

Transforming sport consumption: exploring motivated sport fans innovativeness in the context of AR live sport streaming

Sungkyung Kim

Faculty of Health Sciences and Sport, University of Stirling, Stirling, UK, and

Argyro Elisavet Manoli

Department of Management, University of Bergamo, Bergamo, Italy

Abstract

Purpose – This study delves into the psychological processes underlying sport fans' post-purchase innovativeness behaviour. This exploratory research aims to establish a theoretical framework that elucidates the formation of sport fans' word-of-mouth (WOM) behaviours, particularly emphasising the structural relationship between motivated consumer innovativeness and satisfaction in using AR live-streaming services.

Design/methodology/approach – Utilising an online survey and convenience sampling, the study garnered a total of 243 usable responses from three online baseball fan communities in South Korea. Confirmatory factor analysis was employed to assess the psychometric properties of the constructs. Subsequently, a structural equation model was used to probe the influence of motivated consumer innovativeness on WOM, with a particular focus on the mediating role of satisfaction.

Findings – Three dimensions of motivated sport fans innovativeness – functional, hedonic and cognitive – showed a positive association with WOM, partly mediated by satisfaction. In contrast, socially motivated sport fans innovativeness did not directly lead to WOM but influenced it solely through satisfaction. The full mediating role of satisfaction in the relationship between socially motivated fans innovativeness and WOM was found.

Originality/value – This research stands out as one of the scant studies exploring motivated sport fans innovativeness in the context of AR live sport streaming. The findings not only corroborate but also augment the extant literature by empirically confirming that three dimensions of motivated fans innovativeness, coupled with satisfaction, are pivotal antecedents to WOM intention.

Keywords Satisfaction, Artificial intelligence, Virtual reality, Augmented reality, Positive word-of-mouth, Motivated consumer innovativeness

Paper type Research paper

Introduction

Augmented reality (AR) technologies undoubtedly emerged as one of the most rapidly growing innovations with the development of smartphones and information technology for sport spectators (e.g. the Internet of things (IoT) and artificial intelligence (AI); Kim and Ko, 2019). AR integrates computer-generated objects with the real world, enabling real-time interactions, and is regarded as an important marketing tool (Liao, 2015). In this light, AR has been defined as a “medium in which digital information is overlaid on the physical world [...] that is interactive in time” (Craig, 2013, p. 20). AR in sport is a technology that places digital information such as graphics and data (e.g. players stats and replays) on top of what a user



sees in the real world, adding more details to the live sports experience (Goebert and Greenhalgh, 2020).

As such, and due to its potential, this technological innovation changed the way in which sport is consumed. For instance, the National Basketball Association (NBA) and the Women's National Basketball Association (WNBA) recently launched AR and virtual reality (VR) live streaming service subscriptions allowing fans to have the ability to view play-by-play commentary and enjoy the live game with virtual friends (Shim, 2023). At the same time, the advancement of technology has also led to the flourishing culture of indoor golf such as screen golf lounges and training apps using AR and VR techniques (Jo, 2021). AR combined with AI-driven tools has revolutionised golf, offering real-time swing analysis and the opportunity for users to compete in live matches, advancing the way sports are consumed (Kim, 2021). The enthusiastic adoption of the Metaverse by sports teams is poised to radically alter the fan experience, a change that is widely anticipated to be profound (Walker, 2023).

Regarding the importance of AR live streaming research, sport has consistently been at the forefront of adopting new technologies. This trend is supported by the propensity of sport fans to embrace technological innovations for enhanced viewing experiences (Ratten and Ferreira, 2016). AR live streaming could be a prime example of this, offering an interactive and immersive platform that enriches the fan experience. Given the paradigm shift involving AR technologies in live sport streaming (Marr, 2020; Walker, 2023), it is crucial for sports teams and marketers to anticipate the implications of AR live streaming and understand how and why fans interact with AR, underscoring the need for this timely study. While studies across various marketing disciplines have actively explored AR applications in areas such as online retail and shopping (e.g. Hilken *et al.*, 2017; Jiang *et al.*, 2021), its use among sports fans remains less examined, marking this a critical area that our study seeks to illuminate.

At the same time, while consuming sports through AR is poised to become popular, scant research has been conducted to understand sports fans' innovativeness in relation to these technological advancements. This is where the power of positive word-of-mouth (WOM) becomes a critical catalyst. Existing marketing literature has extensively discussed the vital role of WOM in the adoption of new products, as early adopters' reviews and their WOM can impact followers' purchase decision-making process (e.g. Pang, 2021; Popp and Woratschek, 2017). Indeed, positive WOM is recognised as a significant factor in technology adoption (e.g. Maduku *et al.*, 2023; Mishra *et al.*, 2022). Despite the understanding that fans' motivations can significantly shape their experience and subsequent communication about them (e.g. sharing their experience and recommending it to others), our knowledge remains limited regarding which fans' motivated innovativeness factors contribute to positive WOM in the context of AR experiences in sport. In particular, research is yet to explore in detail such associations in the post-experience phase. Additionally, the role of satisfaction towards sport fans' AR experiences in this relationship remains unclear, despite the significant influence of satisfaction on the pathway from motivation to WOM which is understood in other research domains (e.g. Han and Hyun, 2018). Thus, the current study poses the following research questions:

- RQ1. How does the motivated sport fans innovativeness impact on formulating positive WOM?
- RQ2. What role does satisfaction with AR play in the link between the motivated sport fans innovativeness and their WOM intention?

To answer these research questions, this study aims to explicate the psychological process of sport fans innovativeness post-purchase behaviour. Specifically, this rather exploratory study focuses on building a firm theoretical framework explaining sport fans' WOM formation by considering the interrelationships between motivated consumer innovativeness

and satisfaction. Therefore, the present study attempts to provide a deeper understanding of what motivates sport fans' innovative buying behaviour, aiming to acquire important insights to how this can be used in the future of sport content consumption. It also contributes to the wider sport fan motivation research by focusing on a new technology not previously examined in the literature, thus offering both theoretical and practical implications.

