74	0.09310	2.3568	2.7289	1.00	4.36
	Total	275	1.97	0.93	0.05599	1.8618	2.0823	1.00	4.75

ANOVA						
		Sum of squares		df	Mean square	Sig.
Consumption of sports during world cup matches	Between Groups	34.270		3	11.423	0.000
	Within Groups	201.941		271	0.745	
	Total	236.211		274		

ANOVA Test. Dependent Variable: consumption of sports during World Cup matches. Independent Variable: Educational Level.

TABLE 11 Variable: “simultaneous sports content consumption”.

		N	Mean	Std. deviation	Std. error	95% Confidence interval for mean		Minimum	Maximum
						Lower bound	Upper bound		
Simultaneous sports content consumption	HI SCHOLL	95	1.72	0.97	0.09938	1.5237	1.9184	1.00	4.67
	Post intuition	11	1.92	0.81	0.24450	1.3795	2.4690	1.00	3.33
	Academic	103	2.15	1.04	0.10293	1.9441	2.3524	1.00	4.50
	Master's-PhD	64	2.58	0.70	0.08800	2.4075	2.7592	1.00	4.00
	Total	273	2.09	0.99	0.05990	1.9746	2.2105	1.00	4.67

ANOVA						
		Sum of squares		df	Mean square	Sig.
Simultaneous sports content consumption	Between Groups	29.157		3	9.719	0.000
	Within Groups	237.295		269	0.882	
	Total	266.453		272		

ANOVA Test. Dependent Simultaneous Sports Content Consumption. Independent Variable: Educational Level.

adult Israelis may reduce the need for distraction, providing a possible explanation for this unique result. Future studies should further explore the interplay between culture and the tendency to browse for information during sport games to gain a better understanding of their relationship.

The study’s other results align with existing literature. men reported higher levels of browsing before and after games compared to female participants, although no significant differences were found in reported levels of second-screening during games. These findings are consistent with previous research, which has shown mixed results regarding gender differences in multi-platform and second-screen usage during sports events (3, 8). Additionally, the study found a positive

association between higher education and the propensity to browse around games, aligning with previous research on the profile of second-screen users and the link between education and interest in sports information (8, 35). Similarly, while there are no specific studies on the interplay between income and second-screening, the study identified a higher tendency for individuals with higher income to engage in browsing before, during, and after games (45, 46). These findings align with wider literature linking sports engagement and income (Ibid.).

Overall, the study paints a profile of a typical second-screener who also engages in browsing before and after games as a non-married older male with higher income and education.

TABLE 12 Variable, sports consumption on different platforms.

Group statistics										
Gender				<i>N</i>		Mean	Std. deviation	Std. error mean		
Sports consumption on different platforms		Male		116		2.67	0.87	0.081		
		Female		156		1.48	0.65	0.052		
Independent samples test										
		Levene's test for equality of variances		<i>t</i> -test for equality of means						
				<i>F</i>	Sig.	<i>t</i>	df	Sig. (2-tailed)	Mean difference	Std. error difference
										Lower
Sports consumption on different platforms	Equal variances assumed	15.202	0.000	12.881	270	<i>p</i> < 0.01	1.185	0.092	1.004	1.366
	Equal variances not assumed			12.356	204.490	<i>p</i> < 0.01	1.185	0.096	0.996	1.374

Independent T Test. Dependent Variable: sports consumption on different platforms. Independent Variable: Gender.

TABLE 13 The variable, sports consumption during the world cup matches.

Group statistics											
Gender				<i>N</i>	Mean	Std. deviation		Std. error mean			
Sports consumption during the world cup matches		Male		115	2.60	0.84		0.078			
		Female		156	1.49	0.66		0.053			
Independent samples test											
		Levene's test for equality of variances		t-test for equality of means							
				<i>F</i>	Sig.	<i>t</i>	df	Significance		Mean difference	Std. error difference
		One-sided <i>p</i>	Two-sided <i>p</i>					Lower	Upper		
Sports consumption during the world cup matches	Equal variances assumed	11.052	0.001	12.139	269	<i>p</i> < 0.01	<i>p</i> < 0.01	1.111	0.092	0.931	1.291
	Equal variances not assumed			11.720	210.302	<i>p</i> < 0.01	<i>p</i> < 0.01	1.111	0.095	0.924	1.298

Independent *T* Test. Dependent Variable: sports consumption during the World Cup matches. Independent Variable: Gender.

It is likely that individuals with this profile have more spare time, experience boredom and loneliness, and have an interest in sports data that aligns with their education and income (8, 35, 46, 47).

Furthermore, the findings indicate that individuals with higher educational attainment and higher income levels demonstrate a propensity to actively seek information before, during, and after engaging in sports games. These findings align with existing research on information consumption and the consumption of in-depth content via podcast platforms (8, 45), suggesting that individuals with higher education and income have a greater

inclination to consume information in various contexts, including sports games.

