



# Sports Participants' Intentions to Use Digital Technology for Sports Participation: A Behavioral Reasoning Theory Perspective

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## Abstract

The use of digital technology in sport is an inevitable trend, but the behavioral decision-making process of sport participants using digital technology for sport participation is unclear. This study used behavioral reasoning theory to develop and validate a theoretical model that analyses participants' behavioral cognitive decision-making by considering both reasons for adoption and against adoption and in doing so, explains sport participants' behavioral decision-making in using digital technology for sport participation, which is a theoretical extension of existing innovation frameworks in sport management and marketing. The study found that respondents' reasons against adoption the use of digital technology for sport participation had a greater influence on their attitudes and behavioral intentions, with perceived hedonism and barriers to use being the dominant factors in the reason for adoption and against adoption, respectively, and participants' values significantly influencing the reasons for adoption and against adoption the use of digital technology for sport participation. This study provides unique insights for developers and related marketing promoters of digital technology applications in sport, and in expanding the impacts associated with the use of digital technology in sport, it is necessary to clarify the reasons for adoption and against adoption, and to consider the values of the participants, so that the combination of digital technology and sport can better meet the actual needs of the participants.

Key words: digital technology, sports participation, behavioral intentions, BRT

## Introduction

Digitization has revolutionized the engagement of billions in sports activities (Westmattmann et al., 2021), offering tools for detailed training progress tracking (Campbell et al., 2008) and enhancing overall health levels (Higgins, 2016). Smart devices have been pivotal in encouraging preventative health behaviors

(Canhoto & Arp, 2017). In the post-pandemic era, the integration of advanced digital technologies like ICT, the internet, cloud computing, big data, and AI is increasingly seen as a solution to economic growth challenges (Jin et al., 2023). The realm of sports has seen a widespread adoption of digital technology, with innovations ranging from blockchain (Yadav et al., 2023) and AI in sports (Keiper et al., 2023), to virtual reality applications (Seong & Hong, 2022) and digital sports venues (Yang & Cole, 2022). The use of digital technology extends to sports training (Tjønndal, 2022),

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esports (Hallmann & Giel, 2018), fitness (Lupton, 2020), and interactive platforms (Uhrich, 2022). These studies have demonstrated the micro-level impacts resulting from the integration of “checking individual digital elements” with sports (Thompson et al., 2024). However, there remains a gap in understanding the decision-making processes of sports participants using digital technology for sports engagement, as human behavior is complex and multifaceted (Box-Steffensmeier et al., 2022). Thus, it is necessary to clarify the perspectives of sports participants on adopting digital technology for sports engagement. This understanding can quickly meet the specific needs of sports participants in an increasingly changing environment and is crucial for companies and organizations developing and marketing new products and services (Claudy et al., 2015).

Numerous social science researchers have developed theories to study human behavior, notably the Theory of Reasoned Action (TRA) by Fishbein & Ajzen (1975) and the Theory of Planned Behavior (TPB) by Ajzen (1991). These theories have been instrumental in understanding consumer decision-making across various domains, such as attitudes towards organic food purchases (Kumar et al., 2023), travel intentions (Nguyen et al., 2023), and perceptions of augmented reality in sports (Goebert & Greenhalgh, 2020). To enhance the understanding of human behavioral decisions, Westaby (2005) introduced the Behavioral Reasoning Theory (BRT), which considers both the reasons for adopting and reasons against adopting innovations in practical scenarios (Dhir et al., 2021). This dual consideration is crucial as it not only addresses conceptual distinctions but also leads to varied behavior (Gupta & Arora, 2017b). BRT has been applied in analyzing decision-making in diverse fields, including shared automobile use (Peterson & Simkins, 2019), online subscription beauty boxes (Sivathanu, 2018b), wearable devices (Sivathanu, 2018a), M-learning applications (Pillai & Sivathanu, 2018), and M-banking adoption (Gupta & Arora, 2017a). Although

the application of BRT in research is still emerging and thus under-researched (Sahu et al., 2020), findings by Claudy et al. (2015) suggest that BRT-based models can more effectively explain dependent variable variances compared to other behavioral theories.

In the domain of sports consumer behavior decision-making, Uhrich (2022) identified a gap in existing literature. Prior studies, such as those by Ha et al. (2015) and Kim et al. (2017), primarily focused on factors facilitating the adoption of new technologies in sports, but largely neglected the aspects of innovation resistance. Addressing this oversight, Uhrich employed the Behavioral Reasoning Theory (BRT) to amalgamate factors both pro-adoption and anti-adoption of technology, particularly in the context of fan experience applications. While the advancement of digital technology has been positively transforming lifestyles and behaviors globally (Luo & He, 2021), However, no research has yet utilized behavioral reasoning theory to analyze sports participants' views on using digital technology for sports engagement and its impact on their behavioral decisions. It is necessary to consider both the factors of reasons for adoption and against adoption to analyze the sports participants' perspectives on using digital technology and its influence on their behavioral decisions, thereby supplementing the existing knowledge.

This study employs the Behavioral Reasoning Theory to develop and empirically validate a theoretical model. The model aims to decipher the decision-making process of sports participants when using digital technology for sports involvement. A key objective is to understand the relationship between the reasons for using digital technology in sports, and how these reasons influence participants' attitudes and behavioral intentions. Additionally, the study seeks to determine which factors within these reasons exert the most significant impact. Such insights are invaluable for developers and marketers, enabling them to devise strategies that enhance the experience and satisfaction of sports participants engaged with digital technology.

This research is structured into six primary sections: the introduction (current section), a literature review, research methods, results, conclusions, and finally, a discussion on the study's limitations and future research prospects.

## Theoretical Background

### Digital Technology and Sports

Digital Technology, leveraging information communication, data analysis, and other advanced technologies, facilitates the interaction between data, computational, and physical systems. Recognized as an emerging modern technology (Popkova et al., 2022), it encompasses fields like artificial intelligence, big data, the Internet of Things, and blockchain. Beyond being a potential catalyst for future economic growth (Jin et al., 2023), its application in sports is increasingly evident. Numerous studies have explored the integration of digital technology in various aspects of sports, such as sports social media (Yadav et al., 2023), sports training (Tjønndal, 2022), sports education (Keiper et al., 2023), sports participation (Lupton, 2020; Seong & Hong, 2022), smart sports venues (Yang & Cole, 2022), and esports (Hallmann & Giel, 2018). Despite these advancements, there remains a gap in understanding the comprehensive perceptions of consumers and the decision-making processes involved in adopting digital technology within sports participation.

