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Attachment and commitment of fans to their sports team: Modelling loyalty Behavior

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Abstract

This study aims to investigate the relationships between attachment, commitment, and loyalty among football fans, while also examining the moderating effect of interactivity in the commitment–loyalty link. The objective is to better understand how emotional connections and digital engagement influence long-term fan behavior. A conceptual model was developed based on an extensive literature review and a preliminary qualitative study. The proposed hypotheses were tested through a quantitative survey conducted with 428 football fans. Data were analyzed using the Partial Least Squares (PLS) method to evaluate the relationships between the variables. The results confirm that fan attachment significantly and positively influences commitment, which in turn fosters loyalty. Furthermore, the level of interactivity between fans and the sports team moderates the relationship between commitment and loyalty, reinforcing the strength of this connection. This research highlights the dual importance of emotional and interactive dimensions in cultivating fan loyalty. It emphasizes that fostering attachment and maintaining meaningful digital engagement are essential strategies for sports organizations aiming to build and sustain fan loyalty. Sports managers should prioritize the integration of social media and digital platforms into their communication strategies. Enhanced interactivity not only strengthens fan commitment but also plays a strategic role in loyalty development, offering a competitive advantage in the management of sports teams.

Keywords: Attachment, Commitment, Football fan, Interactivity, Loyalty, Sport marketing.

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Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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1. Introduction

Sport continues to play a significant sociocultural role worldwide, serving as a catalyst for development at the individual, societal, and economic levels. The growing intensity of sports participation stems from an increasingly diversified range of offerings tailored to meet the needs of both active participants and spectators. This commitment extends beyond educational and cultural dimensions to include, among others, commercial objectives. The growth and application of sports marketing illustrate this expansion of the sports domain. Governments, local authorities, associations, and businesses alike continue to provide services and activities under the "sport for all" ethos, aiming to spread the values of sports health, psychological well-being, entertainment, and socialization to a wider audience [1].

Unlike educational sports offerings, recreational sports offerings constitute a highly competitive domain, marked by intense rivalry among associative clubs. This competitive environment compels sports teams and clubs to adopt marketing strategies specifically tailored to this field. Sports marketing has thus emerged as an increasingly studied discipline in management schools and universities. It is a rapidly growing field of research with its own unique characteristics and nuances. Sports marketing can be defined as "a set of marketing strategies applied to the sports domain, aiming to develop sports organizations and clubs to make them more profitable" [2].

In academic research, numerous topics related to sponsorship, spectator behavior, media, sports ethics, and the role of CSR (corporate social responsibility) for football fans in observing their team, [3, 4] and the purchasing of sports goods have garnered considerable attention from scholars. Sports marketing, therefore, provides fertile ground for advancing and promoting sports in general, and football in particular. Indeed, the professionalization, commercialization, and mediatization of football have opened new opportunities for fan attachments, engagement, and identities [5].

This research focuses on three key concepts: attachment, commitment, and loyalty to a football team. Its objective is to explore the impact of attachment on commitment, as well as the influence of commitment on loyalty. Additionally, the moderating role of "interactivity" in the relationship between commitment and loyalty to a football team is examined.

These four concepts—attachment, commitment, loyalty, and interactivity—have been extensively studied in psychology, sociology, and marketing. However, their application in the sports domain remains underexplored. This research addresses this gap by positioning itself within the framework of sports marketing to study fan behavior toward their football team. More specifically, it investigates the influence of attachment and commitment on fan loyalty and examines the moderating role of interactivity in the commitment-loyalty relationship.

To address these questions, a study was conducted with a sample of football fans. A fan can be defined as "an enthusiastic devotee of a particular sports consumption object" (sport, team, player, coach, or any other strongly sports-related object) Guttman [6]. Hunt et al. [7] describe a fan as "a passionate follower of a specific sports consumption object."

In this research, the term "fans" is used because it conveys a deeper sense of passion, commitment, and emotion toward their team compared to the term "supporters."

In this perspective, our research question is formulated as follows:

To what extent do attachment and commitment contribute to the loyalty of fans toward their sports teams?

2. Literature Review

2.1. Attachment in Psychology and Marketing

The etymological definition of attachment encompasses several foundational concepts, such as devotion, loyalty, and adoration. This concept originates primarily from psychology, first appearing in the 1940s when English psychoanalyst [8] conducted studies on the attachment bond between mother and child. Freud argued that attachment is a primary human need, particularly in children, and is a sentiment unrelated to any other need [9]. Beyond psychology, attachment theory has been explored through various disciplines, including sociology and marketing. Kleine and Baker [10] delved deeper into the subject, suggesting that this type of sentiment extends beyond interpersonal relationships to include objects, places, brands, animals, and experiences.

The attachment reflects the persistence of emotional bonds and resistance to change. These bonds influence cognition and predict behavior [11]. Persistence refers to the degree to which an individual's attachment to an object remains unchanged over time, while resistance represents an individual's ability to reject a shift toward a competing brand [12].

2.2. Attachment to a Sports Team

Over the past twenty years, there has been a noticeable increase in research on the psychological attachment of sports spectators to components of sporting events, such as sports teams. Fans' attachment to a sports team is a behavior that increasingly attracts the attention of sports marketing specialists, as it drives sports fans to spend significant amounts on sports-related products and services.

This type of attachment is defined by Sutton et al. [13] as "the personal and emotional involvement of the consumer with a sports organization." Gladden and Funk [14] elaborate by explaining that a fan creates a mental web of "brand associations" that keeps them connected to the team. Other authors, such as Mahony et al. [15], refer to "team loyalty," a concept echoed by Wakefield and Sloan [16] in their studies on sports team loyalty, where they describe attachment to a sports team as a lasting allegiance.

The construction of an attachment bond with a sports team is a complex process that evolves over time [17]. This bond involves cognitive, social, economic, and technological variables. According to Funk and James [18], individuals progress through four stages to develop a high level of attachment: awareness, attraction, attachment, and allegiance. Each stage represents a state of psychological connection between the individual and the sports club. Bousquet [17] confirms this

progression by introducing a continuum of four stages, where an individual transitions from being a "non-fan" to an "enthusiast," then a "fan," and ultimately a "fanatic."

Sutton et al. [13] offer an explanatory model for understanding fan attachment to a sports team, incorporating factors such as the characteristics of the team, affiliation, and organizational attributes. They also consider the degree of attachment - weak, moderate, or strong - and the associated managerial benefits, such as reduced price sensitivity or diminished sensitivity to team performance. These factors contribute to the evolution of fan behavior, progressing from weak attachment to moderate attachment, and ultimately leading to a strong attachment to a sports team. According to this logic, Guo [19] used the psychological continuum model to measure the level of psychological involvement with the team in order to determine whether fans were casual, moderate, or loyal.

2.3. Fan Commitment with Their Sports Team

In marketing research, Anderson and Weitz [20], drawing on the work of Dwyer, et al. [21], defined commitment as "the willingness to make short-term sacrifices to maintain the relationship, akin to trust in the stability of the relationship." Moorman et al. [22] further characterized commitment as a "sustainable desire."

Yoshida, et al. [23] they were the first to introduce the term "fan commitment" in football spectator research, conceptualizing it as a non-transactional behavior. They defined fan commitment as "behaviors relating to both transactional and non-transactional exchanges in favor of one's preferred sports team."

In their study of fan attachment and commitment, Pimentel and Reynolds [24] conducted an exploratory qualitative study on football fans who are highly attached to their teams, aiming to develop a model explaining the various forms of commitment. They identified three forms of commitment: extrinsic commitment, involving spectators who plan ahead; normative commitment, reflecting spectators who feel obliged to engage; and affective commitment, where emotional significance plays a predominant role.