Literature review and hypotheses development

Motivated consumer innovativeness

Motivated consumer innovativeness (hereafter MCI), encompassing both internal and external factors that shape consumers' innovative buying behaviour, has been employed to explicate the adoption of new technologies (Hwang *et al.*, 2019). The concept refers to the degree to which consumers are inclined to adopt innovative products or services based on multiple motivations. The technology acceptance model (Davis, 1989) and diffusion of innovations theory (Rogers, 1983) are the staple theories that have been widely employed to understand how consumers adopt new technologies. MCI stems from these two theories (Hong *et al.*, 2017). Davis (1989) initially built the technology acceptance model to explicate the formation of consumer innovative buying decisions, employing two main determinants of attitude, which in turn affect behavioural intention: perceived ease of use and perceived usefulness. Rogers (1983) first established the diffusion of innovations theory to explain the patterns and speed at which products and new technologies are disseminated, introducing the adoption curve: innovators, early adopters, early majority, late majority and laggards. Whilst both theories have been successfully applied across various research fields to comprehend and predict sport fans' purchasing behaviour (Byun *et al.*, 2018), they fall short in elucidating the "why" behind consumer behaviour (Hwang *et al.*, 2019), particularly in the context of innovativeness in adopting new technologies. For this reason, scholars conceptualised and developed a measurement of MCI that has a motivational point of view on consumer innovativeness, capturing a wider spectrum of motivation in the new product decision-making process (Hwang *et al.*, 2020; Reinhardt and Gurtner, 2015).

Existing literature generally concurs on the multidimensionality of MCI (e.g. Hwang *et al.*, 2020; Reinhardt and Gurtner, 2015; Vandecasteele and Geuens, 2010), which includes (a) functionally motivated consumer innovativeness (*fMCI*), (b) hedonically motivated consumer innovativeness (*hMCI*), (c) socially motivated consumer innovativeness (*sMCI*) and (d) cognitively motivated consumer innovativeness (*cMCI*). The concept of *fMCI* is derived from the perceived usefulness element of the technology acceptance model, whilst *cMCI* aligns with the model's perceived ease of use component.

Specifically, *fMCI* refers to consumer innovativeness that is motivated by the functional performance of new products focusing on the practical and task management aspects (Vandecasteele and Geuens, 2010). The functional motivation that leads to innovative buying behaviour is concerned with efficient, goal-oriented and practical purpose, which suggests a consumer is more likely to consider innovativeness when the product is viewed to be helpful for achieving productivity and improving performance (Hong *et al.*, 2017; Hwang *et al.*, 2019).

Second, *hMCI* is defined as "consumer innovativeness motivated by affective or sensory stimulation and gratification" (Vandecasteele and Geuens, 2010, p. 310). It is important to differentiate between the sensory gratification of *hMCI* and satisfaction within this study. *hMCI* represents the initial impetus for engagement, whereas satisfaction constitutes the subsequent evaluation of the experience. Roehrich (2004) regards hedonic motivated innovativeness as a strong predictor of adopting products for affective goals, such as experiencing feelings of joy and satisfaction. So, *hMCI* is considered to be a more subjective dimension than *fMCI* due to the fact that hedonic motivation is closely associated with sensory and emotional arousal (Chua *et al.*, 2019). A consumer who has a strong *hMCI* is more

likely to use the newness of a product or service to pursue a playfulness experience (Hwang *et al.*, 2019; Reinhardt and Gurtner, 2015). Consumers with high levels of hedonically innovative motivation to use a new technology have a desire for escaping from daily life to seek sensory gratification and enjoyment (Vandecasteele and Geuens, 2010).

However, new products are not always purchased for their functional and hedonic motivations. The third dimension of MCI is *cMCI*, which is deeply related to consumers' cognitive goals, such as mental stimulation (Venkatraman and Price, 1990). Consumers with cognitively innovative motivation seek intellectual stimulation through the experience with new technology (Vandecasteele and Geuens, 2010). A consumer who has high levels of *cMCI* is likely to pursue eagerness to learn that satisfies their analytic mind and to unpack the advantages and disadvantages of innovative products (Hwang *et al.*, 2020).

On the other hand, innovativeness studies paid attention to the social component of consumer innovativeness, which is the fourth dimension of MCI. *sMCI* is conceptualised as "consumer innovativeness motivated by the self-assertive social need for differentiation" (Vandecasteele and Geuens, 2010, p. 310). This dimension posits that one of the most important reasons consumers use new technology products or services is to impress others so that they can strengthen their self-image (Hwang *et al.*, 2020). This motivation has been consistently identified and suggested that consumers tend to use new technology to present themselves to friends in a particular way while showing off their social status and differentiating themselves from others (Reinhardt and Gurtner, 2015). In summary, MCI is a complex concept which contains many motivational orientations (e.g. intrinsic and extrinsic motivations) for achieving a variety of goals (e.g. task goals, affective goals, social relationship goals and cognitive goals). For example, intrinsic motivation, which refers to the inherent pleasure an individual gains from the activity itself (Ryan and Deci, 2000), can be considered *hMCI*, whereas extrinsic motivation, which is derived from external rewards such as gaining social recognition (Ryan and Deci, 2000), can be viewed as *sMCI* in this study.

Impact of motivated consumer innovativeness

The motivation-satisfaction relationship has gained considerable attention as sport fans' overall satisfaction has proven to have a positive impact on sport fans' post-experience outcomes (e.g. Bodet and Bernache-Assollant, 2011; Lee and Kang, 2015). Therefore, efforts to understand the underlying mechanism of satisfaction formation as an outcome of fans' motivated innovativeness have been made. The needs-based approach in the examination of motivation (e.g. hierarchical needs theory and classification of needs theory) and expectancy theory (Vroom, 1964) suggest that satisfaction occurs when a consumer's motivational goals and the fulfilment of their goals are matched (Albayrak and Caber, 2018). Such a perspective enables researchers to illuminate which motivations contribute to fans' satisfaction.