### Behavioral Reasoning Theory

BRT, introduced by Westaby in 2005, represents a significant evolution in marketing and behavioral theory, advancing beyond traditional models like the TRA and the TPB. Ryan & Casidy (2018) highlight its distinct advantages over other behavioral theories. Primarily, BRT incorporates a dual-structure, two opposing motivations include: for and against adoption reasons. This approach captures opposing motivations,

offering a comprehensive perspective on how these factors jointly influence user intentions and behaviors. By considering both positive and negative aspects, BRT provides a more nuanced understanding of human decision-making. Additionally, BRT places significant emphasis on the role of values and beliefs in shaping reasons and intentions, as noted by Sahu et al. (2020). This aspect underscores the theory's depth in predicting behavioral outcomes. Moreover, Claudy et al. (2015) found that the BRT model more effectively explains dependent variables than other behavioral theories.

The different structures in the BRT model (Westaby, 2005) are defined as follows: Beliefs (values) are defined as a person's cognitive decisions or subjective judgments; Reasons are the rationale influencing the occurrence of behavior, including both supportive and opposing reasons; Global motives relates to three sub-structures: Attitude (ATT), Subjective Norms (SN), and Perceived Behavioral Control (PBC). ATT represents the global choice of performing a behavior, formed through an individual's analysis and evaluation to create a behavioral tendency; SN refers to the perceived social pressure before performing a behavior; PBC is the perceived ease or difficulty of carrying out a specific behavior; Intentions to use (IU) are the intent or adoption intention of individuals to try and strive to perform that behavior.

### Attitudes and Global Motives

Behavioral Reasoning Theory, as posited by Westaby(2005), identifies attitude as a crucial factor in shaping consumers' adoption intentions. Westaby classifies attitude, along with subjective norms and perceived behavioral control, under the umbrella of global Motives. These elements are key in predicting behavioral intentions across various contexts. In consumer behavior research, Ajzen (2001) has underscored attitude as a pivotal predictor of adoption decisions. Empirical studies further reinforce this notion. Wisner (2007) demonstrated that including

attitude factors notably improved the prediction accuracy of American households' adoption intention to adopt green energy. Similarly, Songkram et al. (2023) observed in their study on digital learning platforms adoption among students that attitude was the most significant determinant of behavioral intentions. Stockless (2018) also reported a substantial impact of attitude on intentions in their research on learning management system acceptance. Given this consistent emphasis on attitude as a key predictor, this study adopts attitude as the primary indicator of global motives.

## Values and Reasons

Individual values significantly influence specific consumer behaviors, like the adoption of new products, as demonstrated by Kamakura & Mazzon (1991). Rooted in Rokeach's (1973) foundational research, Schwartz (1992) further developed this concept by identifying ten unique values. These values are grouped into four higher-order domains, forming two bipolar dimensions: Openness to change versus conservation, and Self-Transcendence versus Self-Enhancement. The 'Openness to Change (OTC)' value, in particular, encourages individuals to embrace novel experiences and uncertainties (Schwartz, 1992). It is characterized by open-mindedness, creativity, an intention to adopt new things, and a propensity for risk-taking. This value encompasses aspects like stimulation, hedonism, and self-direction (Tewari et al., 2023). Given that the integration of digital technology in sports represents a form of innovation, it is pertinent to explore whether and how this 'new thing' aligns with individual consumer values. Hence, this study adopts 'Openness to Change (OTC)' as a key measure of values to understand the acceptance of digital technology in sports.

Values are a pivotal component in influencing both the acceptance and rejection of new technologies, as well as shaping attitudes, as highlighted by Ashfaq et al. (2021). They are also fundamental to the Behavioral

Reasoning Theory (BRT), according to Dhir et al. (2021). Individuals who exhibit a high degree of Openness to Change (OTC) are often more intrigued by new products or services, leading them to explore such innovations (Gupta & Arora, 2017a). For instance, in a study involving 815 respondents on wearable technology in healthcare, Sivathanu (2018a) demonstrated that the values of Openness to Change (OTC) have a positive effect on reasons for acceptance and a negative effect on reasons against adoption. In the context of digital technology application in sports, the influence of participants' values on their acceptance and rejection of such technology remains an area to be explored. To address this, the current study proposes two hypotheses:

H1a: The values of sports participants will have a positive impact on their reasons for adoption the use of digital technology in sports participation.

H1b: The values of sports participants will have a negative impact on their reasons against adoption the use of digital technology in sports participation.

## Values and Attitudes

Values can exert a direct influence on attitudes, bypassing the mediation of reasons, as suggested by Sivathanu (2018b). This aligns with Westaby's (2005) observation that behavior involves diverse, unique, systematic, and complex psychological processes. Consequently, reasoning is not isolated from an individual's beliefs and values (Claudy et al., 2013). This link between values and attitudes is a recognized principle in marketing research (Gupta & Arora, 2017a; Sivathanu, 2018a), indicating a strong correlation between the two. Research by Claudy et al. (2013) supports this, indicating that when a product or service aligns with a consumer's personal values, it typically leads to more favorable perceptions of that product or service. Given this understanding, it is hypothesized in the context of this study that participants' values may significantly shape their attitudes towards the use of

digital technology in sports participation. Thus, the following hypothesis is proposed:

H2: The values of sports participants will have a positive impact on their attitudes towards using digital technology in sports participation.

## Reasons and Attitudes and Adoption Intentions

### Reasons for Adoption

In previous research, scholars have argued that perceived usefulness and perceived ease of use together determine attitudes or directly predict behavioral intentions (Davis, 1989). As research has progressed, some scholars have also found that perceived usefulness and perceived ease of use do not fully explain consumers' behavioral intentions to embrace innovations (Bruner & Kumar, 2005; Jin, 2014; Liao & Tsou, 2009). This is because technology use is influenced by extrinsic motivation (i.e., usefulness) and intrinsic motivation (i.e., enjoyment) (Zhou & Feng, 2017). Furthermore, perceived usefulness, perceived ease of use, and enjoyment are representative of utilitarian motivations, effort expectancy, and hedonic motivations associated with technology use, respectively (Huang & Ren, 2020). In light of these insights, this study will incorporate perceived ease of use, perceived usefulness, and perceived enjoyment as the key reasons for adoption digital technology in sports participation.