The authors also observed two types of fans. The first type consists of individuals who support their teams in exchange for something, often the team's success. Their attachment to the team remains stable and does not evolve over time. The second type consists of individuals who feel a fundamental sense of duty to support their teams. These fans are more likely to increase their identification with the team, making the team a form of self-expression. This is referred to as affective commitment, representing the behavioral extension of attachment and identification with the team.

2.4. Loyalty to the Sports Team

Loyalty is defined by Jacoby [25] as "a non-random behavioral response, expressed over time by a decision-making unit and directed toward one or more brands from a set of competing brands, based on a psychological decision-making or evaluation process." These authors attempted to define loyalty as consumer behavior that involves choosing among several alternatives at a given moment based on psychological processes.

Given the heterogeneity and abundance of research on loyalty, a synthesis is necessary to better understand the concept. Loyalty can be categorized into three main approaches: a behaviorist approach, focusing on the behavioral dimension of loyalty; a cognitive approach, addressing the intentional aspect of loyalty in response to the limitations of the behavioral approach; and a relational approach, considering loyalty as a dynamic relationship.

2.4.1. The Behaviorist Approach

The behaviorist perspective strongly influenced the conceptualization of consumer loyalty in the 1950s and 1960s. Tucker [26], drawing on the behaviorist school of thought, stated that the customer's behavior can serve as an explicit expression of their loyalty, making it unnecessary to be concerned with their thoughts in order to detect such an expression.

One of the most well-known behavioral measures is that of Brown, who categorized four types of behaviors based on purchase outcomes (using A, B, C, and D to represent identified brands): the non-loyalty pattern ABBACD, unstable loyalty AAABBB, shared loyalty ABABAB, and perfect loyalty AAAAAA.

2.4.2. The Cognitive Approach to Loyalty

Several authors have attempted to address the limitations of the behaviorist approach. Among these, Day [27], Jacoby [25] and Jacoby and Kyner [28] emphasized that brand loyalty cannot be reduced to its behavioral dimension or merely measured through repeated purchases. It is also necessary to ensure that, during repetitive purchases, the customer develops a favorable attitude toward the brand to distinguish loyalty from other forms of identical purchases. This attitudinal approach includes several axioms, such as: loyalty is not random, either biased or stochastic; loyalty is expressed over time; loyal customers have a preference for a brand within a competitive environment; and loyalty follows a cognitive process that ultimately results in a response.

2.4.3. The Relational Approach to Loyalty

A new perspective on loyalty has emerged, highlighting the importance of relational aspects in the customer-business relationship. In this relational perspective, loyalty is rooted in a logic of interdependence rather than dependence. The relationship between the customer and the brand is built on long-term sustainability. Loyalty is explained by commitment and trust. Brand loyalty, for instance, is the result of a commitment that reflects a long-term preference for the brand. Commitment is thus "a sustainable desire of the buyer to continue a relationship with a seller, supported by their willingness to make efforts to maintain it" [29].

In this logic, loyalty also results from a relational chain, which relies on all the variables related to the quality of the relationship between the customer and the brand. In the sports environment, the concept of loyalty increasingly attracts the attention of academics and practitioners in sports marketing. Wakefield and Sloan [16] define loyalty to a sports team as "an allegiance to the team, centered on the spectator's interest in the team, and developed over time."

The primary objective of today's sports team marketing managers is to strengthen and, above all, maintain fans' relationships with their team, regardless of the team's performance. Thus, loyalty constitutes the foundation of any long-term relationship and must be considered in the management of contemporary sports teams [30].

2.5. Relationship Between Attachment and Commitment with a Sports Team

The link between attachment and commitment has been addressed by several authors, ultimately leading to a consensus. These two concepts have often been confused. An individual attached to a brand demonstrates a certain degree of stable preference over time [31]. Many authors have studied and demonstrated the causal relationship between these two concepts.

Several researchers Thomson et al. [32] and Grisaffe and Nguyen [33] concluded that emotional attachment has a strong and positive effect on consumer commitment. Other authors [34-36] support the hypothesis that sports team fans are more likely to develop a strong emotional bond with their team (emotional attachment). Individuals who are strongly attached to their teams tend to engage more, devoting more time and money [34]. Authors typically classify fan commitment to their teams into two types: transactional (money spent, donations, subscriptions, etc.) and non-transactional (following the team, supporting it, communicating about the team on social media, etc.).

Thomson, et al. [32] explored the concept of attachment through the literature in social psychology and demonstrated that an individual's attachment to a brand predicts their commitment. They confirmed the causal link between the two concepts through an empirical study involving 179 respondents.

Following the same logic of a causal link between attachment and commitment, Lacoëuilhe [37] conducted a study on 311 individuals across three product categories (tights, women's deodorants, and detergents), verifying that attachment predicts commitment. Lacoëuilhe [38] and Lacoëuilhe [37] clarified that theoretical findings often converge toward a logic of influence, flowing from attachment to loyalty through commitment.

In other works, including those by Pimentel and Reynolds [24] and Mercier and Roux [39], the affective feeling (investment) was considered a dimension of attachment. These studies used the term "dividend" to describe the "cognitive connection," regarded as a second dimension of attachment.

In marketing research, it has been demonstrated that emotional attachment to a brand is closely linked to proximity maintenance (the commitment to preserving a relationship with a brand), as well as to separation anxiety (the perception that the brand is irreplaceable). Consequently, this leads to loyal behavior toward the brand. Loyalty is also a result of commitment, which has consistently been regarded by marketing researchers as an antecedent variable to brand loyalty.

This literature review on the relationship between attachment and affective commitment allows us to formulate our first hypothesis.

H₁: Attachment influences fan commitment to their sports team.

H_{1.1}: The cognitive connection of attachment positively influences fan commitment to their sports team.

H_{1.2}: Affective feelings positively influence fan commitment to their sports team.

2.6. Relationship Between Commitment and Fans' Attitudinal and Behavioral Loyalty

Nearly all research on attachment, commitment, and loyalty to sports teams confirms that emotional attachment to a sports team is closely linked to proximity maintenance, reflecting the commitment to preserving the relationship with the team.

In an empirical study, Harris and Ogbonna [40] demonstrated that commitment represents both behavior and a long-term orientation for many sports teams, which heavily rely on this commitment and work to strengthen it in order to maintain and retain fans. The notion of fan commitment is purely psychological and mediates or guides a fan's behavior toward their team. The degree of fan commitment can vary among individuals, often referred to as the strength of commitment, which is measured through the fan's favorable attitude.

Some authors classify commitment and fan involvement as two dimensions of loyalty but emphasize the need for these dimensions to coexist simultaneously. Separating commitment and loyalty is therefore a reasonable approach to understanding the relationship between these two concepts. The commitment process, as described by Day [27] and Jacoby and Kyner [28], clearly shows that commitment leads to loyalty and, consequently, should not be conflated.

Several authors, such as Day [27], Jacoby and Kyner [28] and Bee and Havitz [41], have emphasized the clear distinction between commitment and loyalty, demonstrating that commitment precedes loyalty and contributes to its maintenance and reinforcement. Pritchard et al. [42] even described loyalty as a "blend" of attitude and behavior, excluding commitment from this blend. Initially, these findings applied to brand commitment and loyalty but were later extended to the sports domain.

Bee and Havitz [41] used psychological commitment and resistance to change to explain the understanding of the attitudinal and behavioral dimensions of loyalty in sports. In sports, the bidimensional approach to loyalty is the most commonly used in research, comprising both attitudinal and behavioral elements [43].