Although the MCI-satisfaction relationship is exploratory in nature, the following lines of research lead this study to expect that MCI would positively affect satisfaction towards innovative buying experiences. Many empirical studies from various research domains have supported that consumer motivations are a primary determinant of customer satisfaction (e.g. Han and Hyun, 2018; Kim and Ko, 2019; Lee *et al.*, 2014). Han and Hyun (2018) investigated the impact of travel motivations for luxury cruise travelling, which include (a) self-esteem and social recognition, (b) escape and relaxation, (c) learning, discovery, and thrill, and (d) bonding dimensions, on satisfaction. Their results revealed that cruise tourism motives elicited travellers' satisfaction. In the event management context, Lee *et al.* (2014) found that only the intrinsic motivation of volunteers has a positive effect on satisfaction. Kim and Ko's (2019) study also provides support for inferring the relationship between MCI and satisfaction. Kim and Ko (2019) investigated sport fans' satisfaction with VR technology formation by considering the role of flow experience, which shares similar characteristics of

hedonic and cognitive MCI dimensions in this study. The result confirmed that the flow experience of VR spectatorship was found to significantly strengthen fans' satisfaction. It is, thus, logical to assume that fans' satisfaction towards AR technology experience can be better predicted by motivation.

A critical consideration when examining the relationship between motivated consumer innovativeness and satisfaction is the timing of motivation measurement. Considering the fact that satisfaction typically emerges post-consumption of products or services, while motivation occurs at the initial stage of the decision-making process since motivation is a psychological need or desire that stimulates actual behaviour (Albayrak and Caber, 2018), a careful definition of the measurement time of MCI is required. In this study, MCI is considered to be a post-experience motivation and thus the past tense version of measurement items is used while present tense is used for measuring satisfaction. Albayrak and Caber's (2018) study offers empirical evidence that motivation measured post-experience is a stronger determinant of satisfaction than pre-experience motivation. Taking all the above into consideration, the following hypotheses are formed:

- H1a.* Functionally motivated consumer innovativeness is positively associated with satisfaction.
- H1b.* Hedonically motivated consumer innovativeness is positively associated with satisfaction.
- H1c.* Cognitively motivated consumer innovativeness is positively associated with satisfaction.
- H1d.* Socially motivated consumer innovativeness is positively associated with satisfaction.

As the influence of individual consumers expands with the emergence of smart consumers (Roy *et al.*, 2022), the importance of WOM becomes more pronounced than ever before. Empowered by digitalisation, smart consumers engage not only in seeking and sharing information but also in fostering a sense of community and building social networks, which aid in making informed and reasoned purchasing decisions (Kim *et al.*, 2020). Positive WOM is a good promoter of a product or service, increasing awareness for those who are not familiar with the product or service (Pang, 2021). WOM is defined as "informal, person-to-person communication between a perceived non-commercial communicator and a receiver regarding a brand, a product, an organisation, or a service" (Harrison-Walker, 2001, p. 63). This non-commercial and informal communication is often considered a more reliable information source than marketer-created information for the consumers' decision-making process (Bickart and Schindler, 2001). Although many studies consider WOM as a sub-dimension or an integral part of customer loyalty (e.g. Jones and Taylor, 2007), the current study separates WOM from loyalty to focus exclusively on WOM. Additionally, the concept of WOM in this study incorporates both verbal and online WOM intention.

In the present research, motivated consumer innovativeness is posited as a precursor to WOM intention, and this postulation is underpinned by empirical research. Yoo *et al.* (2013) confirmed that *sMCI* and *hMCI* were positively and directly associated with WOM intention towards using innovative agricultural products. While extant literature offers limited evidence for a direct association between MCI and WOM, several studies provide indirect insights. Ismagilova *et al.* (2021) synthesised results from previous studies on online WOM behaviours using meta-analysis to address their research question of which factors are related to fans' WOM. They covered 20 factors under four conditions to examine factors affecting WOM in the analysis: perceptual conditions (e.g. opinion seeking and information

usefulness), consumption-based conditions (e.g. involvement and loyalty), personal conditions (e.g. altruism and affective commitment), and social conditions (e.g. influence of others and information influence). Additionally, [Mishra et al. \(2022\)](#) uncovered that hedonic and utilitarian values positively affect WOM for smart voice assistants. These facets of motivation resonate with the four dimensions of MCI. Building on this discussion, it is postulated that the four dimensions of motivated consumer innovativeness are associated with WOM intention:

- H2a.* Functionally motivated consumer innovativeness is associated with positive word-of-mouth intention.
- H2b.* Hedonically motivated consumer innovativeness is associated with positive word-of-mouth intention.
- H2c.* Cognitively motivated consumer innovativeness is associated with positive word-of-mouth intention.
- H2d.* Socially motivated consumer innovativeness is associated with positive word-of-mouth intention.

Satisfaction and its impact

As the era of relationship marketing has arrived, customer satisfaction towards services has become an essential measuring indicator for overall marketing performance ([Jones and Suh, 2000](#)). Satisfaction is widely defined as “a judgment that a product or service feature, or the product or service itself, provided (or is providing) a pleasurable level of consumption fulfilment, including the levels of under or over fulfilment” ([Oliver, 1997](#), p. 13). Definitions of satisfaction discussed in the marketing literature suggest that the concept is a subjective and psychological outcome that occurs through a process in which an individual compares his or her expectations to their actual experience. With this regard, satisfaction is a concept stemming from the expectancy-disconfirmation paradigm ([Oliver, 1999](#)). This paradigm postulates that satisfaction or dissatisfaction are determined by positive or negative gaps between expectancy and post-experience levels ([Oliver, 1999](#)).