Rauniar et al. (2014) assert that perceived ease of use and usefulness are significant in explaining an individual's behavior in adopting new technology. Perceived ease of use refers to the degree to which consumers believe that a particular information technology or system is simple to use and does not require substantial mental or physical effort. Perceived usefulness refers to the extent to which people believe that a particular technology or system helps or enhances their work or daily life (Davis, 1989). These factors have been consistently identified as crucial predictors

of positive attitudes in various studies, including the use of Taekwondo scoring technology (Ko et al., 2011), the adoption of E-learning systems by college students (Amin et al., 2017), and the utilization of learning management systems by teachers (Alharbi & Drew, 2014). Additionally, perceived enjoyment, a form of hedonic motivation, is defined as an intrinsic motivation reflecting the pleasure and joy derived from using the system, plays a pivotal role in influencing customer satisfaction and ongoing usage intentions (Akdim et al., 2022). Studies by Hew et al. (2018) and Akdim et al. (2022) found that enjoyable user experiences lead to continued use of mobile applications. However, the research exploring the perceived benefits of digital technology in the context of sports consumers is still limited. Therefore, the impact of these elements on the decision-making process of sports participants utilizing digital technology remains to be fully understood. Consequently, this study proposes the following hypotheses:

H3a: The reasons for adoption the use of digital technology will have a positive impact on sports participants' attitudes towards using digital technology in sports participation.

H4a: The reasons for adoption the use of digital technology will have a positive impact on sports participants' adoption intentions to use digital technology in sports participation.

### Reasons Against Adoption

While the Diffusion of Innovations model primarily focuses on adoption factors, it pays less attention to resistance, which Chen & Kuo (2017) note as a significant limitation in the acceptance of innovations. To address this, the Theory of Innovation Resistance, developed by Ram & Sheth (1989), delves into factors that hinder innovation adoption. They identify functional and psychological barriers as key impediments, further dividing these into usage, value, risk, tradition, and image barriers. Empirical evidence

supports the impact of these barriers on innovation promotion. The experience of usage barriers stems from the notion that innovation requires changing consumers' valuable consumption habits, which are the result of long-term use of the same product (Sheth, 1981). The development of electric vehicles (EVs) will be limited due to usage barriers (Zhang et al., 2011); Value barriers guide consumers to recognize that the value created by innovative products is higher than that created by existing products (Chen & Kuo, 2017). Laukkanen (2016) found that value barriers are the strongest inhibitory factor on the willingness to innovate and use mobile and internet banking services; The degree of uncertainty and unpredictability associated with innovation is referred to as risk barriers (Sheth, 1981). Risk barriers may make users of online travel agencies feel unsafe, thereby inhibiting their willingness to use online travel agencies Talwar et al. (2020); Traditional barriers occur when innovation forces consumers to accept cultural changes and deviate from established traditions, leading to resistance (Sheth, 1981). Traditional barriers are the reasons why consumers resist mobile commerce applications (Hew et al., 2023); Laukkanen et al. (2009) define image barriers as "obstacles stemming from stereotypes that hinder the adoption of innovations." Negative image cognition ultimately leads to resistance to innovation (Kleijnen et al., 2009). These findings across different contexts reinforce the relevance of these barriers to innovation resistance. Consequently, this study will consider usage, value, risk, tradition, and image barriers as reasons for resisting the use of digital technology in sports participation. We aim to understand the impact of these barriers on attitudes and adoption Intentions to adopt digital technology. Accordingly, the following hypotheses are posited:

H3b: The reasons against adoption digital technology will have a negative impact on sports participants' attitudes towards using digital technology in sports participation.

H4b: The reasons adoption digital technology will

have a negative impact on the adoption intentions of sports participants' to use digital technology in sports participation.

## Attitudes and Adoption Intentions

Eagly and Chaiken (1993) describe attitude as a psychological tendency that is expressed by evaluating a specific entity favorably or unfavorably. While consumer intention is recognized as distinct from attitude (Honkanen et al., 2006), positive attitudes towards innovation are often linked to a higher likelihood of adoption (Bagozzi, 1992). The acceptance of technology or innovation by consumers is critical, as technology derives its value from being accepted and used (Oye et al., 2014). Historically, literature has established that attitude positively affects behavioral intention (Davis, 1989; Fishbein & Ajzen, 1975; Westaby, 2005). This correlation is further confirmed in recent studies in various fields, including the adoption of mobile banking (Gupta & Arora, 2017a), mobile shopping (Gupta & Arora, 2017b), and broader innovation adoption (Claudy et al., 2015). In marketing, attitude is particularly recognized as a key determinant of consumer purchasing decisions, thereby serving as a strong predictor of consumer intention and behavior (Casidy et al., 2017; Dilmeri et al., 2017). The influence of consumer attitudes on the intention to use corresponding technologies has been observed in multiple domains, such as mobile technology (McLean & Osei-Frimpong, 2019), green consumption (Verma et al., 2019), smart chatbots (Kasilingam, 2020), AI customer service (Jan et al., 2023), AI voice assistants (Anayat et al., 2023), and autonomous vehicles (Kottasz et al., 2021). Despite extensive discussion in literature on the application and potential of digital technology, studies utilizing Behavioral Reasoning Theory to analyze consumer decision-making processes in this context are limited. Given that the integration of digital technology in sports represents an innovation, understanding the attitudes and intentions of sports

participants towards using such technology is crucial. Therefore, the study proposes the following hypothesis:

H5: The attitudes of sports participants towards using digital technology in sports participation will have a positive impact on their intentions to use digital technology in sports participation.