Indeed, loyalty in sports is discussed only when positive attitudes and favorable behaviors coexist. Behavioral loyalty is frequently measured by the frequency of stadium visits [44].

Similarly, Funk and James [18] used resistance to change (equated with commitment by most researchers) to conceptualize the attitudinal dimension of loyalty, noting that commitment—and/or resistance to change—can be considered

an antecedent variable of the attitudinal dimension of loyalty to a sports team. While Iwasaki and Havitz [44] consider commitment as part of the attitudinal dimension in their attempts to conceptualize loyalty and commitment, Pritchard et al. [42] took a contrary position, treating commitment as a concept distinct from loyalty. They conceptualized commitment and resistance to change as antecedents of loyalty.

Thus, our second research hypothesis is formulated as follows.

H₂: Commitment influences fan loyalty to their sports team.

H_{2.1}: Commitment positively influences fans' behavioral loyalty to their sports team.

H_{2.2}: Commitment positively influences fans' attitudinal loyalty to their sports team.

2.7. Moderating Role of Interactivity in the Commitment-Loyalty Relationship

Interactivity is defined as "the extent to which users can participate in modifying the form and content of a mediated environment in real time" [45]. Interactivity results from the properties of a technology [45, 46] and/or the technology's ability to enable users to interact more easily with content and become more involved in it [47].

In sports marketing, the propensity for interactivity is defined as "the openness and willingness of the sports team to create and value two-way communication with individuals outside the organization" [48].

The results of several studies conducted in a sports context indicate that, for certain fans, reciprocal communication with team members—players, coaches, managers, etc.—is essential for feeling close to their team and directly connected to all stakeholders. This could even contribute to protecting the reputation of the sports organization, as managers would, using all means of communication, direct fans towards behaviors that would reinforce the image of their teams [49].

In the world of professional football, supporters or fans represent the primary customers of football clubs. To strengthen relationships with these fans, it is essential for these organizations to satisfy and listen to them. Thanks to technological innovations and the digitalization of professional football clubs, it is now possible to build databases to better understand the various categories of supporters.

Interactivity can create additional value in the relationship between fans and their team and contributes to reinforcing positive behaviors among supporters [48]. Sports organizations should therefore facilitate online interactivity for fans. Sports teams and governing bodies now recognize the need for interactivity and understand that it could lead to higher levels of commitment among supporters.

All major teams today have made efforts to develop better relationships with their fans. These teams have particularly invested in social media, allowing fans to interact with their teams continuously, 24 hours a day, 7 days a week. Teams aim not only to provide better services to their fans but also to ensure that fans can interact with the team whenever they wish. This communication evolution seeks to achieve sustained commitment through exchanges, thereby strengthening fan loyalty to their teams.

Sports organizations continue to invest in digital tools to establish more direct connections with their fans, enabling them to experience new, innovative "fan experiences." They have understood that the fan must be at the center of their communication strategies—what is known as "customer-centric." These strategies strengthen fan commitment and, most importantly, ensure their loyalty to the team.

In his research on interactivity in sports, Bodet [43] concludes that "the majority of supporters consistently express their need for contact and interaction with their team." He adds that "any interaction can influence psychological commitment to the team." Several authors, such as Bauer, et al. [50], Theodorakis et al. [51] and Yoshida et al. [23] in their work on the conceptualization of the behavioral dimension of loyalty in the "football industries"—particularly regarding spectator behavior—consider that interactivity, through "social media," forms part of the non-transactional dimensionality of loyalty.

These theoretical findings on the importance of interactivity as a highly determinant variable in the relationship between commitment and loyalty allow us to propose the following hypothesis.

H₃: Digital interactivity strengthens the relationship between fan commitment and loyalty to their sports teams.

H_{3.1}: Digital interactivity strengthens the relationship between fan commitment and attitudinal loyalty to their sports team.

H_{3.2}: Digital interactivity strengthens the relationship between fan commitment and behavioral loyalty to their sports team.

The literature review and formulation of research hypotheses enable us to develop the following conceptual model (see Figure 1).

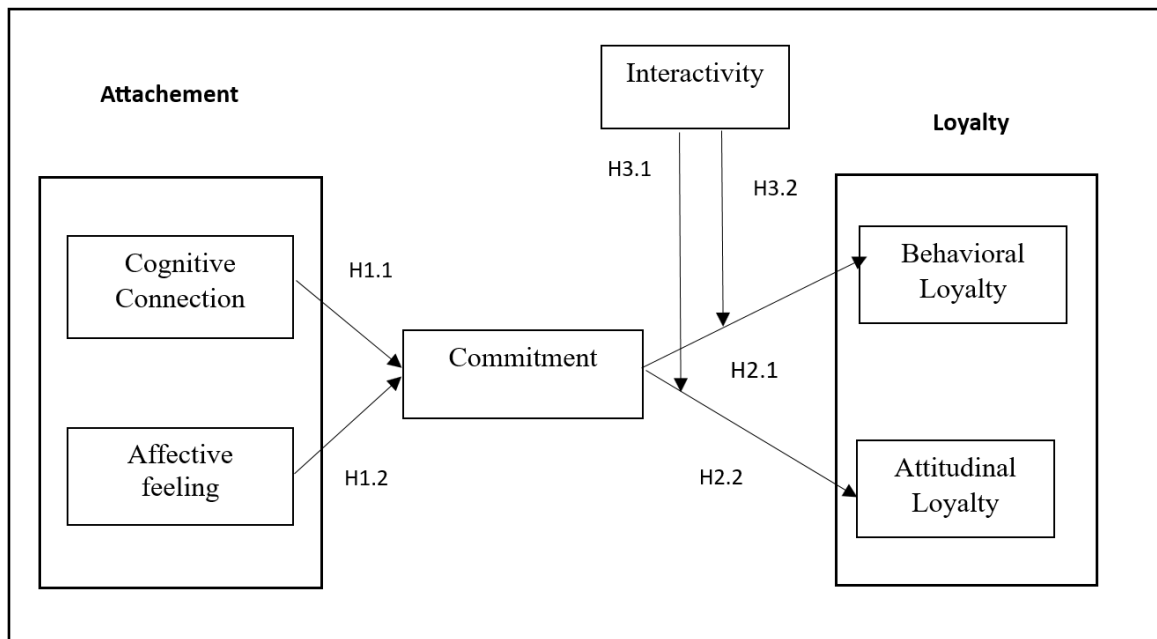


Figure 1.
Conceptual model.

3. Research Methodology

3.1. Target Population and Sampling Method

The target population for this study consists of all fans of EST (Étoile Sportive du Sahel). Supporters who frequently participate in the team's events, maintain regular contact with other fans and the team on social media, and actively share content on the EST platform are considered fans of the team.

Distributing the questionnaire online made data collection more manageable. We launched the questionnaire to all group members and received 428 correctly completed and valid responses for analysis.

In this research, survey-based data collection was adopted. A questionnaire was distributed via Google Forms through the Facebook page of EST supporters, specifically the "EST" group, which included 44,400 members and was created on 7 July 2011. This group served as the base for potential respondents. This method provided reassurance regarding the digital interactivity of respondents, as the hypothesis of the moderating variable (interactivity) presupposes the existence of a connection between fans and between fans and the team, as well as other stakeholders.

Pre-Test of the Questionnaire: Once the questionnaire was developed, it was tested on 60 EST fans. This pre-test was conducted during a match between EST and CA at the stadium entrance. Any unclear questions were reformulated to ensure that all categories of respondents could understand them without difficulty. The final sample size consists of 428 fans. The composition of this sample is as follows Table 1 and Table 2.