Customer satisfaction comprises two main aspects: overall satisfaction and transaction-specific satisfaction. Scholars tend to share two dissimilar views on satisfaction, distinguishing overall satisfaction (i.e. cumulative satisfaction) from transaction-specific satisfaction (e.g. [Bitner and Hubbert, 1994](#); [Jones and Suh, 2000](#); [Olsen and Johnson, 2003](#)). The concept of overall satisfaction is a cumulative evaluation of experiences that consumers felt from the supplying organisation or certain product, while the concept of transaction-specific satisfaction captures the complex psychological reactions over a given time ([Olsen and Johnson, 2003](#); [Jones and Suh, 2000](#)). This study adopts the notion of transaction-specific satisfaction, operationally defining satisfaction as a post-choice evaluative judgement concerning the AR service, specifically measured at the time of experiencing live sport.

The satisfaction-WOM intention is a well-established link. The link is often explained as “the consumers’ response to the evaluation of the perceived discrepancy between prior expectations (or some other norm of performance) and the actual performance” ([Tse and Wilton, 1988](#), p. 204). Satisfaction has a stronger relationship with WOM than loyalty in some contexts ([De Matos and Rossi, 2008](#)). Empirical studies on customer behaviour found evidence of a positive link between satisfaction and positive WOM intentions across various contexts (e.g. [Konuk, 2019](#); [Pang, 2021](#); [Popp and Woratschek, 2017](#); [Xu et al., 2015](#)). In the context of sports, [Santini et al. \(2021\)](#) demonstrate in their meta-analysis that satisfaction is a

crucial determinant of sport fans' positive behavioural intentions, reinforcing its pivotal role in fan engagement and advocacy.

In research in luxury brand marketing, AR application experience satisfaction for luxury brands was identified as an antecedent of WOM (Nawres *et al.*, 2024). From an app user's IT behaviour, Xu *et al.* (2015) explored the effect of satisfaction on positive WOM intentions in an attempt to explicate why people recommend apps to others. Their results revealed that app users' satisfaction has a significant direct influence on willingness to make recommendations to others (Xu *et al.*, 2015). In a similar vein, Pang (2021) found that users' satisfaction with mobile social media is an important predictor of their electronic WOM engagement. The result is consistent with the brand management and customer service contexts. Popp and Woratschek (2017) illustrated the positive link between customer satisfaction and positive brand WOM, while Konuk (2019) confirmed the influence of customer satisfaction on WOM intentions in the context of organic food restaurants. Although the association between satisfaction and WOM in the context of sport fans' AR use has yet to be thoroughly investigated, the empirical findings discussed above allow us to propose:

- H3. Sport fans' satisfaction with AR live consumption experience has a positive impact on WOM.

The partial mediator role of satisfaction

A body of research exists primarily centred on how motivational constructs directly influence consumer behavioural intentions, revealing inconsistent findings across research (e.g. Fagan *et al.*, 2008). The inconsistent findings in previous literature regarding the direct relationship between consumer motivation and WOM in the context of sports fans' behaviour suggest that a mediating variable may better explain this relationship. The present study posits that satisfaction is a potential mediating variable that could reconcile these inconsistencies.

Extant studies on technology acceptance and usage further highlight the important role of satisfaction, positioning it as a significant mediator between motivations and behavioural intentions (e.g. Kim *et al.*, 2022). Although WOM and behavioural intention are not identical, there is a conceptual overlap, especially regarding the expressive intention to recommend or share information about a product or service, which is a central element of WOM. Kim *et al.* (2022), for example, confirmed the mediating role of satisfaction of digital self-service technology (i.e. digital ticketing) in sport, between intrinsic motivation and behaviour intention. Drawing upon the Unified Theory of Acceptance and Use of Technology, Vieira *et al.* (2022) conducted a meta-analytical review to formulate a framework positioning AR dimensions (e.g. informativeness, perceived usefulness, aesthetics and enjoyment) as precursors with satisfaction as a mediator, leading to behavioural intention. A meta-analysis of 58 studies confirmed the main effect of AR dimensions that explain the motivations driving consumers to use AR on behavioural intentions as well as its indirect effect via satisfaction. These insights underscore the conceptual necessity of incorporating satisfaction when examining sport fans' AR engagement and their WOM intention.

By using these empirical results in our research, we propose that satisfaction plays a similar role in partially mediating the relationship between the various dimensions of motivated consumer innovativeness and WOM. Thus, the present study established the following hypotheses (see Figure 1):

- H4a. Satisfaction with AR experience would partially mediate the relationship between functionally motivated consumer innovativeness and WOM
- H4b. Satisfaction with AR experience would partially mediate the relationship between hedonically motivated consumer innovativeness and WOM

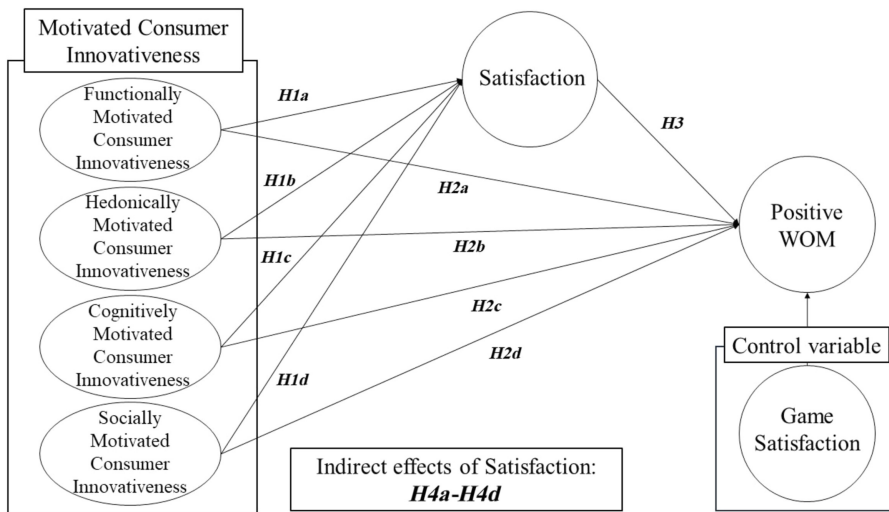


Figure 1.
The research framework of the current study

Source(s): Authors own creation

- H4c.* Satisfaction with AR experience would partially mediate the relationship between cognitively motivated consumer innovativeness and WOM
- H4d.* Satisfaction with AR experience would partially mediate the relationship between socially motivated consumer innovativeness and WOM