## Values and Adoption Intentions

Openness to Change (OTC) is a value that drives individuals towards intellectual and emotional pursuits in uncertain and unpredictable directions (Schwartz, 1992). Characterized by traits such as open-mindedness, creativity, adoption intention to experiment, and risk-taking (Kruse et al., 2018), OTC encompasses stimulation, hedonism, and self-direction (Schwartz, 2003). Individuals who highly value OTC often enjoy being early adopters of innovative solutions. Previous studies have shown that consumers who are proactive in health care and inclined to purchase green food products are influenced by this value in their attitude towards green products (Nguyen et al., 2019). In essence, OTC affects consumers' readiness to embrace unconventional and novel products (Tewari et al., 2022). Given that the integration of digital technology in sports represents a new frontier, it raises the question of whether participants' preference for new experiences and innovations will lead them to more readily accept

and utilize digital technology in sports participation. Therefore, this study proposes the following hypothesis:

H6: The values of Openness to Change will have a positive impact on sports participants' adoption intentions to use digital technology in sports participation.

## Research Method

### Research Subjects

The survey focused on individuals in China who engage in sports activities using digital technology. We conducted random surveys during the Hangzhou Asian Games through various online social platforms, including WeChat, Weibo, Bilibili, Douyin, and others, by distributing online questionnaires. The Hangzhou Asian Games featured a wide array of digital technologies in the field of sports, such as digital twin technology, 3D modeling, intelligent robots, and intelligent monitoring systems. Leveraging the internet platform, which is a direct outcome of digital technology, proved to be an effective means of gathering data from our target population. The initial questionnaire aimed to gauge the frequency of sports participation involving digital technology, with respondents self-assessing their engagement on a scale from 0% to 100%. Respondents who reported not using digital technology for sports activities (0% frequency) were excluded, resulting in 417 eligible questionnaires. After filtering out questionnaires with incomplete or insincere responses (per Zhong et al., 2021), we obtained a total of 374 valid questionnaires, as summarized in Table 1. In terms of demographics, the majority of respondents were male (59.4%) compared to females (40.6%), and the most prevalent age group was 31-40 years, representing 31.6% of the total sample. Bachelor's degree holders comprised the largest educational background category at 47.9%. Additionally, a significant portion of the respondents (32.9%) reported an income of less than 2000 yuan,

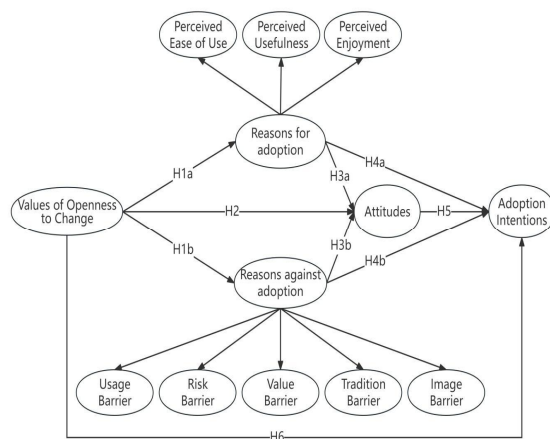


Figure 1. Research Model

**Table 1.** Sample characteristics

| Item             | Description                  | N    | Percentage |
|------------------|------------------------------|------|------------|
| Gender           | Male                         | 222  | 59.4%      |
|                  | Female                       | 152  | 40.6%      |
| Age              | under 18                     | 41   | 11.0%      |
|                  | 18-30 years old              | 107  | 28.6%      |
|                  | 31-40 years old              | 118  | 31.6%      |
|                  | 41-50 years old              | 69   | 18.4%      |
|                  | 51-60 years old              | 20   | 5.3%       |
|                  | Over 60 years old            | 19   | 5.1%       |
| Education        | Junior high school and below | 21   | 5.6%       |
|                  | High school                  | 54   | 14.4%      |
|                  | College                      | 100  | 26.7%      |
|                  | undergraduate                | 179  | 47.9%      |
| Occupation       | Graduate students and above  | 20   | 5.3%       |
|                  | Student                      | 93   | 24.9%      |
|                  | Teacher                      | 33   | 8.8%       |
|                  | Full-time housewife          | 39   | 10.4%      |
|                  | Company employees            | 112  | 29.9%      |
|                  | Freelance work               | 65   | 17.4%      |
| Income           | Other                        | 32   | 8.6%       |
|                  | 2000 Yuan and below          | 123  | 32.9%      |
|                  | 2001-4999 Yuan               | 83   | 22.2%      |
|                  | 5000-7999 Yuan               | 82   | 21.9%      |
|                  | 8000-9999 Yuan               | 42   | 11.2%      |
|                  | 10000-14999 Yuan             | 28   | 7.5%       |
| Frequency of use | 15000 Yuan and above         | 16   | 4.3%       |
|                  | 10%                          | 34   | 9.1%       |
|                  | 20%                          | 40   | 10.7%      |
|                  | 30%                          | 44   | 11.8%      |
|                  | 40%                          | 63   | 16.8%      |
|                  | 50%                          | 74   | 19.8%      |
|                  | 60%                          | 42   | 11.2%      |
|                  | 70%                          | 32   | 8.6%       |
|                  | 80%                          | 27   | 7.2%       |
|                  | 90%                          | 15   | 4.0%       |
| 100%             | 3                            | 0.8% |            |

with 19.8% indicating a 50% frequency in sports participation using digital technology. Further demographic details are presented in Table 1.

## Survey Procedure

To ensure the methodological soundness of our study, our surveyors identified individuals actively engaging in discussions, liking, or bookmarking content on various social media platforms (including WeChat,

Weibo, Bilibili, Douyin, etc.) during the Hangzhou Asian Games. These platforms featured short videos, news updates, or WeChat Moments related to the application of digital technology in sports, such as VR venue virtual reality experiences, smart sports, and personalized assessments. This ensured that our respondents were already exposed to content pertaining to the integration of digital technology in sports and were in a suitable state to participate in our survey. It's important to note that the content within these short videos, news updates, or WeChat Moments had to include discussions of digital technology's role in sports. Following this, our research team provided participants with comprehensive information about the survey's purpose, procedures, methods, expected time commitment, data confidentiality, and sought their informed consent to participate. This approach guaranteed ethical protection for our participants. To ensure the effectiveness of our survey, the initial section aimed to assess respondents' adoption intention to engage in sports-related activities, including physical exercise, watching sports events, or specific sports-related consumption. The questionnaire began with an introduction to the application of digital technology in sports, covering aspects like intelligent monitoring devices, VR viewing experiences, smart wearable devices, and big data analytics. This introductory section ensured that respondents had a clear understanding of how digital technology is applied in sports, enabling them to independently complete the survey. Initially, we collected 417 questionnaires, but after excluding those with incomplete or insincere responses (Zhong et al., 2021), we were left with a total of 374 valid questionnaires.