Table 1.
Distribution by Gender.

Gender	Frequency	Percentage
Male	301	70.4
Female	127	29.6
Total	428	100

Table 2.
Distribution by Age.

	Frequency	Valid Percentage
(15- 20 years old)	156	36.4
(21-30 years old)	118	27.6
(31-40years old)	77	18.0
(41-50years old)	39	9.1
51 years old and +	38	8.9
Total	428	100.0

3.2. Operationalization of Variables

The variable *Attachment* comprises two dimensions, which in turn consist of three and four items, respectively.

The variable *Commitment* is unidimensional, with a single factorial axis accounting for 62% of the explained information. It consists of five items.

For *Loyalty*, two factorial axes are retained. The first represents 51.86% of the information, and the second accounts for 30.31%. The cumulative variance thus explains 82.17% of the information. This variable consists of six items.

Interactivity, composed of six items, is also a unidimensional variable, with a single axis representing the concept and explaining 79.0% of the information.

The results of the exploratory analysis, providing the values for key tests and parameters (Cronbach's alpha, KMO, and Sig), are summarized in Table 3:

Table 3.
Explanatory Factor Analysis.

Variables	Variance explained	Cronbach's alpha	KMO	Sig
Attachement	82.367	0.752	0.792	0.000
Commitment	66.250	0.822	0.797	0.000
Loyalty	82.178	0.795	0.693	0.000
Interactivity	0.790	0.890	0.823	0.000

The exploratory factor analysis of the different measurement scales reveals KMO values above 0.5, with $p = 0.000$. A total explained variance exceeding 50% for the different measurement scales indicates that the factorization of the data is acceptable.

The Cronbach's alpha coefficients range between 0.752 and 0.890, indicating good internal reliability of the measurement scales used in this study.

3.3. Confirmatory Analysis

To estimate the conceptual model and test the research hypotheses of this study, we used the structural equation modeling (SEM) method. The modeling approach adopted is the Partial Least Squares (PLS) method.

This method was chosen primarily to verify the relationships between the latent variables in the model, including the moderating variable.

According to Hair et al. [52] this method allows for the simultaneous testing of two models: a structural (internal) model that encompasses latent variables and a measurement (external) model that includes latent variables and their relationships with the indicators or items linking them..

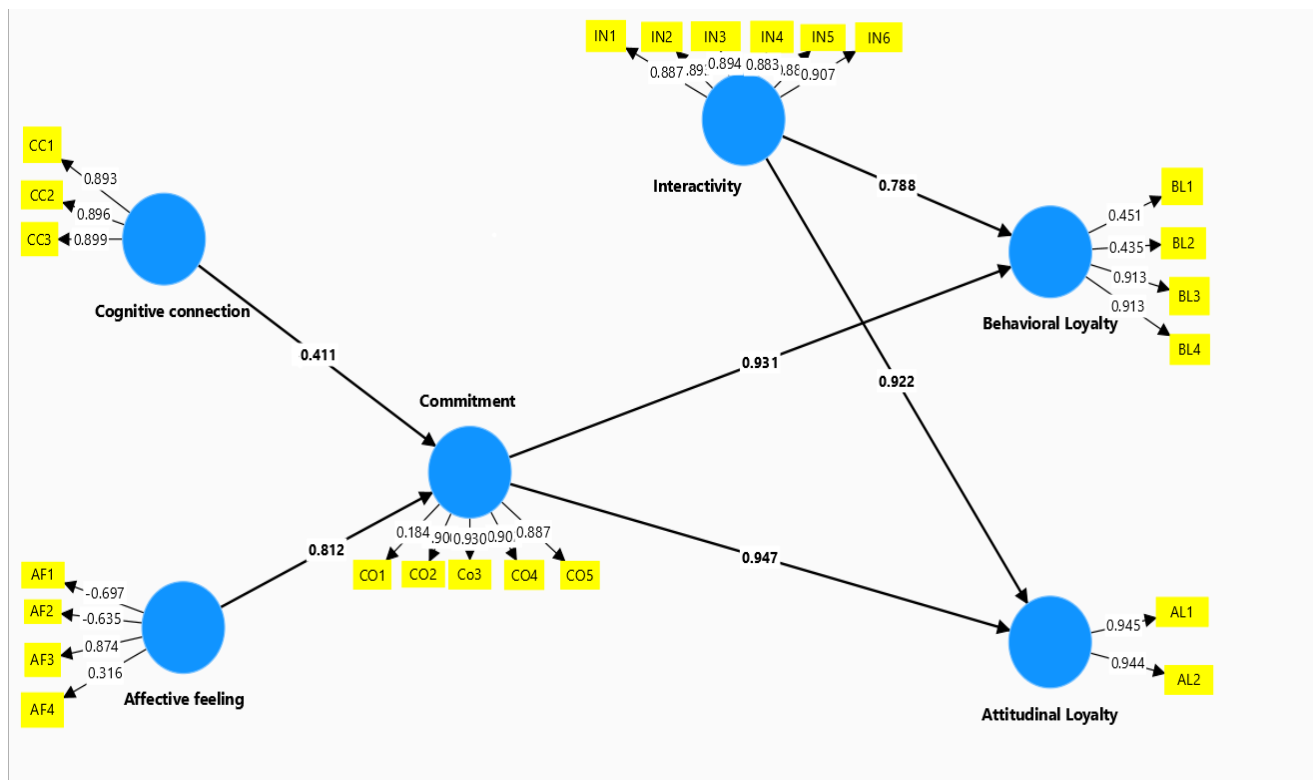


Figure 2.
Representation of the Conceptual Model Using PLS.

Table 4.

Validity and Reability.

Variables and dimensions		Cronbach's alpha	<i>Rho_A</i>	CR	AVE
Attachement	Cognitive Connection	0.878	0.887	0.924	0.904
	Affective Feeling	0.799	0.890	0.923	0.803
Commitment (one-dimensional)		0.831	0.928	0.894	0.663
Loyalty	Attitudinal Loyalty	0.880	0.780	0.943	0.893
	Behavioral Loyalty	0.728	0.911	0.749	0.772
Interactivity (one-dimensional)		0.948	0.902	0.958	0.793

3.4. Validation of the Measurement Model

3.4.1. Convergent Validity of Constructs

The PLS factorial algorithm applied to the dataset from our study provides the necessary results to verify the validity and reliability of the measurement scales for each variable. These results include internal consistency reliability (Cronbach's alpha), composite reliability (CR), convergent validity (AVE), and discriminant validity. The results are summarized in Table 4.

All values are acceptable and fall within the suggested standards, thus the measurement model is deemed to have satisfactory validity.

3.4.2. Discriminant Validity of Constructs

Discriminant validity is "the extent to which a construct is truly distinct from other constructs, in terms of its correlation with other constructs, as well as the extent to which indicators represent only one construct" [53]. The "Fornell-Larcker" criterion provides insight into the correlation of constructs and their differences from each other. The value of a variable with itself must be higher than its value with other constructs. The results obtained, summarized in Table 5, show that for each variable, the external loadings of an indicator on a construct are higher than all its cross-loadings with other constructs. These results allow us to conclude that the discriminant validity of the measurement models is well justified.

Table 5.

Results of Discriminant Validity for All Constructs of the Measurement Model ("Fornell-Larcker").