In conclusion, this study provides valuable insights into the demographics of multi-platform and second-screen usage during sport events. The findings suggest that marital status, age, gender, education, and income are important factors influencing these consumption behaviors. Divorced and single individuals, as well as those with higher education and income, are more likely to engage in multi-platform browsing and second-screening during sport games. Young adults, on the

other hand, tend to watch games with friends or in public places, which may reduce their need for second-screen engagement. The results make a unique contribution to existing studies as they are the first to highlight the importance of marital status in the tendency to use a second screen during sport games. Whereas so far this aspect was mostly ignored in second screen studies, our analysis indicates that it is more important than other components which were indicated in former studies, such as the young adults age group. One possible explanation might be the Israeli culture where a sense of togetherness encourages watching games together and as noted above, we hope that future comparative studies will address this issue. These findings contribute to a better understanding of the motivations and characteristics of individuals who enhance their sport viewership experience through the use of multiple devices and platforms.

It is important to note that the study has certain limitations, such as the use of a convenience sample and the potential for sampling bias. Convenience sampling offers rapid data collection, ease of access, and practical feasibility, making it particularly advantageous for quick insights and exploratory research. However, it is important to acknowledge that convenience sampling may introduce bias which should be considered when interpreting findings. The sample primarily consisted of MA and BA students from a school of communication and sports podcast consumers, resulting in an overrepresentation of female participants (57%) and the 18–24 age group (43%), thereby limiting the external validity of the findings.

Future research should aim to address these limitations by employing more representative samples and exploring additional factors that may influence multi-platform and second-screen consumption during sport events. Nonetheless, this study provides valuable insights into the changing nature of television viewership and the increasing prevalence of multi-platform and second-screen engagement in the context of sport games.

## Data availability statement

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

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## Ethics statement

The studies involving humans were approved by Reichman University RIB 23-074. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

## Author contributions

YG: Conceptualization, Data curation, Methodology, Supervision, Validation, Writing – review & editing. TS-A: Data curation, Formal Analysis, Project administration, Visualization, Writing – original draft, Writing – review & editing. TL: Methodology, Project administration, Software, Visualization, Writing – review & editing.

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# Appendix

## Appendix 1 - Survey questions

How do you define your gender identity?

- Male
- Female

Place of residence:

- North
- Central
- South
- Other

Education:

- High school
- Post-high school
- Academic
- Second or third degree

Religious affiliation:

- Secular
- Traditional
- Religious
- Ultra-Orthodox

Marital status:

- Single
- Married or in a relationship
- Divorced
- Widowed

Extremely	Very	Moderately	Slightly	Not at all
Read sports sections in newspapers				
Keep up with sports news websites				
Browse dedicated sports websites				
Watch live sports broadcasts on television				
Watch sports programs on television (e.g., sports news)				
Listen to sports podcasts in Hebrew				
Listen to sports podcasts in a foreign language				
Watch sports content on YouTube or similar platforms				
Keeps up with sports content on social media networks				
Listen to sports programs on the radio				
Follow on Twitter (but doesn't watch)				
Follow on TikTok (but doesn't watch)				

The average income per person in a household is 9,000 NIS gross per month. How is your income in compare?

- Much below average
- Below average
- Average
- Slightly above average
- Much above average

Extremely	Very	Moderately	Slightly	Not at all
Read sports sections in newspapers				
Keep up with sports news websites				
Browse dedicated sports websites				
Watch live sports broadcasts on television				
Watch sports programs on television (e.g., sports news)				
Listen to sports podcasts in Hebrew				
Listen to sports podcasts in a foreign language				
Watch sports content on YouTube or similar platforms				
Keeps up with sports content on social media networks				
Listen to sports programs on the radio				
Follow on Twitter (but doesn't watch)				
Follow on TikTok (but doesn't watch)				

Please specify the extent to which you consume sports content on the following platforms:

Please specify the extent to which you consume sports content during World Cup games (November–December 2022) on the following platforms:

Please specify to what extent you simultaneously integrate World Cup content across the following platforms:

How many hours do you dedicate to watching World Cup games?.

- Less than an hour per day (prefer to watch daily summaries).
- Between one to two hours.
- Between three to five hours.
- More than five hours.
- More than seven hours.

Preferred viewing arrangement:

- I prefer to watch alone.
- I watch with one friend.
- I watch with a group of friends.
- Prefer to go to a place with communal viewing (pub, park, etc.).

Extremely	Very	Moderately	Slightly	Not at all
I watch the game and browse social media				
I watch the games and only read online commentary.				
I watch the games and chat with friends.				
I watch the games while working on the computer.				
I watch the games without any distractions.				
I follow the game online while working				



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# Creative webs: decoding the creativity potential of Twitter followers

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**Introduction:** Previous studies have associated creativity to one's social networks. This study builds on this framework and examines the premise that one's social fabric is a catalyst for creativity, specifically probing the dynamics between online social connections and creative expressions in the realm of Esports. Therefore, this research paper examined a correlation between people's creativity and their Effective Network Size (non-redundant ties) on Twitter, to see if potentially non-redundant information is related to creativity.