Methods

Sampling and data collections

The sample population of the current study is baseball fans in South Korea, a demographic that has been at the forefront of experiencing the surge in AR sport live streaming services, especially baseball games. This population, sport fans in South Korea, is also known to be sensitive to trends while possessing a noteworthy purchasing power (Shan, 2023). At the same time, since 2019, major IT companies in the country have actively promoted AR technology, making it increasingly attractive to the baseball audience as an alternative viewing experience (Shim, 2020). Consequently, a substantial number of baseball fans in the country would have likely encountered AR live streaming services, whether at baseball stadiums or via experiential marketing and promotional events (e.g. Sohn, 2017).

Given the study's objective to examine post-AR experience motivation and satisfaction, an online survey was selected as the most suitable approach to access this specific sample population. Online fan communities form a significant aspect of sports fan culture in the country, boasting substantial membership numbers (Kim and Manoli, 2023). Data were gathered from members of three online baseball fan communities using web-based questionnaires (Qualtrics) and a convenience sampling approach. With the support of community managers, the survey was made accessible to all community members by posting it on the notice board. The current study utilised G*Power software for *a priori* power analysis to determine the necessary sample size (Faul *et al.*, 2009). Using a minimum level of power of 0.80 and a medium effect size $f^2 = 0.15$ at an alpha level of 0.05, the target sample size for this study was reported to be 154. The questionnaire was available from 30th May to 13th June 2021,

yielding a total of 243 useable responses, which met the minimum sample size. Uniform or incomplete answers were excluded from the study.

Item measurement and pretesting

This study's survey questionnaire comprises of three sections: (a) a description of the research aims and completion guidelines; (b) 18 measurement items for the assessment of six latent constructs; and (c) questions capturing participants' sociodemographic details. A seven-point Likert scale was utilised for item measurement ("Strongly disagree [1]" – "Strongly agree [7]").

Multiple-item measurement scales, which had been developed and validated by prior studies, were used to measure the six constructs. To evaluate the four dimensions of MCI, the current study adopted items from [Vandecasteele and Geuens \(2010\)](#). Satisfaction (transaction-specific) and WOM intention were measured using the instruments from [Bodet \(2008\)](#) and [Hwang et al. \(2020\)](#) respectively. The questionnaire incorporated a screening question regarding their previous experiences with AR technology in consuming baseball live streaming (i.e. Have you used AR technology to watch live baseball streaming in the past 12 months?). Those not meeting the criterion were precluded from participating in the survey. The questionnaire also included quality control questions such as prompting participants to choose a specific number to filter out disengaged responses. Lastly, since the sample population uses Korean as their main language, the items were translated using a back-translation technique by two bilingual experts in sport management research ([Brislin, 1970](#)). The initial translation into Korean was performed by the first, while the back-translation to English was carried out by the second. Then, both versions were compared to ensure and confirm their equivalence.

The validity of the measurement items was assessed through content validity tests as a pretesting process. For content validity, three experts in the academic field of sport marketing and management with doctoral qualifications in the United Kingdom were chosen to review the English version of the questionnaire. In a similar vein, two experts meeting the same criteria were selected to review the Korean version. These experts reviewed the phrasing of the measurement items and the overall structure of the questionnaire.

Control variable

Several sport management studies distinguish service satisfaction from game satisfaction (e.g. [Yoshida et al., 2015](#)). Game satisfaction is the concept that specifically measures the overall satisfaction with the game experience of a sport consumer. Empirical studies revealed that the game satisfaction was also found to positively affect WOM intentions (e.g. [Yoshida and James, 2010](#)). To avoid the effect of psychological experience with game results toward WOM intentions, participants' game satisfaction was controlled as a covariate in the analysis to rule them out as alternative explanations. This study borrowed the three items of game satisfaction from [Yoshida and James' \(2010\)](#) research.

Common method bias

Given the cross-sectional nature and utilising a seven-point Likert scale across the measures, the possibility of common method bias is acknowledged. To address potential bias, this study followed [Podsakoff et al.'s \(2003\)](#) recommendations, ensuring respondent anonymity to lessen social desirability and refining item phrasing for clarity. Additionally, Harman's single-factor test was also employed to assess common method variance. The results showed that one factor explained for only 38.55% of the covariance, well below the critical 50% threshold, indicating that common method bias is not a predominant issue in this study ([Podsakoff et al., 2003](#)).

Results

The data were analysed in three phases: preliminary analysis, confirmatory factor analysis (CFA) and structural equation modelling (SEM). SPSS 27.0 and AMOS 27.0 were used to perform the data analysis. A two-step procedure (Anderson and Gerbing, 1988) using structural equation modelling was applied to assess the quality of the measurement model and to assess the established hypotheses in the structural model.

Preliminary analysis

To examine normality and detect outliers, skewness, kurtosis and Z-scores were calculated (Hair *et al.*, 2010). Skewness values ranged between -0.95 and -0.47 , while kurtosis values spanned from -0.42 to 0.41 , indicated that there is no normality issue in the responses (see Table 1). Of the 243 valid samples, 20 respondents had Z-scores beyond $+2$ or below -2 , marking them outliers. For the integrity of the subsequent analyses, these outliers were excluded from further analysis.