## Measurement Tools

In this study, we employed a questionnaire as our primary measurement tool, encompassing latent variables that included openness to change, reasons against adoption, reasons for adoption, attitudes, usage



intentions, along with questions regarding demographic characteristics. The values reflecting openness to change and usage barriers and image barriers were adapted from the work of Pillai & Sivathanu (2018). Risk barriers were integrated and applied in this study based on research by Gupta & Arora (2017a) and Sivathanu (2018b). Tradition barriers were adapted from sources such as Pillai & Sivathanu (2018), Sadiq et al. (2021), and Sivathanu (2018a). Perceived ease of use and usefulness were adapted from the study conducted by Alharbi & Drew (2014), while perceived enjoyment drew inspiration from Thong et al. (2006). Attitudes were adapted from Claudy et al. (2015) and Pillai & Sivathanu (2018), and usage intentions were derived from Fishbein & Ajzen (1975). Specific measurement items can be found in Table 2. The observational variables of this study were assessed using a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

## Data Analysis Method

In this study, data analysis was performed using SPSS 27 and Amos 24. Initially, we conducted descriptive statistical analysis, normality tests on the observational variables, and correlation analysis using SPSS to assess the data's suitability for subsequent statistical analysis. Following this, SPSS was utilized to assess data reliability, ensuring that the survey results met the necessary credibility criteria and demonstrated sufficient reliability and stability. Building on these preliminary steps, we proceeded with confirmatory factor analysis using Amos to evaluate both the convergent and discriminant validity of the data. This step aimed to establish a high level of internal consistency within the latent variables while also confirming sufficient differentiation between these variables, ensuring that the measurement results accurately reflected the nuanced characteristics of the corresponding variables. Lastly, we employed Amos to validate the structural model and hypotheses proposed in this study.

**Table 2.** Questionnaire constructs and variables

| Main construct               | Item  |
|------------------------------|---|
| Values of Openness to Change | VOC1 I'm always looking for new things to be surprised by.  |
|                              | VOC2 I'm an adventurous person who likes to experience new things   |
|                              | VOC3 I'm open to new experiences.   |
| Usage Barrier                | UB1 Using digital technology for sports participation is not easy   |
|                              | UB2 Using digital technology to participate in sports is not convenient                                     |
|                              | UB3 The use of digital technology for sports participation can be limited by the need for facilities        |
| Risk Barrier                 | RB1 Using digital technology for sports participation is unreliable   |
|                              | RB2 I am concerned that my information may be leaked when using digital technology for sports participation |
|                              | RB3 I think it's risky to use digital technology to participate in sport                                    |
| Value Barrier                | VB1 In my opinion, there is no advantage to using digital technology for sports participation               |
|                              | VB2 In my opinion, using digital technology to participate in sports would not improve my own abilities     |
|                              | VB3 No advantage to using digital technology for sports participation                                       |
| Tradition Barrier            | TB1 Traditional forms of sports participation are good enough for me.                                       |
|                              | TB2 I'm comfortable playing traditional sports.   |
|                              | TB3 I would be more satisfied using traditional forms of sports participation                               |
| Image Barrier                | IB1 I don't have a positive impression of the use of digital technology in physical activity                |
|                              | IB2 Sports participation through the use of digital technology is often difficult                           |
|                              | IB3 I think digital technology is complex   |

|                      |                       |  |   |
|----------------------|-----------------------|--|---|
| Reasons for adoption | Perceived Ease of Use | PEOU1  | I think it's easy to use digital technology to engage in physical activity                              |
|                      |                       | PEOU2  | It will be easy for me to learn and use digital technology for sports participation.                    |
|                      |                       | PEOU3  | I have found that using digital technology for sports participation allows for flexible and interactive |
|                      | Perceived Usefulness  | PU1  | Using digital technology for sports participation allows me to complete required tasks faster           |
|                      |                       | PU2  | Using digital technology for sports participation can improve my productivity                           |
|                      |                       | PU3  | Using digital technology can make sports participation easier   |
|                      | Perceived Enjoyment   | PE1  | Using digital technology to participate in sports is enjoyable  |
|                      |                       | PE2  | It's fun to use digital technology to participate in physical activity                                  |
|                      |                       | PE3  | I'm a big fan of using digital technology to participate in sports                                      |
| Attitudes            | ATT1                  | I think it's a good idea to utilize digital technology for physical activity     |   |
|                      | ATT2                  | I think digital technology can offer many benefits to sports participation       |   |
|                      | ATT3                  | I think using digital technology will add more value to my sports participation  |   |
| Adoption Intentions  | AI1                   | I will use digital technology to participate in sports                           |   |
|                      | AI2                   | I can see myself using digital technology for sports participation in the future |   |
|                      | AI3                   | I intend to use digital technology for sports participation                      |   |

### Validation of the Second-Order Factor Structure of Reasons for Adoption and Reasons Against Adoption

The study validated the second-order factor structures of 'Reason for adoption' and 'Reasons against adoption' separately. The reasons for adoption include three structures: perceived usefulness, perceived ease of use, and perceived enjoyment; the reasons against adoption consist of five structures: usage barriers, risk barriers, value barriers, tradition barriers, and image barriers. The analysis results are as follows: For 'Reason for adoption', the model fit indices for the second-order factor structure are:  $X^2 = 57.774$ ;  $DF = 24$ ;  $X^2/DF = 2.407$ ;  $GFI = .967$ ;  $TLI = .979$ ;  $NFI = .977$ ;  $CFI = .986$ ;  $RMSEA = .061$ ;  $SRMR = .0247$ . The factor loadings for the three factors are: perceived usefulness (.759), perceived ease of use (.750), perceived enjoyment (.678), with all three factors having factor loadings above 0.50. The factor loadings of the observed variables for these three factors are: perceived usefulness (.877~.900), perceived ease of use (.848~.886), perceived enjoyment (.835~.892). For 'Reasons against adoption', the model fit indices for the second-order factor structure are:  $X^2 = 166.626$ ;  $DF = 85$ ;  $X^2/DF = 1.960$ ;  $GFI = .944$ ;  $TLI = .977$ ;  $NFI = .963$ ;  $CFI = .981$ ;  $RMSEA = .051$ ;  $SRMR = .0336$ . The

factor loadings for the five factors are: usage barriers (.815), risk barriers (.744), value barriers (.797), tradition barriers (.781), image barriers (.731). The factor loadings of the observed variables for these five factors are: usage barriers (.852~.893), risk barriers (.844~.903), value barriers (.850~.874), tradition barriers (.841~.872), image barriers (.863~.900). From the above analysis results, it is clear that both second-order factor models have good fit indices, and the factor loadings are all above 0.5, meeting the standards proposed by Hu and Bentler (1999). It can be concluded that the factors influencing acceptance and rejection reasons demonstrate a stable second-order factor structure. Subsequently, a Confirmatory Factor Analysis (CFA) was conducted based on these second-order factors.