**Methods:** Creativity score was defined as the propensity of a participant to utilize specific terms relating to Esports in its emerging stages, prior to its peak popularity as evidenced by Google Trends. Effective Network Size was analyzed based on the social ties of participants on Twitter ( $N = 50,000$ ).

**Results:** The findings indicate that the higher the Effective Network Size score, the higher the creativity score. Furthermore, geographically dispersed social networks moderated the relationship between Effective Network Size and creativity. For people with more dispersed social networks, ENS was more constructive for creativity.

**Discussion:** These findings are discussed in the broader context of the relevancy of online social networking sites for creativity.

## KEYWORDS

creativity, social network analysis, Esports, trends, Twitter

## 1 Introduction

Creativity is a pivotal asset, serving both individuals in tasks like problem-solving and society at large by driving scientific discoveries, artistic movements, inventions, and economic advancements (Sternberg and Lubart, 1999). Historically, creativity was often explored in relation to other personal traits (Barron and Harrington, 1981). Yet, over time, the focus expanded to encompass the role of social factors in fostering creativity. Research suggests that social interactions significantly shape the creative process (Perry-Smith and Shalley, 2003). Burt (2004) posited that individuals with diverse social networks are more likely to access unique information, thereby transforming creativity into a dynamic exchange of ideas.

While prior studies have delved into the link between face-to-face social networks and creativity (Perry-Smith, 2006; Zhou et al., 2009) or the relationship between online social networks and social capital (Hofer and Aubert, 2013; Hayat et al., 2017a), our research pioneers the exploration of the association between online social networks, specifically Twitter, and creativity. Twitter, a platform where users can freely connect, offers an environment conducive to expanding non-redundant social ties, potentially exposing users to a diverse array of information and, in turn, bolstering creativity (Kwak et al., 2010). Utilizing a custom script, we gathered data on participants' Twitter connections, calculating a non-redundant ties score

for each (i.e., a user's number of friends that are not connected among themselves). We then assessed the participants' creativity by looking at how early they mentioned trending ideas in their tweets (compared to when these ideas peaked). Our findings indicate a positive correlation between non-redundant ties and creativity scores.

This research underscores the significance of online social networking sites, not just in the realm of social capital but also in the domain of creativity. By leveraging Twitter, we have illuminated social mechanisms previously not examined in traditional studies.

## 2 Related work

### 2.1 Creativity

In a foundational work, Amabile (1983, p. 359–360) defines creativity as:

“A product or response is deemed creative when independent observers concur on its creativity. Such a product or response is judged creative if (a) it presents a novel yet appropriate, useful, correct, or valuable solution to the given task, and (b) the task is heuristic in nature rather than algorithmic.”

Creativity, can further be defined as the capacity to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others. Furthermore, recognizing the value of new information, assimilating it, and communicating it requires a blend of creativity and adaptability (Cohen and Levinthal, 1990). The Absorptive Capacity Theory, proposed by Cohen and Levinthal (1990), posits that individual's ability to recognize the value of new information, assimilate it, and apply it to commercial or creative ends is pivotal for innovation. Specifically, the act of identifying and discussing trending topics requires a similar process. The recognition of a trending topic among a vast array of information demands a keen sense of what is relevant and potentially valuable. This discernment is akin to the first step in the absorptive capacity – the ability to recognize and value new information. Secondly, assimilating this information involves understanding the context and nuances of the trend, which is critical for meaningful engagement. Lastly, creatively applying or discussing these trends can be seen as the third step, where individuals adapt this information in unique ways, be it through insightful comments, creative hashtags, or linking trends to other concepts. This process demonstrates creativity, as it involves not just the consumption of information but its novel application in a dynamic social media environment. Hence, following previous work, we will look at the individuals' references to trending topics as a mean to gain insight into creativity (Ceh et al., 2023).

Historically, the research spotlight was on the personality traits (or human capital) linked with creativity (Barron and Harrington, 1981). Over time, the lens broadened to encompass social factors that bolster creativity, emphasizing the role of social interactions in shaping the creative process (Perry-Smith and Shalley, 2003). The benefits accrued from being part of a social network are encapsulated in the term ‘social capital’ (Bourdieu, 1986). Social capital offers insights into how social ties can enhance creativity by introducing individuals to a diverse range of perspectives (Perry-Smith, 2006). It also underscores the potency of structural holes in delivering non-redundant

information (Burt, 1992). A structural hole is characterized by a scenario where an individual (ego) is directly linked to two other individuals (alters) who aren't connected to each other. Such a configuration ensures that the ego receives unique information (Burt, 1992). This concept is pivotal to our study as we delve into the nexus between individuals' online social networks, their creativity, and the social capital emanating from their varied online connections.