Reliability and validity assessment

The psychometric properties of the measurements were checked using CFA. The fit indices of the measurement model correspond well with the data and meet the criteria set by Hair *et al.* (2010) ($\chi^2/df = 1.73$, RMR = 0.07, GFI = 0.90, NFI = 0.95, TLI = 0.96, CFI = 0.97,

Items	Mean	SD	Skewness	Kurtosis
<i>Functionally motivated consumer innovativeness ($\omega = 0.93$)</i>				
fMCI1: efficient	5.33	1.41	-0.69	0.02
fMCI2: convenient	5.12	1.54	-0.57	-0.39
fMCI3: shortening travel time	5.23	1.48	-0.69	-0.19
<i>Hedonically motivated consumer innovativeness ($\omega = 0.93$)</i>				
hMCI1: exciting	5.27	1.57	-0.79	0.01
hMCI2: enjoyment	5.40	1.42	-0.70	-0.27
hMCI3: good feeling	5.42	1.48	-0.90	0.41
<i>Cognitively motivated consumer innovativeness ($\omega = 0.89$)</i>				
cMCI1: considering various aspects	5.56	1.37	-0.81	0.01
cMCI2: thinking logically	5.55	1.44	-0.95	0.22
cMCI3: comparing pros and cons	5.45	1.41	-0.76	-0.07
<i>Socially motivated consumer innovativeness ($\omega = 0.87$)</i>				
sMCI1: distinguishing from others	5.54	1.34	-0.73	-0.20
sMCI2: showing as an early adopter	5.29	1.55	-0.80	0.25
sMCI3: impressing others	5.38	1.48	-0.73	-0.05
<i>Satisfaction ($\omega = 0.95$)</i>				
Satis1: I am satisfied with my decision to AR at that time	5.17	1.44	-0.62	0.03
Satis2: I think that I did the right thing by deciding to use AR at that time	5.11	1.44	-0.62	0.17
Satis3: My choice to use AR at that time was a wise one	5.16	1.42	-0.47	-0.31
<i>Words-of-mouth (WOM) intention ($\omega = 0.95$)</i>				
WOM1: I am likely to say positive things about AR	5.02	1.55	-0.59	-0.23
WOM2: I am likely to recommend AR to others	5.04	1.62	-0.58	-0.41
WOM3: I am likely to encourage others to use AR	5.06	1.70	-0.67	-0.42

Note(s): ω indicates McDonald's Omega coefficients; SD denotes standard deviation

Source(s): Authors' own creation

Table 1.
Descriptive statistics,
normality and internal
consistency of the
measurement items

RMSEA = 0.05). To assess reliability, two indicators were utilised: McDonald's Omega and composite reliability (CR). The McDonald's Omega coefficients for the latent variables ranged from 0.87 to 0.95, exceeding the 0.70 benchmark set by Peters (2014), showcasing satisfactory internal consistency for all variables. In a similar vein, CR values, ranging from 0.86 to 0.95, surpassed the recommended 0.70 threshold (Hair et al., 2010), further confirming the internal consistency of the constructs (refer to Table 2).

Convergent and discriminant validity were ascertained using average variance extracted (AVE) evaluations. AVE values for the latent variables, ranging from 0.67 to 0.87, surpassed the threshold of 0.50 (Hair et al., 2010), indicating adequate convergent validity. Additionally, all the standardised factor loadings of the measurement items were significant at $p < 0.001$ and surpassed the 0.707 threshold (Hair et al., 2010; see Table 2). For discriminant validity, the square root of each construct's AVE value exceeded its correlation coefficients with other related constructs (Fornell and Larcker, 1981), signifying distinctiveness of the latent variables (see Table 3).

Measurement items	Reliability		Convergent validity	
	ω	CR	β (<i>t</i> -value)	AVE
<i>Functionally motivated consumer innovativeness</i>				
fMCI1	0.93	0.93	0.89 [*] (21.10)	0.81
fMCI2			0.90 [*] (21.68)	
fMCI3			0.92 [*] (–)	
<i>Hedonically motivated consumer innovativeness</i>				
hMCI1	0.93	0.94	0.89 [*] (21.53)	0.83
hMCI2			0.93 [*] (23.92)	
hMCI3			0.90 [*] (–)	
<i>Cognitively motivated consumer innovativeness</i>				
cMCI1	0.89	0.88	0.86 [*] (18.52)	0.72
cMCI2			0.75 [*] (14.69)	
cMCI3			0.93 [*] ()	
<i>Socially motivated consumer innovativeness</i>				
sMCI1	87	0.86	0.74 [*] (13.98)	0.67
sMCI2			0.87 [*] (16.17)	
sMCI3			0.76 [*] (–)	
<i>Satisfaction</i>				
Satis1	0.95	0.95	0.94 [*] (26.25)	0.87
Satis2			0.95 [*] (26.94)	
Satis3			0.92 [*] (–)	
<i>Words-of-mouth (WOM) intention</i>				
WOM1	0.95	0.94	0.93 [*] (26.90)	0.86
WOM3			0.93 [*] (26.72)	
WOM3			0.92 [*] (–)	

Note(s): $p < 0.001^*$
 ω = McDonald's Omega; β = Standardized factor loading; AVE = average variance extracted
Goodness-of-fit statistics: $\chi^2/\text{df} = 1.73$, $p < 0.001$, RMR = 0.07, GFI = 0.90, NFI = 0.95, TLI = 0.96, CFI = 0.97, RMSEA = 0.05
Source(s): Authors' own creation

Table 2.
Results of reliability
and convergent
validity tests

	fMCI (SD1.38)	hMCI (SD = 1.40)	cMCI (SD = 1.27)	sMCI (SD = 1.30)	Satis (SD = 1.37)	WOM (SD = 1.55)	AVE	Motivated sport fans innovativeness in AR
fMCI (M = 5.23)	<i>0.90</i>						0.81	455
hMCI (M = 5.36)	0.79	<i>0.91</i>					0.83	
cMCI (M = 5.52)	0.73	0.71	<i>0.85</i>				0.72	
sMCI (M = 5.40)	0.69	0.82	0.63	<i>0.82</i>			0.67	
Satis (M = 5.15)	0.75	0.83	0.73	0.80	<i>0.93</i>		0.87	
WOM (M = 5.04)	0.75	0.87	0.63	0.80	0.89	<i>0.93</i>	0.86	