### Confirmatory Factor Analysis of All Constructs

Firstly, the validity of the measurement model was tested using SPSS, yielding a KMO value of 0.878, and Bartlett's test of sphericity was significant ( $P < 0.05$ ). Reliability analysis indicated that the minimum Cronbach's Alpha coefficient was 0.888, meeting the general standard of 0.7 for internal consistency (Bagozzi & Yi, 1988), as detailed in Table 3. This suggests that

the data is suitable for confirmatory factor analysis. Subsequently, confirmatory factor analysis of the measurement model was conducted using Amos 24. The results indicated a good overall fit of the model ( $X^2=826.894$ ;  $DF=477$ ;  $X^2/DF=1.734$ ;  $GFI=0.883$ ;  $TLI=0.969$ ;  $NFI=0.919$ ;  $CFI=0.964$ ;  $RMSEA=0.044$ ;  $SRMR=0.0543$ ). As shown in Table 3, all standardized factor loadings were statistically significant ( $p<.001$ ) and exceeded the value of 0.50, aligning with the criteria set by Nunnally and Bernstein (1994) that latent

variables' standardized factor loadings greater than 0.5 are considered to have convergent feasibility. To further verify the validity of the measurement tool, it is necessary to confirm the specific values of Composite Reliability (CR) and Average Variance Extracted (AVE).

To confirm that the measurement tool has good convergent and discriminant validity, the results of the validity analysis are presented in Table 4. Hair et al. (2014) suggest that if the AVE is greater than 0.5 and

**Table 3.** Confirmatory factor analysis results

| Main construct               | Item                  | M    | SD   | First-order Loading | Second-order Loading | Cronbach's Alpha |      |
|------------------------------|-----------------------|------|------|---------------------|----------------------|------------------|------|
| Values of Openness to Change | VOC1                  | 4.79 | 1.87 | .874                |                      | .901             |      |
|                              | VOC2                  | 4.85 | 1.91 | .859***             |                      |                  |      |
|                              | VOC3                  | 4.84 | 1.86 | .869***             |                      |                  |      |
| Usage Barrier                | UB1                   | 3.95 | 1.95 | .895                | .861***              | .903             |      |
|                              | UB2                   | 4.01 | 1.99 | .853***             |                      |                  |      |
|                              | UB3                   | 4.01 | 1.97 | .864***             |                      |                  |      |
| Risk Barrier                 | RB1                   | 3.8  | 1.91 | .843                | .721***              | .902             |      |
|                              | RB2                   | 4.04 | 1.94 | .904***             |                      |                  |      |
|                              | RB3                   | 3.87 | 1.96 | .858***             |                      |                  |      |
| Reasons against adoption     | Value Barrier         |      |      |                     | .707***              | .897             |      |
|                              | VB1                   | 4.16 | 1.94 | .866                |                      |                  |      |
|                              | VB2                   | 4.17 | 2.00 | .874***             |                      |                  |      |
| Tradition Barrier            | TB1                   | 4.08 | 2.00 | .841                | .759***              | .888             |      |
|                              | TB2                   | 4.25 | 2.01 | .846***             |                      |                  |      |
|                              | TB3                   | 4.18 | 2.04 | .870***             |                      |                  |      |
| Image Barrier                | IB1                   | 4.12 | 1.96 | .897                | .739***              | .917             |      |
|                              | IB2                   | 4.3  | 2.00 | .901***             |                      |                  |      |
|                              | IB3                   | 4.3  | 2.02 | .862***             |                      |                  |      |
| Reasons for adoption         | Perceived Ease of Use |      |      |                     | .714***              | .905             |      |
|                              | PEOU1                 | 4.83 | 1.77 | .879                |                      |                  |      |
|                              | PEOU2                 | 4.66 | 1.89 | .897***             |                      |                  |      |
|                              | Perceived Usefulness  | PU1  | 5    | 1.82                | .867                 | .700***          | .901 |
|                              |                       | PU2  | 4.97 | 1.87                | .849***              |                  |      |
|                              |                       | PU3  | 5.04 | 1.86                | .886***              |                  |      |
|                              | Perceived Enjoyment   | PE1  | 4.73 | 1.85                | .892                 | .762***          | .914 |
|                              |                       | PE2  | 4.74 | 1.87                | .891***              |                  |      |
|                              |                       | PE3  | 4.71 | 1.86                | .834***              |                  |      |
| Attitudes                    | ATT1                  | 4.41 | 2.04 | .878                |                      | .919             |      |
|                              | ATT2                  | 4.51 | 2.06 | .873***             |                      |                  |      |
|                              | ATT3                  | 4.4  | 2.03 | .921***             |                      |                  |      |
| Adoption Intentions          | AI1                   | 4.71 | 1.22 | .909                |                      | .918             |      |
|                              | AI2                   | 4.74 | 1.21 | .894***             |                      |                  |      |
|                              | AI3                   | 4.77 | 1.24 | .862***             |                      |                  |      |