	Cognitive connection	Affective feeling	Moderating effect 1	Moderating effect 2	Commitment	Behavioral loyalty	Attitudinal loyalty	Interactivity
Cognitive connection	0.662							
Affective feeling	0.725	0.896						
Moderating effect 1	0.501	0.266	0.634					
Moderating effect 2	0.501	0.266	0.431	0.531				
Commitment	0.807	0.410	0.673	0.673	0.814			
Behavioral loyalty	0.708	0.374	0.671	0.671	0.955	0.985		
Attitudinal loyalty	0.834	0.409	0.615	0.615	0.956	0.827	0.998	
Interactivity	0.734	0.415	0.656	0.656	0.825	0.722	0.844	0.891

3.4.3. Quality of Fit of the Structural Model

To test and ensure the structural validity of the conceptual model, we can use the coefficient of determination (R^2) and the Stone-Geisser Q^2 fit index.

According to Hair, et al. [54] "the coefficient of determination (R^2) is a measure of the predictive accuracy of the model."

The Stone-Geisser Q^2 index allows for the evaluation of the predictive relevance of our model. Its purpose is to measure the quality of each structural equation. It is calculated using the blindfolding procedure. If the Q^2 value is positive, the model demonstrates predictive validity; if it approaches 1, the model exhibits perfect predictive validity.

Table 6.
 R^2 and Q^2 Values.

Variables and Dimensions	R^2	Adjusted R^2	Q^2	
			Similarity	Redundancy
Cognitive Connection	0.441	0.440	0.798	0.140
Affective Feeling	0.669	0.665	0.832	0.250
Commitment	0.408	0.406	0.922	0.609
Behavioral Loyalty	0.527	0.523	0.784	0.326
Attitudinal Loyalty	0.523	0.520	0.799	0.422
Interactivity	0.759	0.754	0.889	0.358

We observe that the values of the different R^2 coefficients in our study are all greater than 0.1, ranging from 0.440 (for cognitive connection) to 0.754 (for interactivity). This confirms the robustness of our model, in line with the recommendations of Croutsche [55].

All Q^2 values are greater than 0 (concerning similarity) and are close to 1 (0.798, 0.832, 0.922, 0.784, 0.799, and 0.889). This indicates that the predictive validity of our model is considered perfect [56].

3.5. Testing the Research Hypotheses

3.5.1. Relationship: Attachment, Commitment, and Loyalty

The analysis of the direct effects of the structural model provides insights into the correlation between constructs by estimating the T-value (standard deviation), which must be greater than 2, and the significance of the correlation links (P-value), which must be below the risk threshold of 5% (< 0.05). Table 7 illustrates the direct effects of the different relationships (associations) between the variables and their respective dimensions.

Table 7.
Path Analysis.

Association	β	Standard Deviation (STDEV)	T-Value (O/STDEV)	P-Value (Sig)
AffectiveFeeling -> Commitment	0.812	1.074	22.969	0.000
CognitiveConnection -> Commitment	0.411	0.366	8.118	0.000
Commitment -> AttitudinalLoyalty	0.947	0.675	10.654	0.000
Commitment -> BehavioralLoyalty	0.931	1.219	21.296	0.000

Table 7 shows that all direct effects have a T-value greater than the threshold of 2 and are statistically significant at a P-value $< 5\%$, with all P-values equal to 0.000.

Thus, the results confirm our hypotheses: H1 (H1.1, H1.2) and H2 (H2.1, H2.2).

3.5.2. Moderating Role of Interactivity

Interactivity moderates the relationship between commitment and loyalty in our model.

To verify this causal relationship (moderation), we began with a dynamic cluster analysis, followed by testing the moderation effect using PLS. Dynamic cluster analysis is a descriptive multivariate method that allows us to compare the degrees of interactivity between two groups: one with high interactivity and the other with low interactivity. In this study, the technique identified a low-interactivity group consisting of 119 individuals (28%) and a high-interactivity group consisting of 309 individuals (72%).

Table 8.
ANOVA Results.

Items	Group 1: High Involvement	Group 2: Low Involvement	F: ANOVA	P
Interactivity 1	1.201	0.877	121.181	0.000
Interactivity 2	1.214	0.819	34.635	0.000
Interactivity 3	0.903	0.721	35.213	0.000
Interactivity 4	0.802	0.532	25.202	0.000
Interactivity 5	1.298	0.710	14.298	0.000
Interactivity 7	0.797	0.648	30.727	0.000
Number of Observations	308	119		
Percentage	72 %	28 %		
Convergence achieved After 5 Iterations				

The results summarized in Table 8 show that the ANOVA tests are significant ($P = 0.000$). Fisher's F statistic indicates the relevance of interactivity items in generating the groups.

We examined the moderating effect of interactivity using the PLS approach by performing bootstrapping, which determines the structural coefficients and their significance.

The moderating effect of interactivity is confirmed, as the P-values for the two relationships (interactivity–behavioral loyalty and commitment–attitudinal loyalty) are 0.000 and 0.002, respectively, both of which are less than 0.05, with a confidence interval of 5% (Table 9). These results confirm hypothesis H3.

Table 9.
Moderating Effect of Interactivity Demonstrated by PLS.

	Initial Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Value (O/STDEV)	p -Values
Interactivity -> AttitudinalLoyalty	0.299	0.299	0.063	4.753	0.000
Interactivity -> BehavioralLoyalty	-0.282	-0.279	0.069	4.114	0.000
Mod_Int_Eng_FidC -> BehavioralLoyalty	0.604	1.004	0.005	2.776	0.000
mod_Int_eng_fidAt -> AttitudinalLoyalty	0.400	0.920	0.004	4.392	0.002

4. Discussion of Results

4.1. Fan Attachment and Commitment

Fan attachment to their team reflects a form of psychological connection that enables fans to remain closely linked to their team. This connection is illustrated by the "cognitive connection" dimension of the attachment concept. According to Gladden and Funk [14], a fan creates a mental "brand association" web that keeps them connected to their team. In Hypothesis 1, this connection is represented by the "cognitive connection" dimension, measured through items such as "attached," "connected," and "passionate."

Wakefield and Sloan [16] describe this connection as a lasting allegiance or a sense of obligation, which manifests as commitment to the team. Fans of EST demonstrated this relational logic between attachment and commitment.

Hypothesis H1 is therefore fully consistent with theoretical approaches that emphasize the influence of attachment on sports commitment.

Building an attachment bond with a sports team is a process involving cognitive variables [17]. The direct influence of the two dimensions, "affective attachment" and "cognitive connection," on fan commitment, as demonstrated by Hypothesis H1, attests to this process. Commitment to the team, according to surveyed fans, reflects the presence of an emotional bond and positive thoughts toward the team.

"Attachment without commitment and commitment without attachment" were phrases cited by respondents during interviews, indicating that commitment is also reflected in how fans are involved in the daily life of EST. Attachment drives this willingness to be with, within, and behind the team.

4.2. Fan Commitment and Loyalty

The hypothesis regarding the relationship between commitment and loyalty demonstrates that fans are not engaged intermittently; rather, they strengthen their loyalty through this commitment.

Loyalty is indeed linked to commitment, as fans report making both material and emotional sacrifices to support their team. This finding aligns with theories of transactional and non-transactional commitment, primarily developed by Funk and James [18] in the sports domain.

The impact of commitment on the two dimensions of loyalty is consistent with findings on loyalty in the sports context. This result aligns with Bodet [43]'s research on sports tourism, which reached similar conclusions.

Theories of commitment and loyalty in sports emphasize the strong similarity between these two concepts. Transactional and non-transactional behaviors are frequently associated with both loyalty and commitment in the literature [18, 57].