### 2.2 Social networks

A social network is characterized as a collection of individuals (or organizations or other social entities) linked by various social relationships, such as friendship, collaboration, or information exchange (Garton et al., 1997). Expanding on this, it can be described as a framework comprising actors (nodes) and their interrelationships (links) within a societal context (Wasserman and Faust, 1994, as cited in Chung et al., 2016). Two primary analytical approaches exist: whole network analysis, which examines ties across all network members (Wellman, 2007), and ego network analysis. The latter delves into relationships from the vantage point of a specific node, termed the ‘ego’—in our context, this refers to a particular Twitter user perspective.

Social network analysis emphasizes structural evaluation, where the primary unit of study is the relationship itself (Garton et al., 1997). This method seeks to map and quantify various relationships—be they formal, informal, weak, or strong—to scrutinize information flows (Serrat, 2017) or resource exchanges, and to discern the distinct impacts such networks exert on individuals or entities (Garton et al., 1997). Resources garnered from these networks, often termed social capital, encompass valuable information, personal relationships, and the capacity to mobilize groups (Paxton, 1999). To truly grasp the interplay between social networks and creativity, it's imperative to understand the relationship between social networks and social capital.

### 2.3 Social capital

Social capital represents the anticipated benefits derived from social relationships (Coleman, 1988). Essentially, it encapsulates the advantages one gains from being part of a social network (Bourdieu, 1986). Illustratively, Coleman (1988) highlighted how the tight-knit relationships among Jewish diamond merchants in New York, fortified by practices like intermarriage, fostered a trust so profound that diamonds could be exchanged without formalities or fears of theft.

Wellman (2001), suggest that social capital can also be cultivated through online interactions. For instance, Hayat et al. (2017b) revealed that online social ties can offset limited eHealth literacy. By connecting with users facing similar health challenges, participants, especially those from ethnic minorities, reported enhanced perceived health outcomes.

Broadly, social capital bifurcates into bonding and bridging capital. Bonding capital emerges from strong, intimate connections within socially cohesive groups, like families or close friends. In contrast, bridging capital arises from weaker ties within socially diverse groups, such as colleagues or business associates (Putnam, 2000; Adler and Kwon, 2002; Ferlander, 2007). This research differentiates between bridging capital, formed from a mix of weak and diverse ties, and mere weak ties. This distinction is pivotal as our focus is on tie diversity rather than strength.

Bridging capital's strength lies in its potential to introduce new information via diverse contacts (Putnam, 2000). For instance, job seekers often benefit more from weak social connections, which can unveil opportunities beyond their immediate circles (Granovetter, 1977). Conversely, bonding capital offers emotional sustenance, like the support one receives from close friends during challenging times.

Perry-Smith and Shalley (2003) posited that weak ties, by introducing diverse information and viewpoints, can enhance creativity. While not all information from weak ties is inherently creative, it's often novel and less redundant, thus potentially sparking creativity (Perry-Smith, 2006). Zhou et al. (2009) identified a nuanced relationship between weak ties and creativity, noting optimal creativity when employees maintained a moderate number of weak ties. Interestingly, they did not observe a direct negative correlation between strong ties and creativity. They hypothesized that while strong ties offer trust and support, fostering creativity, they might also limit diverse perspectives due to homophily (Obstfeld, 2005), potentially constraining creative thought.

Perry-Smith (2006) further emphasized the role of weak ties in fostering creativity among scientists, though this relationship was mediated by background diversity. This finding was replicating more recently (Hayat et al., 2020, 2021). In summary, weak ties emerge as a significant catalyst in nurturing creativity.

## 2.4 Online bridging social capital on Twitter diversified social networks

Kwak et al. (2010) note that Twitter's structure allows users to freely follow profiles without the obligation of reciprocation. This dynamic facilitates rapid expansion of users' social networks, potentially augmenting their social capital (Hofer and Aubert, 2013). Such a unique friendship model positions this study to probe into the non-redundant relationships of Twitter users.

Hofer and Aubert (2013) observed a correlation between the number of profiles a user follows on Twitter and their online bridging social capital. Essentially, a broader following spectrum offers users a richer tapestry of opinions on their feeds. More recent research ranks Twitter users as having the highest bridging social capital, followed by those on Instagram, Facebook, and Snapchat (Phua et al., 2017). This ranking aligns with Twitter's inherent design, which encourages users to connect with individuals beyond their immediate real-life circles. The platform's diverse weak ties can catalyze the dissemination of novel information (Jin and Phua, 2014) and foster interactions with a broader audience (Williams, 2006).

## 2.5 Diversified social networks

While it's acknowledged that not all weak ties bridge distinct social spheres and not all strong ties are intrinsically interconnected (Zhou et al., 2009), Burt (1992) offered a counterpoint to the 'strength of weak ties' paradigm. He introduced a measure of structural holes, termed Effective Network Size, which quantifies non-redundant ties a central node maintains, irrespective of tie strength.