Note(s): The values on the diagonal in italicised type indicate the square root of the AVE value
M = Mean; SD = Standard deviation
Source(s): Authors' own creation

Table 3.
Results of discriminant validity test

Hypotheses testing

The model fit indices for the structural model provided empirical support for a well-fitted model ($\chi^2/df = 3.01$, RMR = 0.05, GFI = 0.96, NFI = 0.96, TLI = 0.97, CFI = 0.98, RMSEA = 0.07). The results derived from SEM largely validate the postulated hypotheses. [Hypothesis 1a](#), positing a positive link between *fMCI* and satisfaction, was supported ($\beta = 0.14$, $t = 2.50$, $p < 0.05$). Likewise, [Hypotheses 1b](#), [1c](#), [1d](#), which hypothesised associations between *hMCI* and satisfaction ($\beta = 0.37$, $t = 6.14$, $p < 0.001$), *cMCI* and satisfaction ($\beta = 0.20$, $t = 4.10$, $p < 0.001$), and *sMCI* and satisfaction ($\beta = 0.26$, $t = 5.12$, $p < 0.001$), were also substantiated. This study hypothesised that the four dimensions of MCI would positively relate to WOM intentions ([Hypotheses 2a to 2d](#)). Findings showed that *fMCI* ($\beta = 0.11$, $t = 2.30$, $p < 0.05$), *hMCI* ($\beta = 0.32$, $t = 6.11$, $p < 0.001$) and *cMCI* ($\beta = 0.16$, $t = 2.87$, $p < 0.01$) had a positive impact on WOM intentions, but the postulated link between *sMCI* and WOM was not substantiated ($\beta = 0.09$, $t = 1.86$). Finally, this study examined the partial mediation of satisfaction. Results showed that satisfaction partially mediates the relationships between *fMCI* ($\beta = 0.09$, $p < 0.05$, CI: 0.01 – 0.16), *hMCI* ($\beta = 0.20$, $p < 0.001$, CI: 0.12 – 0.31), and *cMCI* ($\beta = 0.11$, $p < 0.01$, CI: 0.03 – 0.19) and WOM intention, supporting [Hypotheses 4a to 4c](#). However, for the *sMCI*-WOM intention link, satisfaction fully mediates, indicating that *sMCI* influences WOM intention solely through satisfaction ($\beta = 0.14$, $p < 0.01$, CI: 0.07 – 0.22). The current research also controlled game satisfaction as a covariate in the analysis that may influence the dependent variable to avoid the effect of a positive experience with the game (see [Table 4](#)).

Discussion

Theoretical implications

The findings of this study verified and expanded the existing literature by empirically confirming that three dimensions of motivated innovativeness, namely *fMCI*, *hMCI* and *cMCI*, along with satisfaction, serve as precursors to WOM intention. Given that this research is the first attempt to test the hypothetical relationships, the results make a significant theoretical contribution to the existing knowledge for several reasons. First, by analysing the hypothetical relationships through post-experience evaluations, the present research enhances the theoretical understanding of sport fans' AR experiences, shedding light on

Hypothesised paths	Direct effects		Indirect effects	
	β	<i>t</i> -value	β	95% CI (lower – upper bounds)
H1a: <i>fMCI</i> → Satis	0.14	2.50*		
H1b: <i>hMCI</i> → Satis	0.37	6.14***		
H1c: <i>cMCI</i> → Satis	0.20	4.10***		
H1d: <i>sMCI</i> → Satis	0.26	5.12***		
H2a: <i>fMCI</i> → WOM	0.11	2.30*		
H2b: <i>hMCI</i> → WOM	0.32	6.11***		
H2c: <i>cMCI</i> → WOM	0.16	2.87**		
H2d: <i>sMCI</i> → WOM	0.09	1.86		
H3: Satis → WOM	0.53	10.04***		
H4a: <i>fMCI</i> → Satis → WOM			0.09*	0.01–0.16
H4b: <i>hMCI</i> → Satis → WOM			0.20***	0.12–0.31
H4c: <i>cMCI</i> → Satis → WOM			0.11**	0.03–0.19
H4d: <i>sMCI</i> → Satis → WOM			0.13**	0.07–0.22
<i>Endogenous variables</i>				
Satisfaction			0.80	R^2
Words-of-mouth intention			0.75	
<i>Control variable</i>				
Game satisfaction	–0.05	–1.66		
Note(s): β = Standardized regression weights; CI = confidence intervals				
χ^2/df = 3.01, RMR = 0.05, GFI = 0.96, NFI = 0.96, TLI = 0.97, CFI = 0.98, RMSEA = 0.07				
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed significance for standardised indirect effects)				
Source(s): Authors' own creation				

Table 4.
Results of hypotheses
testing

previously unexplored structural dynamics. Notably, post-experience motivation has been shown to be a more robust predictor of satisfaction compared to pre-experience motivation (Albayrak and Caber, 2018), underscoring the importance of our research approach.

Second, uncovering the role of satisfaction between MCI and WOM intention is another important theoretical contribution. Satisfaction was found to exert partial mediating effects on three of these paths (*fMCI* – WOM, *hMCI* – WOM and *cMCI* – WOM) and a full mediating effect on the association between *sMCI* and WOM. Fans' willingness to recommend or discuss the innovative experience with others seems to be anchored more firmly in the satisfaction they derive from the experience itself. Thus, the present study provides new pathways and expanded understanding in the formation of sport fans' AR experience WOM intention.