Our research results did not allow for a clear separation between these concepts, as fans often referred to loyalty when discussing commitment. However, the questionnaire was designed to differentiate the two concepts and measure the

relationship between them. Commitment, as an antecedent variable to loyalty, was clearly demonstrated, with its positive influence being statistically validated.

4.3. The Effect of Interactivity on Commitment and Loyalty

Interactivity enables fans to follow their team via social media, interact with other friends online, and navigate the team's website.

For many fans, social media provides a platform to explore EST's websites. Fans view commitment as a form of ritual support for the team and as a behavior rooted in attachment to their team. When asked what drives their interactivity with the team and other fans, respondents cited following sports events, assisting the team, participating in discussion forums, and similar activities.

Social media also allows fans to experience events live, ensuring they have a voice and a say in matters. Respondents believe that EST should leverage more technology to stay connected and offer improved experiences. Hybrid events, virtual stands, virtual tours, and live discussions—both among fans and between EST and its fans—help maintain relationships between all stakeholders and further enhance fan loyalty.

Zagnoli and Radicchi [58] describe a system of relationships where fans influence the internal dynamics of social networks that have developed over the past decade. They studied the role of social interactions in individual sports experiences and found that attending an online sports event fulfills fans' need for sociability.

Several respondents expressed feelings of sociability generated through interactivity, which, according to them, reflects their commitment and loyalty to EST.

Insights gathered during interviews highlight the role of sociability among fans and its impact on enhancing fan loyalty.

The results of our study complement existing literature, showing that interactivity effectively connects fans, mobilizing their resources, energy, and commitment around the team's interests. This proves to be a highly effective means of strengthening fan commitment and loyalty.

5. Conclusion

The objective of this research was to advance the understanding of sports fans' behavior in general and football team supporters in particular. The study aimed to determine how attachment to a sports team leads, through engagement, to loyalty toward that team. Additionally, it sought to highlight the importance of the interactivity variable in its moderating role within the causal link between engagement and loyalty.

A conceptual model was developed and empirically tested in this research. The uniqueness of this model lies in its integration of the variables attachment, engagement, loyalty, and interactivity, following a linear logic that reflects the explanatory role of each variable (antecedent, mediating, moderating, and dependent). To the best of our knowledge, this is the first study to present such a precise and conceptual representation of fan behavior concerning a football team. In this research, the combination of attachment and engagement and their role in fostering loyalty constitutes a highly interesting scientific contribution.

Interactivity (or the propensity for interactivity, as defined by some authors such as Ratten et al. [59] and Grönroos [48]) was demonstrated to be a moderating variable, strengthening the relationship between engagement and loyalty. This finding aligns with previous studies by Ratten et al. [59] and Bodet [43] who theoretically justified the significant and positive effect of interactivity on engagement, particularly in the context of reciprocal communication in settings similar to ours.

The results of this research indicate that when self-connections to the sports team (connection, proximity) are present and attachment is strong, the fan feels more engaged with their team (both cognitively and affectively) as well as with other fans (social engagement).

5.1. Theoretical and Methodological Contributions

The theoretical and methodological contributions of this thesis can be structured around two main axes: a deeper understanding of concepts related to sports marketing—particularly the analysis of spectator (fan) behavior towards a sports team—and the modeling of attachment, engagement, and loyalty to a sports team.

The level of attachment and engagement among fans, as well as the complexity of their behaviors, has not been extensively studied in the field of sports. These two concepts have been widely examined in brand loyalty contexts, but few studies have explored their significance in relation to sports teams, particularly football teams.

Moreover, the social behavior of fans in online environments has proven to be a crucial aspect of this study. It has been observed that engagement with a sports team can also manifest through social media interactions. The introduction of the interactivity variable in our research has allowed us to uncover and, more importantly, justify this finding.

5.2. Managerial Recommendations

The high level of engagement that many spectators develop toward their national team should be accompanied by additional efforts from team managers to facilitate the purchase of sports-related products. In the literature, consumer behaviors are often categorized into transactional and non-transactional behaviors. Transactional behavior involves purchases, expenses, and consumption, while non-transactional behavior refers to intangible support for the team, such as attendance at matches and positive word-of-mouth. Both forms of behavior need to be stimulated by marketing managers, as they are essential for the team's long-term sustainability.

Among spectators, aside from dedicated fans, our study identified a category of individuals known as *Flâneurs*, a term originally described by Giulianotti [60] to refer to postmodern spectators who collect experiences with little or no lasting

emotional investment. *Flâneurs* exhibit minimal engagement—they watch three to four major matches per year, mainly high-profile events, seeking to be part of the social group, stay informed, and continuously prove their affiliation with the team, particularly through social media messages and comments.

In this context, the role of managers is to foster the development of connections with the team. This means creating favorable conditions that encourage a strong identification between fans, *Flâneurs*, and the team. Achieving this requires direct interaction between the team and its environment, particularly through the development of digital interactivity.

This behavior aligns, to some extent, with the event-followers typology developed by Bouzdine-Chameeva et al. [61]. Consequently, team managers must actively maintain and strengthen social media engagement with these *Flâneurs*, encouraging them to support the team in a more consistent and long-term manner. This can be achieved through regular awareness and engagement initiatives designed to convert *Flâneurs* into more loyal supporters.

5.3. Research Limitations

Online data collection through forums, social media, and other digital platforms offers numerous advantages; however, this method presents two main limitations. First, only individuals with access to a computer, smartphone, or tablet and an internet connection can participate in the survey. Given that football is the most popular sport worldwide and spans all social classes, this creates a significant bias. A large proportion of lower-income individuals may not own digital devices or struggle to afford internet access, preventing them from participating in the study.

The second limitation is that the study did not explore the antecedents of fan engagement. For instance, Yoshida et al. [23] conceptualized club identification as a precursor to engagement. This aspect was not addressed in our research, as our focus was not on fan identification per se. However, the phenomenon of *BIRGing*¹ (Basking in Reflected Glory) may underlie several components of fan engagement, as suggested by theories on fan resources.

Additional factors could also be examined, such as low levels of *CORFing*² (Cutting Off Reflected Failure). This behavior is particularly sensitive, as it weakens the attachment to the team during challenging times. Both *BIRGing* and *CORFing* are widely observed in collective sports, especially football. Team managers are well aware of this dynamic and recognize that in cases of *CORFing*, a team may face significant risks. The temporary withdrawal of fans can place the team in a precarious situation, particularly from a financial standpoint.

5.4. Future Research Directions

Incorporating the governing body of a sport into a research model could provide deeper insights into the development of fan loyalty toward a sports team. This approach could be expanded further by involving all relevant stakeholders in the model, including team managers, regional authorities, financial backers, sponsors, and media representatives. Such an expansion would introduce a novel perspective in sports marketing research.

Indeed, the absence of prior studies incorporating a sports governing body in the spectator-team relationship suggests a promising research avenue.

Given the findings of this study regarding attachment and even a form of emotional connection or "love" developed toward football teams, it appears crucial to investigate issues related to the growth of the sports merchandise market associated with football teams. Future research could explore areas such as the personalization of sports products, the promotion of teams through tailored marketing strategies, and the organization of annual football trade fairs bringing together all teams. Such events could help mitigate hostility between rival teams. Additionally, opening dedicated merchandise stores in stadiums to sell team-branded products could be an effective strategy. These avenues represent promising research directions that could further develop this topic.