Studies underscore that information predominantly circulates within groups rather than between them. In this context, structural holes emerge as a competitive edge for those whose connections

traverse these gaps. These holes present opportunities to mediate information flow between groups, each holding valuable insights for the other (Burt, 2017).

Individuals whose networks are replete with structural holes often find themselves better informed, more involved, and in control of diverse opportunities. Their connections across disparate groups ensure a stream of information with minimal redundancy (Burt, 2017).

In the world of entrepreneurship, entrepreneurs bridge the structural holes in their networks via brokers to achieve bridging capital for the success of their projects (Burt, 2005). A manager who spans a structural hole by having relations with contacts on both sides of a hole can obtain crucial information for his/her organization (Burt, 1997) and is more likely to develop good ideas (Burt, 2004).

Burt's (2004) work underscores the value of bridging disparate groups, positing that such connections catalyze the dissemination of innovative ideas, effectively transforming creativity into a cross-pollination enterprise. Additionally, those who act as conduits across 'structural holes' in social networks often reap professional rewards, including enhanced reviews, accelerated career progression, and increased income (Burt, 2000).

Echoing Burt, Anderson's (2008) research corroborates the positive impact of expansive social networks on managers' access to a rich variety of information, as quantified by Effective Network Size. However, Anderson's findings contest the presumed advantage of weak ties for information diversity. This contradicts earlier assumptions and calls into question the singular effectiveness of weak ties, a challenge also reflected in the work of Hansen et al. (2005).

While some scholars have questioned Burt's theories, Perry-Smith and Mannucci (2017) among them, the relationship between structural holes and creativity remains contested. Zhou et al. (2009) found no link between these structural holes and creative output, suggesting that the presence of weak ties and structural holes does not guarantee a diverse information set for the individual. This becomes more complex considering that information from a common network might be redundant, regardless of whether the network contacts are themselves connected.

This complexity is compounded by cultural differences. Xiao and Tsui (2007) observed that in China's collectivist society, the benefits associated with structural holes in Western individualistic cultures do not hold. In these societies, tight-knit networks fostering trust and reciprocity are more valued. Perry-Smith (2006), despite researching an American demographic, also refuted a direct connection between structural holes and creativity, suggesting instead that the advantage lies in the weak ties themselves rather than the information diversity they might offer.

Contrastingly, Anderson (2008) maintains that the value of weak ties lies in their role as bridges across structural holes, following Burt (1992). Yet, when the bridging function is controlled for, Anderson posits that strong ties actually prove more fruitful for information gathering, citing Krackhardt (1992) on their greater tendency to share knowledge willingly.

## 2.6 Diversified social networks online

The impact of diverse social networks is also demonstrated in the online sphere. A recent study has highlighted the importance of one's Effective Network Size in regards to one's content popularity on online

social networks, especially when the content producer is a woman (Lesser et al., 2017).

Furthermore, the person who shares a piece of information within online social networking sites, can influence the perceived credibility of that content (Samuel-Azran and Hayat, 2019). On an aggregated level, high diversity among people who share a given piece of information on Twitter affects recipients' credibility assessment regarding that piece of information such that it is perceived as more credible (Hayat and HersHKovitz, 2018; HersHKovitz and Hayat, 2020), especially among recipients with high digital literacy or high *need for cognition* (Hayat et al., 2019) – a personality trait with high cognitive motivation to gather and process information (Anderson, 2008). Such results are alarming due to the prominent rise of social networking sites as news sources. If information's visual cues are perceived as more important than the information itself, then, now more than ever, 'the medium is the message'.

To conclude, social parameters play a crucial role in facilitating creativity. However, to our knowledge, no researcher has yet examined a relationship between Twitter users' creativity and their Twitter social networks such that the more diversified their Twitter social networks the more creative they are. Therefore, the second hypothesis is:

*H1: Effective Network Size of Twitter users and their creativity are positively correlated.*

## 2.7 Remote social connections, information diversity, and creativity

In his influential analysis, Granovetter (1977) introduced the concept that relationships with acquaintances, or "weak ties," are crucial for accessing a wider array of unique information. These peripheral connections often act as conduits to different social spheres, enhancing the diversity of information one receives. Within the digital era, these weak ties extend beyond physical proximity, enabling the exchange of new ideas across vast geographical divides through online platforms.

As discussed above, Burt (2004) emphasized the concept of "structural holes," where individuals who bridge gaps between different social groups have a competitive advantage in accessing diverse information. This diversity of information is crucial for creativity as it provides a broader perspective and a richer set of resources for idea generation (Perry-Smith, 2006). Remote connections, by their nature, often span across different cultures, industries, and backgrounds, making them a potent source of diverse information.