\*  $p<.05$ ; \*\*  $p<.010$ ; \*\*\*  $p<.001$

**Table 4.** Validity analysis results

|      | CR    | AVE   | VOC          | UB           | RB           | VB           | TB           | IB           | PE           | PU           | PEOU         | ATT          | AI           |
|------|-------|-------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| VOC  | 0.901 | 0.752 | <i>0.867</i> |              |              |              |              |              |              |              |              |              |              |
| UB   | 0.904 | 0.758 | -0.281       | <i>0.870</i> |              |              |              |              |              |              |              |              |              |
| RB   | 0.902 | 0.755 | -0.154       | 0.591        | <i>0.869</i> |              |              |              |              |              |              |              |              |
| VB   | 0.898 | 0.745 | -0.095       | 0.625        | 0.598        | <i>0.863</i> |              |              |              |              |              |              |              |
| TB   | 0.889 | 0.727 | -0.134       | 0.615        | 0.649        | 0.627        | <i>0.853</i> |              |              |              |              |              |              |
| IB   | 0.917 | 0.787 | -0.151       | 0.664        | 0.477        | 0.605        | 0.524        | <i>0.887</i> |              |              |              |              |              |
| PE   | 0.913 | 0.779 | 0.257        | -0.322       | -0.157       | -0.132       | -0.195       | -0.114       | <i>0.872</i> |              |              |              |              |
| PU   | 0.901 | 0.753 | 0.087        | -0.17        | -0.099       | -0.085       | -0.123       | -0.079       | 0.509        | <i>0.867</i> |              |              |              |
| PEOU | 0.906 | 0.762 | 0.067        | -0.162       | -0.057       | -0.093       | -0.095       | -0.075       | 0.514        | 0.569        | <i>0.882</i> |              |              |
| ATT  | 0.92  | 0.794 | 0.4          | -0.567       | -0.298       | -0.29        | -0.344       | -0.381       | 0.398        | 0.103        | 0.169        | <i>0.891</i> |              |
| AI   | 0.918 | 0.79  | 0.464        | -0.503       | -0.249       | -0.284       | -0.248       | -0.354       | 0.376        | 0.122        | 0.149        | 0.534        | <i>0.889</i> |

Notes. The diagonal shows the square root of the AVE in italics

the CR is greater than 0.7, then the convergent validity is considered acceptable. Additionally, if the square root of each measurement construct's AVE is greater than the estimated correlations between other measurement constructs (Fornell & Larcker, 1981), the measurement model is deemed to have satisfactory discriminant validity.

## Research Results

This study employed Amos 24 to validate the hypotheses of the structural equation model. The fit of the model, as shown in Table 5, met the standard criteria, and the test results indicated significant impacts on all paths. Specifically, it was found that the respondents' values orientation towards openness to change positively affected their reasons for adoption digital technology in sports participation ( $\beta=.199$ ,  $p<.010$ ) and negatively influenced their reasons against adoption digital technology in sports participation ( $\beta=-.229$ ,  $p<.001$ ), thus supporting hypotheses H1a and H1b. The respondents' openness to change positively impacted their attitudes towards using digital technology in sports participation ( $\beta=.275$ ,  $p<.001$ ), confirming hypothesis H2. The reasons for adoption digital technology in sports participation positively influenced the attitude towards using digital technology in sports ( $\beta=.173$ ,  $p<.010$ ), while the reasons against adoption digital technology negatively influenced this attitudes

( $\beta=-.418$ ,  $p<.001$ ), thereby supporting hypotheses H3a and H3b. Additionally, the reasons for adoption digital technology in sports participation positively affected the adoption intentions to use digital technology in sports ( $\beta=.113$ ,  $p<.05$ ), and the reasons against adoption it had a negative effect on this adoption intentions ( $\beta=-.220$ ,  $p<.001$ ), supporting hypotheses H4a and H4b. Furthermore, the respondents' attitudes towards using digital technology in sports positively influenced their adoption intentions to engage in it ( $\beta=.275$ ,  $p<.001$ ), supporting H5. Finally, the respondents' values orientation towards openness to change had a positive impact on their adoption intentions to use digital technology in sports participation ( $\beta=.285$ ,  $p<.001$ ), thereby supporting hypothesis H6.

The analysis further indicates that all second-order path coefficients are statistically significant (see Table 5 for details). Therefore, all specific reasons (for and against adoption) are significantly correlated with their respective abstract concepts (i.e., higher-order reasons for and against adoption). Specifically, perceived enjoyment is evidently the strongest reason for adopting digital technology in sports participation ( $\beta=.744$ ), while perceived ease of use ( $\beta=.728$ ) and perceived usefulness ( $\beta=.71$ ) almost similarly reflect reasons for adoption digital technology. Among the reasons against adoption, usability barriers ( $\beta=.856$ ) are the most relevant restraining factors and a significant element influencing sports participants' refusal to use digital technology in

**Table 5.** Structural model results

| First-order paths  |                          |       |                          |         |        |       |        |
|--------------------|--------------------------|-------|--------------------------|---------|--------|-------|--------|
|                    |                          | Paths |                          | $\beta$ | C.R.   | P     | Result |
| H1a                | VOC                      | →     | Reasons for adoption     | 0.199   | 3.065  | 0.002 | Yes    |
| H1b                | VOC                      | →     | Reasons against adoption | -0.229  | -3.827 | ***   | Yes    |
| H2                 | VOC                      | →     | ATT                      | 0.275   | 5.306  | ***   | Yes    |
| H3a                | Reasons for adoption     | →     | ATT                      | 0.173   | 2.823  | 0.005 | Yes    |
| H3b                | Reasons against adoption | →     | ATT                      | -0.418  | -7.707 | ***   | Yes    |
| H4a                | Reasons for adoption     | →     | AI                       | 0.113   | 1.983  | 0.047 | Yes    |
| H4b                | Reasons against adoption | →     | AI                       | -0.220  | -3.801 | ***   | Yes    |
| H5                 | ATT                      | →     | AI                       | 0.275   | 4.469  | ***   | Yes    |
| H6                 | VOC                      | →     | AI                       | 0.285   | 5.384  | ***   | Yes    |
| Second-order paths |                          |       |                          |         |        |       |        |
|                    |                          | Paths |                          | $\beta$ | C.R.   |       |        |
|                    | Reasons for adoption     | →     | PEOU                     | 0.728   |        |       |        |
|                    | Reasons for adoption     | →     | PU                       | 0.710   | 9.329  |       |        |
|                    | Reasons for adoption     | →     | PE                       | 0.744   | 7.701  |       |        |
|                    | Reasons against adoption | →     | UB                       | 0.856   |        |       |        |
|                    | Reasons against adoption | →     | RB                       | 0.723   | 11.635 |       |        |
|                    | Reasons against adoption | →     | VB                       | 0.773   | 12.544 |       |        |
|                    | Reasons against adoption | →     | TB                       | 0.760   | 12.095 |       |        |
|                    | Reasons against adoption | →     | IB                       | 0.742   | 12.61  |       |        |