References

- [1] A. A. Adeoya, A. O. Adeleye, and S. Egawa, *Psychological factors as predictor of sport participation among Japanese and foreign students in Sendai, Japan* (Sport Psychology in Sports, Exercise and Physical Activity). IntechOpen. <https://doi.org/10.5772/intechopen.99244>, 2021.
- [2] D. Vaillau, *What sports equipment for tomorrow?* Persée: INSEP Notebook, 2010.
- [3] S. S. Boroujerdi, H. Mansouri, S. H. Hassan, and Z. Nadri, "The Influence of Team Social Responsibility in the attitudinal loyalty of football fans: The mediating role of team identity and team trust," *Asian Journal of Sport History & Culture*, vol. 2, no. 3, pp. 350-371, 2023. <https://doi.org/10.1080/27690148.2023.2270541>
- [4] L. E. Robinson, N. Colabianchi, R. E. Hasson, K. Heinze, D. Kinnett-Hopkins, and N. Shin, "Harnessing the power of sport and physical activity for social change: An interdisciplinary approach to address health equity," *Kinesiology Review*, vol. 14, no. 1, pp. 23-29, 2024.
- [5] R. Allison and S. Pope, "Becoming fans: Socialization and motivations of fans of the England and US women's national football teams," *Sociology of Sport Journal*, vol. 39, no. 3, pp. 287-297, 2021. <https://doi.org/10.1123/ssj.2021-0036>
- [6] A. Guttman, *Sports spectators*. New York: Columbia University Press, 1986.
- [7] K. A. Hunt, T. Bristol, and R. E. Bashaw, "A conceptual approach to classifying sports fans," *Journal of Services Marketing*, vol. 13, no. 6, pp. 439-452, 1999.

¹ *BIRGing* (Basking in Reflected Glory) is a concept of personal identity that refers to "basking in reflected glory." It suggests that individuals enhance their self-esteem and perceived self-worth by identifying with the success of a group or individual. This concept is commonly used in relation to sports team fans. When a team achieves success, it is perceived positively, and the associations with its supporters are also favorable. Fans tend to associate themselves with and identify more strongly with the team's performance, proudly showcasing their connection to the team.

² *CORFing* (Cutting Off Reflected Failure) occurs when a team is unsuccessful, leading to negative associations between the supporters and the team. As a result, fans tend to distance themselves from the team as long as it continues to underperform. Following a team's defeat, supporters are less likely to wear its colors, attend events, or show their support, especially in away games. This dissociation serves as a psychological mechanism for fans to avoid sharing in the team's failure.

- [8] J. Bowlby, *Attachment and loss: Volume I. Attachment*. London: Hogarth Press, 1969.
- [9] G. Susan, M. Roy, and K. J., *Attachement theory: Social, developmental and clinical perspectives*. UK: Routledge, 2000.
- [10] S. S. Kleine and S. M. Baker, "An integrative review of material possession attachment," *Academy of Marketing Science Review*, vol. 1, no. 1, pp. 1-39, 2004.
- [11] J. A. Krosnick and R. E. Petty, *Attitude strength: Antecedents and consequences*. Mahwah: Lawrence Erlbaum, 1995.
- [12] R. E. Petty and J. T. Cacioppo, "The elaboration likelihood model of persuasion," *Advances in Experimental Social Psychology*, vol. 19, pp. 123–205, 1986.
- [13] W. A. Sutton, M. A. McDonald, G. R. Milne, and J. Cimperman, "Creating and fostering fan identification in professional sports," *Sport Marketing Quarterly*, vol. 6, no. 1, pp. 15-22, 1997.
- [14] J. M. Gladden and D. C. Funk, "Developing an understanding of brand associations in team sport: Empirical evidence from consumers of professional sport," *Journal of Sport Management*, vol. 16, no. 1, pp. 54-81, 2002. <https://doi.org/10.1123/jsm.16.1.54>
- [15] D. F. Mahony, R. Madrigal, and D. Howard, "Using the psychological commitment to team (PCT) scale to segment sport consumers based on loyalty," *Sport Marketing Quarterly*, vol. 9, no. 1, pp. 15–25, 2000.
- [16] K. L. Wakefield and H. J. Sloan, "The effects of team loyalty and selected stadium factors on spectator attendance," *Journal of Sport Management*, vol. 9, no. 2, pp. 153-172, 1995. <https://doi.org/10.1123/jsm.9.2.153>
- [17] J. Bousquet, "Exploratory study of the process of defanaticization in the fan/sports team relationship," Doctoral Dissertation, University of Quebec in Montreal, 2010.
- [18] D. C. Funk and J. D. James, "Consumer loyalty: The meaning of attachment in the development of sport team allegiance," *Journal of Sport Management*, vol. 20, no. 2, pp. 189-217, 2006. <https://doi.org/10.1123/jsm.20.2.189>
- [19] S. Guo, "Sport fan motivation: A comparison of local, nonlocal, and distant National Basketball Association fans in the United States and China," *International Journal of Sport Communication*, vol. 16, no. 1, pp. 43-52, 2022. <https://doi.org/10.1123/ijsc.2022-0125>
- [20] E. Anderson and B. Weitz, "The use of pledges to build and sustain commitment in distribution channels," *Journal of Marketing Research*, vol. 29, no. 1, pp. 18-34, 1992. <https://doi.org/10.1177/002224379202900103>
- [21] F. R. Dwyer, P. H. Schurr, and S. Oh, "Developing buyer-seller relationships," *Journal of marketing*, vol. 51, no. 2, pp. 11-27, 1987. <https://doi.org/10.1177/002224298705100202>
- [22] C. Moorman, R. Deshpande, and G. Zaltman, "Factors affecting trust in market research relationships," *Journal of Marketing*, vol. 57, no. 1, pp. 81-101, 1993.
- [23] M. Yoshida, B. Gordon, M. Nakazawa, and R. Biscaia, "Conceptualization and measurement of fan engagement: Empirical evidence from a professional sport context," *Journal of Sport Management*, vol. 28, no. 4, pp. 399-417, 2014. <https://doi.org/10.1123/jsm.2013-0199>
- [24] R. W. Pimentel and K. E. Reynolds, "A model for consumer devotion: Affective commitment with proactive sustaining behaviors," *Academy of Marketing Science Review*, vol. 5, no. 1, pp. 1–45, 2004.
- [25] L. L. Jacoby, "On interpreting the effects of repetition: Solving a problem versus remembering a solution," *Journal of Verbal Learning and Verbal Behavior*, vol. 17, no. 6, pp. 649-667, 1978.
- [26] W. T. Tucker, "The development of brand loyalty," *Journal of Marketing Research*, vol. 1, no. 3, pp. 32-35, 1964.
- [27] G. S. Day, "A two-dimensional concept of brand loyalty," *Journal of Advertising Research*, vol. 9, no. 3, pp. 29-35, 1969.
- [28] J. Jacoby and D. B. Kyner, "Brand loyalty vs. repeat purchasing behavior," *Journal of Marketing Research*, vol. 10, no. 1, pp. 1-9, 1973.
- [29] K. De Wulf, G. Odekerken-Schröder, and D. Iacobucci, "Investments in consumer relationships: A cross-country and cross-industry exploration," *Journal of Marketing*, vol. 65, no. 4, pp. 33-50, 2001. <https://doi.org/10.1509/jmkg.65.4.33.18386>
- [30] R. H. Tsiotou, "The role of loyalty in the management of contemporary sports teams," *Journal of Sport Management*, vol. 26, no. 1, pp. 1–20, 2012.
- [31] A. Amine, "Consumers' true brand loyalty: The central role of commitment," *Journal of Strategic Marketing*, vol. 6, no. 4, pp. 305-319, 1998. <https://doi.org/10.1080/096525498346577>
- [32] M. Thomson, D. J. MacInnis, and W. Park, "The ties that bind: Measuring the strength of consumers' emotional attachments to brands," *Journal of Consumer Psychology*, vol. 15, no. 1, pp. 77–91, 2005. https://doi.org/10.1207/s15327663jcp1501_10
- [33] D. B. Grisaffe and H. P. Nguyen, "Antecedents of emotional attachment to brands," *Journal of Business Research*, vol. 64, no. 10, pp. 1052-1059, 2011. <https://doi.org/10.1016/j.jbusres.2010.11.002>
- [34] D. L. Wann and N. R. Branscombe, "Sports fans: Measuring degree of identification with their team," *International Journal of Sport Psychology*, vol. 24, no. 1, pp. 1–17, 1993.
- [35] D. L. Wann, *The psychology of sport fans and sport spectators*. In D. L. Wann (Ed.), *Sport Psychology*. Upper Saddle River, NJ: Prentice Hall, 1997.
- [36] Z. Zhou, Q. Zhang, C. Su, and N. Zhou, "How do brand communities generate brand relationships? Intermediate mechanisms," *Journal of Business research*, vol. 65, no. 7, pp. 890-895, 2012.
- [37] J. Lacoeuilhe, "Brand attachment: Proposal of a measurement scale," *Recherche et Applications en Marketing (French Edition)*, vol. 15, no. 4, pp. 61-77, 2000.
- [38] J. Lacoeuilhe, "Contribution to the study of affective factors in the explanation of repetitive purchasing behavior: Towards an integrative approach to brand loyalty," presented at the Congress of the French Marketing Association, 1998.
- [39] J. Mercier and E. Roux, "Brand attachment: one-dimensional or three-dimensional measurement?," *Aix-Marseille Center for Management Study and Research*, pp. 1-38, 2017.
- [40] L. C. Harris and E. Ogbonna, "The dynamics underlying service firm—customer relationships: Insights from a study of English premier league soccer fans," *Journal of Service Research*, vol. 10, no. 4, pp. 382-399, 2008. <https://doi.org/10.1177/1094670508314711>
- [41] C. C. Bee and M. E. Havitz, "Exploring the relationship between involvement, fan attraction, psychological commitment and behavioural loyalty in a sports spectator context," *International Journal of Sports Marketing and Sponsorship*, vol. 11, no. 2, pp. 37-54, 2010. <https://doi.org/10.1108/IJMS-11-02-2010-B004>
- [42] M. P. Pritchard, M. E. Havitz, and D. R. Howard, "Analyzing the commitment-loyalty link in service contexts," *Journal of the Academy of Marketing Science*, vol. 27, pp. 333-348, 1999.