The rise of digital platforms like LinkedIn, Twitter, and various academic forums has made it easier to establish and maintain remote connections. These platforms not only facilitate information exchange but also foster collaborative projects that span across borders (Aral et al., 2012). Such collaborations often lead to innovative outcomes due to the amalgamation of diverse perspectives. Hence, our second research hypothesis is:

*H2: When the geographical distance between an ego and its alters is higher, Effective Network Size of Twitter users and their*

*creativity are more strongly correlated compared to cases where the geographical distance is lower.*

The context in which the research hypothesis will be examined, is the evolving field of Esports. The realm of Esports has garnered substantial attention in both academic and popular discourse, reflecting its meteoric rise and cultural significance. Esports, or competitive video gaming, has evolved from a niche pastime to a global phenomenon, engaging hundreds of millions of enthusiasts worldwide. This remarkable growth is not merely a trend within the gaming industry but a pivotal shift in entertainment, social interaction, and economic models. Moreover, the study of Esports offers invaluable insights into technological adoption, online community engagement, and gaming psychology, crucial for understanding contemporary digital trends. The interplay between advanced technology and Esports provides a unique perspective on the diffusion of innovation in the digital space.

## 3 Materials and methods

### 3.1 Procedure

The foundational principles of SNA, detailed by Wasserman and Faust (1994), include the interdependence of entities and their relational matrix, the role of ties as conduits for resource exchange, the network's influence as a determinant of individual behaviors, and the persistence of these relational patterns over time. This paper utilizes ego network analysis, which centers on the network from the viewpoint of an individual entity, the 'ego,' encompassing the 'ego,' their direct connections—'alters,'—and the ties among these alters, forming what is also termed neighborhood networks (Hayat and Mo, 2015).

For our study, we gathered data from a subset of geocoded Twitter user pairs linked by 'follow' relationships, focusing on 50,000 users connected to the @IGN handle—a hub in the gaming news arena, indicative of a gaming-interested populace. We cataloged the locations and UI languages of these users, employing a bespoke scraper to mine data via Twitter's streaming API, as per Rossi and Giglietto (2016). This API provides real-time access to tweets and associated metadata. Given the potential for data collection disruptions, we acknowledge, following Bruns and Stieglitz (2013), a margin of error, treating our dataset as an approximate rather than absolute representation of the stated data.

### 3.2 Measures

Geo-location data was harvested from our dataset, capturing the geographical coordinates of each participant and their connections, contingent on their use of GPS-enabled devices. These coordinates were translated into specific countries using the Google Maps Geocoding API, thus locating each participant and their network. Additionally, the API facilitated the measurement of distances in kilometers between participants and their connections.

We computed the Effective Network Size (ENS) for each participant to evaluate the scope of their Twitter-based networks. ENS

TABLE 1 The association between ENS, creativity, and Average Distance.

	Creativity	ENS	Average Distance
Creativity	-	0.46***	0.36***
ENS	-	-	0.09***
Average Distance	-	-	-

Pearson's R coefficients. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

TABLE 2 The interaction between Average Distance and ENS.

	(1) Main effects		(2) Interaction	
	B (SE)	$\beta$	B (SE)	$\beta$
ENS	0.48 (0.01)***	0.16	0.46 (0.01)***	0.13
Average Distance	0.36 (0.01)***	0.12	0.32 (0.01)***	0.09
ENS X Average Distance			0.24 (0.03)***	0.05
Constant	2.87 (0.001)***		2.43 (0.001)***	
N	50,000		50,000	
R <sup>2</sup>	0.13		0.15	

\*\*\* $p < 0.001$ .

quantifies “the number of direct contacts (alters) a focal participant (ego) has, adjusted by the alters’ connections among themselves, reflecting the concept of non-redundancy in social ties” (Burt, 1992 as cited in Lesser et al., 2017, p. 1612). Despite debates on the efficacy of weak ties versus non-redundancy, our methodology adheres to the measures validated by Burt (1992) and Anderson (2008).

The calculation of ENS, which serves as the independent variable in our analysis, was conducted through the UCInet software (Borgatti et al., 2002). ENS is calculated as follows: “Ego  $v_i$ ’s ENS in  $G^s$  is denoted by the equation below, where  $j$  indexes all of those with whom ego  $v_i$  has contact; and  $q$  is every third  $v_q$  individual (other than  $v_i$  or  $v_j$ ). The quantity ( $p_{iq}m_{jq}$ ) inside the brackets is the level of redundancy between a given ego and a particular alter  $v_j$  (Burt, 2009 from Lesser et al., 2017, p. 9).

$$effective\_size(v_i) = \sum_j \left[ 1 - \sum_q p_{iq}m_{jq} \right]$$

In order to calculate the ENS, we have collected the following data for each of our participants: (1) a list of his/her followings (2) a list of the followings of each of the twitter users our participants follow.