Third, the insignificant relationship between *sMCI* and WOM intention and the full mediating effect of satisfaction on the link offers intriguing theoretical insights in understanding consumer behaviour regarding using an AR live streaming service. Interestingly, this counterintuitive result is consistent with previous results (e.g. Hwang et al., 2019; Hwang et al., 2020), which also found that *sMCI* is not associated with behaviour intention and positive image of innovative products and services. This study strengthens this perspective, suggesting that satisfaction serves as a critical bridge between social motivations and outward sport fans behaviours like WOM. However, it is important to note that these results do not definitively rule out the possibility of a relationship, but rather suggest that it may not be as strong or direct as hypothesised.

The result also can be framed within the expectancy confirmation theory, which suggests that satisfaction arises when consumers' expectations are confirmed through their experiences, focusing on post-consumption expectation factors (Bhattacharjee, 2001). In our context, satisfaction emerges as a vital element, translating *sMCI* into WOM only when the AR live streaming experience aligns with the sport fans' expectations, while

acknowledging that sport consumption is to a large extent social consumption, whose potential influence on *sMCI* exceeds the purpose of our study. As such, we can attribute the above finding to the fact that socially innovative sport fans could be more cautious about their social image and identification (Bartels and Reinders, 2011). It can be inferred that if the AR experience is satisfactory and perceived to align with the image they wish to project, they are more likely to share their experiences. Conversely, if there is a dissonance between the experience and how they believe it will influence their social image, they may refrain from engaging in WOM. Thus, the key theoretical implication from the findings is that of the importance of ensuring AR experiences meet and exceed the expectations of socially motivated individuals, as their propensity to recommend is deeply intertwined with their level of satisfaction.

Implications for practitioners

The findings from this study offer useful insights for managers on the value of AR and its potential applications in sport, concerning both individuals employed in sports teams and technology companies. Given that satisfaction emerged as a pivotal factor in the formation of WOM intention, particularly when it comes to innovative products in the realm of AR sport live-streaming, it becomes imperative for marketers to ensure that AR experiences in sports streaming are user-friendly, immersive and aligned with consumer expectations. For instance, brands and sports teams might consider integrating real-time stats overlays during live streams, allowing fans to access player performance data without switching screens.

In addition, enhancing the quality of the app experience is essential as it is closely linked with user satisfaction, which in turn influences app store ratings as a form of positive WOM. High app ratings that reflect the quality of app experience can improve app rankings and foster trust among potential users (Pal Kapoor and Vij, 2020). Therefore, not only technically proficient elements but also attention to user experience elements, such as frequent updates, improved connectivity, simplified account setup and robust app features are crucial for a satisfied user experience (Kumar *et al.*, 2024).

At the same time, considering the full mediating role of satisfaction between socially motivated fans innovativeness and WOM intention, integrating social features, such as enabling users to invite friends to a virtual lounge to watch the game together having a chat function, can add a communal feel to the AR experience, thus catering to socially motivated individuals to increase their satisfaction.

Secondly, our study's findings suggest that marketers should use customer segmentation tools based on motivated consumer innovativeness factors, in order to be able to better understand their potential audience and, thus, how to best approach them in developing a post-experience relationship with them. By employing customer segmentation tools that focus on these specific innovativeness factors, marketers can garner a more nuanced comprehension of their potential sport fans and their expectations when using AR technology. For instance, for fans driven by cognitive motivation, it is essential to emphasise the important role of AR and potential future development of AR in sport, aiming to stimulate their intellectual curiosity.

On the other hand, those driven by functional motivation would appreciate a focus on the efficiency and convenience of AR usage, overcoming potential physical barriers of travelling to an event in order to attend it. The need to acquire such in-depth understanding of the users emerges through this study and can allow marketers to correspondingly craft tailored marketing strategies that not only appeal to these consumers but also foster a sustained post-experience relationship with them as a promoter of the AR service. These insights could also be utilised by media organisations and policymakers that are also beginning to engage in such technology usage, informing their adoption of the technology and how they understand and communicate with their customers/users of AR service.

Limitations and directions for future research

Despite the originality of the present research, it has three main limitations. First, the current study focused on the AR experiences of sports fans, within a specific demographic or geographic area, which is South Korea. It would be beneficial for subsequent studies to explore the role of motivated consumer innovativeness in different cultural or geographical settings, similar or less similar to the context studied. This would provide a more holistic understanding of how varying contexts influence the observed relationships. Thus, future research can examine the research model in different countries and sports to expand its generalisability and explanation power. Second, while this study addressed concerns related to common method bias by conducting the Harman's single factor test, future research should consider collecting data at multiple time points to further mitigate these concerns (Podsakoff *et al.*, 2003). Third, as a cross-sectional exploratory study, this study was based on a limited sample (exceeding the target sample size), which was studied in one moment in time. As technology continues to develop and is being adopted rapidly by consumers, future studies could adopt a longitudinal approach which could involve a larger number of participants to better capture the developing consumer behavioural intentions as technologies such as AR are becoming more widely accepted and accessible to consumers within and beyond sport.

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AppendixMotivated
sport fans
innovativeness
in AR

Variable	Frequency (<i>n</i>)	Percentage (%)
<i>Gender</i>		
Male	129	53.1
Female	114	46.9
<i>Age</i>		
17–19 years	43	17.7
20–29 years	93	38.3
30–39 years	61	25.1
40–49 years	36	14.8
Over 50 years	10	4.1
<i>Education</i>		
Less than a high school diploma	27	11.1
Associate's degree	70	28.8
Bachelor's degree	128	52.7
Graduate degree	18	7.4
<i>Occupation</i>		
Full-time employees	116	47.7
Part-time employees	1	0.4
Retired	3	1.2
Self-employed	19	7.8
Student	79	32.5
Others	25	10.3

463**Table A1.**
The characteristics of
sample**Corresponding author**Sungkyung Kim can be contacted at: sungkyung.kim@stir.ac.uk

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