- [43] G. Bodet, "Loyalty in sport participation services: An examination of the mediating role of psychological commitment," *Journal of Sport Management*, vol. 26, no. 1, pp. 30-42, 2012. <https://doi.org/10.1123/jsm.26.1.30>
- [44] Y. Iwasaki and M. E. Havitz, "A path analytic model of the relationships between involvement, psychological commitment, and loyalty," *Journal of Leisure Research*, vol. 30, no. 2, pp. 256-280, 1998.
- [45] J. Steuer, "Defining virtual reality: dimensions detaming telepresence," *Journal of Communication*, vol. 42, pp. 73-93, 1992.
- [46] E. J. Downes and S. J. McMillan, "Defining interactivity: A qualitative identification of key dimensions," *New Media & Society*, vol. 2, no. 2, pp. 157-179, 2000. <https://doi.org/10.1177/14614440022225751>
- [47] E. Glebova and P. Desfontaine, *Sport and digital technologies: towards new spectator experiences*. In M. Desbordes & C. Hautbois (Eds.), *Management du Sport 3.0: Spectacle, Fan Experience, Digital*. Paris: Economica, 2020.
- [48] C. Grönroos, "Creating a relationship dialogue: Communication, interaction and value," *The Marketing Review*, vol. 1, no. 1, pp. 5-14, 2000. <https://doi.org/10.1362/1469347002523428>
- [49] L. Seomgyun, K. R. Kim, and M. Kang, "Reciprocal communication in sports: Impact on fan loyalty and the reputation of sports organizations," *International Journal of Sport Communication*, vol. 16, no. 2, pp. 123-137, 2022. <https://doi.org/10.1123/ijsc.2022-0056>
- [50] H. H. Bauer, N. E. Stokburger-Sauer, and S. Exler, "Brand image and fan loyalty in professional team sport: A refined model and empirical assessment," *Journal of Sport Management*, vol. 22, no. 2, pp. 205-226, 2008. <https://doi.org/10.1123/jsm.22.2.205>
- [51] N. D. Theodorakis, K. Alexandris, N. Tsigilis, and S. Karvounis, "Predicting spectators' behavioural intentions in professional football: The role of satisfaction and service quality," *Sport Management Review*, vol. 16, no. 1, pp. 85-96, 2013.
- [52] J. F. Hair, C. M. Ringle, and M. Sarstedt, "PLS-SEM: Indeed a silver bullet," *Journal of Marketing Theory and Practice*, vol. 19, no. 2, pp. 139-152, 2011.
- [53] J. F. Hair, G. T. M. Hult, C. M. Ringle, and M. Sarstedt, *A primer on partial least squares structural equation modeling (PLS-SEM)*. Thousand Oaks, CA: SAGE Publications, 2014.
- [54] J. Hair, C. L. Hollingsworth, A. B. Randolph, and A. Y. L. Chong, "An updated and expanded assessment of PLS-SEM in information systems research," *Industrial Management & Data Systems*, vol. 117, no. 3, pp. 442-458, 2017.
- [55] J.-J. Croutsche, "Study of causal relationships: Use of structural equation models (methodological approach)," *La Revue des Sciences de Gestion: Direction et Gestion*, vol. 198, pp. 81-97, 2002.
- [56] J. J. Croutsche, *Data analysis in marketing, management and social sciences: conceptualization and applications*. Paris: Editions ESKA, 2009.
- [57] B. Dwyer, M. Mudrick, G. P. Greenhalgh, C. W. LeCrom, and J. Drayer, "The tie that blinds? Developing and validating a scale to measure emotional attachment to a sport team," *Sport Management Review*, vol. 18, no. 4, pp. 570-582, 2015. <https://doi.org/10.1016/j.smr.2015.01.001>
- [58] P. Zagnoli and E. Radicchi, "The football fan community as a determinant stakeholder in value co-creation," *Physical Culture and Sport. Studies and Research*, vol. 50, no. 1, pp. 79-99, 2010. <https://doi.org/10.2478/v10141-010-0026-9>
- [59] V. Ratten, A. Donato, and L. Nardo, "Interactivity and sports marketing: The role of technology in enhancing fan engagement," *Journal of Sport Management*, vol. 25, no. 5, pp. 431-453, 2011. <https://doi.org/10.1123/jsm.25.5.431>
- [60] R. Giulianotti, "Supporters, followers, fans, and flaneurs: A taxonomy of spectator identities in football," *Journal of Sport & Social Issues*, vol. 26, no. 1, pp. 25-46, 2002. <https://doi.org/10.1177/0193723502261003>
- [61] T. Bouzdine-Chameeva, A. Ferrand, P. Valette-Florence, and N. Chanavat, "Measurement and segmentation of sport fans using brand association networks: Application to union of European football associations (UEFA) champions league (UCL)," *Sport Management Review*, vol. 18, no. 3, pp. 407-420, 2015.