Creativity score was defined as the propensity of a participant to utilize a specific hashtag in its emerging stages, prior to its peak popularity as evidenced by Google Trends As discussed above, we focused the topic of Esports, derived from ‘electronic sports’, denotes the structured and competitive realm of video gaming, often involving professional participants and teams adhering to established rules and protocols. These contests span from regional skirmishes to grand international tournaments and are disseminated to vast global audiences via diverse digital mediums. With its burgeoning popularity, Esports not only parallels the ascent of video game culture and technological evolution but also redefines conventional paradigms of sportsmanship, athleticism, and socio-cultural engagement. Specifically, we looked at Google’s 2023 year in search, and examined

the top 5 games ranked in this report,<sup>1</sup> which are: Hogwarts Legacy; The Last of Us; Connections; Battlegrounds Mobile India; and Starfield. The creativity score was calculated based on the distance of when the user tweeted a tweet using one of these terms, and the peak day for that term. Higher score means that that the user tweeted further ahead from when the term reached its virality. This early adoption and utilization are indicative of a user’s ability to foresee, setting them apart from the majority who engage with content once it has gained broader recognition.

## 4 Results

ENS score, and Average Distance were are correlated with creativity score (see Table 1). To investigate how Average Distance moderates the association between ENS score and creativity an OLS regression is estimated (see Table 2), predicting the creativity score. The main independent variables are ENS score, and Average Distance (between the ego and it alters). The model proved to be statistically significant, accounting for 13% of the variation in the creativity scores. Both ENS score (*partial*  $r = 0.48$ ,  $p < 0.001$ ), and Average Distance (*partial*  $r = 0.36$ ,  $p < 0.001$ ) are positive predictors of the creativity score, thus affirming H1 (see Table 2).

The analysis further showed (see Table 2) a notable interaction effect between the Effective Network Size (ENS), and Average Distance (*partial*  $r = 0.24$ ,  $p < 0.001$ ), indicating that the impact of ENS score on creativity is contingent upon the Average Distance (between the ego and it alters); thus, affirming H2.

Simple slopes were tested for the interplay between ENS and creativity, for participants with high average distance, vs. participants with low average distance. For participants with high average distance

<sup>1</sup> <https://trends.google.com/trends/yis/2023/GLOBAL/?hl=en-US>

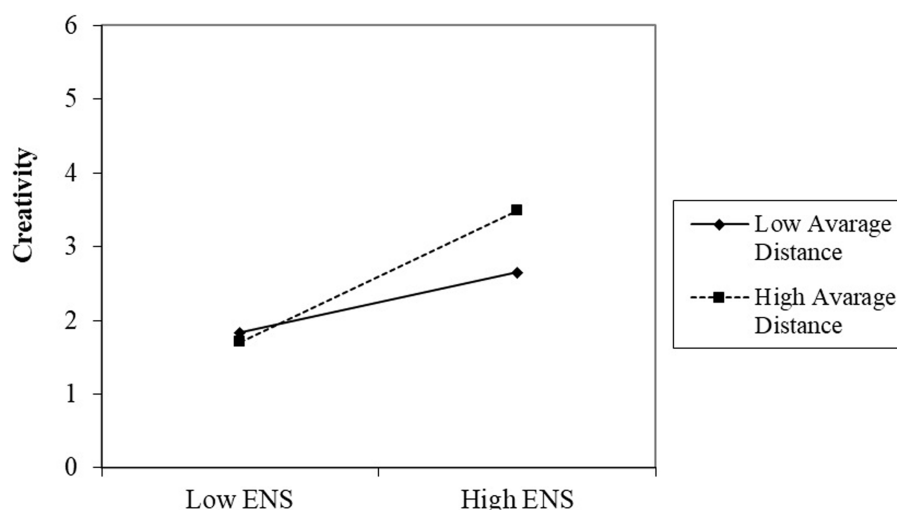


FIGURE 1  
Interaction effect between ENS and average distance.

a stronger correlation between ENS and creativity ( $b = 0.24$ ,  $SEb = 0.03$ ,  $\beta = 0.05$ ,  $p < 0.001$ ) was found, when compared to participants with low average distance. This interaction is depicted in Figure 1. The plotting of this data was conducted following the procedure proposed by Aiken and West (1991), to plot the interaction effects. Specifically, the plot visualizes the distinction between individuals with low average distance, and those with average distance (the cutoff point for dividing individuals into this group was the median distance score).

## 5 Discussion

Prior research has linked social capital and creative output with one's network of social ties, yet there appears to be a gap in the literature concerning the specific impact of online social networks on creativity. Leveraging Twitter, this study explores social and psychological dynamics previously elusive to academic inquiry.

This investigation offers an effort to rigorously assess the relationship between individuals' Effective Network Size (ENS) on Twitter and their creativity. Our findings align with Burt's (2004) assertions, suggesting a positive correlation between ENS and creativity, challenging earlier conclusions by Zhou et al. (2009) and Perry-Smith (2006), who found no such link within non-digital contexts. This divergence highlights the distinctive nature of online versus offline network interactions.

By demonstrating a link between digital networking and creative activity, our research enriches the domain of online social network studies. Moreover, it advances the methodological landscape, employing direct data extraction from Twitter, thus avoiding the potential biases inherent in self-reported data (Parry et al., 2021).

Furthermore, the findings indicate that average distance (between the ego and its alters) moderates the correlation between ENS and creativity. When average distance was higher, ENS was more strongly correlated with creativity. Diverse social connections, as illuminated by sociologists like Burt (1992) and Granovetter (1977), offer individuals access to a broad spectrum of information and perspectives. Burt's theory of structural holes suggests that those bridging gaps between

different social groups act as brokers, combining disparate pieces of information in novel ways, thereby fostering creativity. Granovetter's work on the strength of weak ties posits that distant connections or acquaintances often provide more novel information than close ties, as the latter frequently share similar knowledge and perspectives. This exposure to varied ways of thinking, especially when interacting with people from different backgrounds, enhances cognitive diversity, challenging existing beliefs and stimulating innovative thought.

Furthermore, the geographical distribution of one's network (as evident by higher average distance) amplifies these benefits. Different regions come with their unique cultures, challenges, and ways of thinking. Engaging with geographically remote connections allows individuals to gain insights rooted in diverse local contexts, offering a richer array of ideas. This geographical diversity, combined with the cognitive diversity from varied social connections, reduces the risk of echo chambers and promotes the combination and recombination of ideas, which is often at the heart of innovation.

While no study is without limitations, several constraints within the study warrant recognition. Primarily, the research identified a correlational, rather than causative, link between ENS and creative output. Prospective investigations could rectify this by evaluating changes in creative levels pre- and post-modifications to users' Twitter networks. Additionally, by leveraging social media platforms' recommendation algorithms to introduce users to contacts outside their existing network, future research could explore the resultant variations in their creative capacities.

The second limitation of the study is that it examined Twitter only. Future studies should examine the findings on other online social networking sites and on different demographics. For instance, it would be interesting to examine the relationship between ENS and creativity on other age groups. One possibility could be children who use TikTok, a popular social media app for making and sharing short videos (Zhang et al., 2019). In addition, researchers could study the Chinese Twitter-like Weibo (Zhang and Pentina, 2012), and thereby explore any cultural gaps (Choi et al., 2011).

Thirdly, this study has primarily focused on analyzing creativity through the lens of utilizing new information in a meaningful way, before

this information becomes widely recognized or adopted by others. While this approach offers valuable insights (Runco, 2007), it limits the scope of our understanding of creativity. Creativity manifests in diverse forms and through various processes that are not solely reliant on the novelty of information. Future studies should aim to broaden the examining of relationship between ENS and creativity, by examining other dimensions of creativity. For instance, after assessing the ENS of individuals (through Twitter or other platforms), individuals can be asked to complete a survey which assess acceptable scales of creativity, such as the Torrance Tests of Creative Thinking (Torrance, 1966); or the Creative Achievement Questionnaire, developed by Carson et al. (2005); which has been employed in numerous studies to gauge creative success. These measures can provide a more holistic understanding of creativity, encompassing its multifaceted nature and its manifestation in different contexts and fields.

Lastly, the dynamic interplay between social media algorithms and the study's findings on Effective Network Size (ENS) and creativity, especially within Esports, underscores the algorithms' role in amplifying the visibility and engagement of creative content. Algorithms prioritize content based on user engagement and network connections, which could magnify the observed positive correlation between ENS and creativity by ensuring wider reach for individuals with larger, non-redundant networks. However, this relationship also highlights concerns about the generalizability of results across different platforms with distinct algorithms and over time, as algorithmic changes could alter the effectiveness of leveraging online networks for creativity. This evolving digital landscape suggests the need for ongoing research to understand how social media's algorithmic dynamics influence the creative potential of non-redundant social ties, offering insights for maximizing creativity in the face of changing online environments. Future studies could address this challenge through the study of creativity and ENS by unobtrusive methods; for example, using a Semantic Network Model to measure users' creativity on social networking sites (e.g., Yu et al., 2016).

## 6 Conclusion

The current study offers an initial insight into how the makeup of online social networks can influence the advantages that non-redundant social connections offer to creative endeavors. These findings not only underscore the importance of online social fabric in fostering innovation in fields like Esports, but also hint at the broader applicability of social networking sites as platforms for enhancing creativity. Furthermore, the implications of using online social networking sites extend beyond the realm of social capital; they also have a significant impact on creative output. Thus, this research illuminates a novel perspective on the advantages that may arise from engaging with social networking platforms. It invites a reevaluation of

these digital interactions, suggesting that they can serve as a catalyst for creativity, not just a means of communication or networking. This opens up new avenues for understanding how virtual connections fuel innovation and how strategic network expansion can foster creative development; hence offering valuable insights for leveraging online networks in cultivating creativity across various domains.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

The study was approved by the Institutional Review Board of Reichman University, Herzliya. Written informed consent from the patients/participants or patients/participants' legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

## Author contributions

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The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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