Fit indices:  $X^2=838.078$ ;  $DF=478$ ;  $X^2/DF=1.753$ ;  $GFI=0.883$ ;  $TLI=0.959$ ;  $NFI=0.918$ ;  $CFI=0.963$ ;  $RMSEA=0.045$ ;  $SRMR=0.068$   
 \* $p<0.05$ ; \*\* $p<0.010$ ; \*\*\* $p<0.001$

sports. Value barriers ( $\beta=.773$ ), traditional barriers ( $\beta=.76$ ), image barriers ( $\beta=.742$ ), and risk barriers ( $\beta=.723$ ) also have similar impacts and show varying degrees of declining trends.

## Discussion and Implications

Firstly, this study uses Behavioral Reasoning Theory (BRT) to develop and test a model aimed at understanding the decision-making process of sports participants using digital technology for sports engagement. By considering the reasons for adoption and against adoption of digital technology, the study clarifies the behavioral decision-making process of sports participants. Consistent with previous findings (Pillai & Sivathanu, 2018; Sivathanu, 2018a), the reasons for adoption positively influence sports participants' attitudes and intentions to adopt digital technology, while the reasons against adoption negatively impact their attitudes and intentions,

indicating that sports participants' psychological and behavioral reactions to adopting digital technology are also influenced by resistance factors. This finding supports the Behavioral Reasoning Theory (Westaby, 2005), which posits that both reasons for and against a specific behavior influence individuals' attitudes and decision-making, ultimately confirming that these opposing motivations jointly affect sports participants' attitudes and behavioral decisions regarding digital technology use.

Secondly, this study reveals the relative impact of reasons for and against adoption digital technology for sports engagement on sports participants. The size of the standardized path coefficients suggests that reasons for adoption are stronger predictors of attitudes and behaviors towards using digital technology than reasons against adoption. These findings provide a theoretical basis for exploring the psychological impact of adopting new technology on sports participants. This conclusion aligns with the view that sports consumers are often

silent about technological innovation (Naraine, 2019) but contrasts with some previous empirical analyses that offer contradictory results. For example, in the case of car-sharing services, reasons for adoption have a greater relative impact on attitudes and intentions than reasons against adoption (Claudy et al., 2015). In contrast, regarding fan experience apps, reasons against adoption have a more substantial impact than reasons for adoption (Uhrich, 2022).

Moreover, another contribution of this study is the identification of specific elements of reasons for adoption and against adoption and the analysis of their relative relationships with higher-order reasons for and against digital technology use for sports engagement. It was found that participants' perceived enjoyment is most strongly associated with their overall reasons for adoption digital technology for sports engagement, consistent with Uhrich (2022) findings, suggesting that sports consumers are more likely to accept new technologies they find enjoyable during the decision-making process. Conversely, usage barriers are the most strongly correlated factor with reasons against adoption digital technology, as the experience of usage barriers stems from the notion that innovation requires changing valued consumer habits. When consumers perceive that new innovations do not require much effort, they are more likely to accept them (Msaed et al., 2017). Therefore, the greater the perceived barriers to using digital technology for sports engagement, the more likely participants are to reject it.

Lastly, this study also explores how values (openness to change) affect reasons and attitudes. The results, consistent with previous research (Gupta & Arora, 2017b; Sivathanu, 2018a), show that values positively and significantly influence reasons for adoption and attitudes towards using digital technology for sports engagement, while they negatively impact reasons against adoption. Since values play a guiding role and actually influence consumers' attitudes and ultimate intentions, it is essential to consider the target audience's perception of new products during the design and

development process. Developing creative digital technology products for those who enjoy novelty and challenges can provide higher levels of subjective satisfaction beyond basic sports participation, encouraging continued use of related digital technology.

## Conclusion and Future Outlook

Digital technology has significantly changed how billions of people engage in sports, with enhancing overall health being a key focus in relevant industries. However, the development, application, and promotion of digital technology should also consider sports participants' needs. This study uses Behavioral Reasoning Theory to examine sports participants' cognitive influences on decision-making from both adoption and against adoption perspectives. The findings show that both reasons for adoption and against adoption significantly influence attitudes and intentions towards using digital technology for sports engagement, with rejection reasons having a more substantial impact. Among these, usage barriers should be a primary focus to alleviate participants' concerns about adopting digital technology for sports engagement. Additionally, perceived enjoyment, as a key factor for adoption, should be prioritized by enhancing the fun aspects of related equipment and facilities. Designing and promoting innovative, challenging new products aligns with current consumer values of openness to change, making them more likely to be accepted by relevant groups and increasing the willingness to adopt and engage with digital technology.

One limitation of this study is the potential differences with other regions of the world due to economic, social, and cultural factors, suggesting that future research could expand the sample scope to clarify behavioral decision-making differences among various consumers. Secondly, this study uses a cross-sectional survey without longitudinal data collection; future longitudinal empirical designs could provide causal evidence for the model, determining whether there are

differences in decision-making processes over time and offering theoretical references for future trends. Thirdly, the current study focuses only on adoption intentions rather than user behavior. Future research could focus on actual behavior to identify gaps between intentions and real actions. Lastly, this study did not explore more specific factors related to reasons for adoption and against adoption of digital technology for sports engagement. For example, Uhrich (2022) identifies social risk and data security risk as specific barriers. Subsequent research could use qualitative methods to identify more detailed reasons, providing a more comprehensive theoretical basis for digital technology product development and promotion.

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### Author Contribution

1. Study concept and design: Rubin Qian, Kitak Kim
2. Acquisition of data: Rubin Qian
3. Analysis and interpretation of data: Rubin Qian, Kitak Kim
4. Drafting of the manuscript: Rubin Qian
5. Critical revision of the manuscript for important intellectual content: Rubin Qian, Kitak Kim
6. Administrative, technical, and material support: Rubin Qian, Kitak Kim
7. Study supervision: Kitak Kim

### References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, **50**(2), 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Ajzen, I. (2001). Nature and hew operation of attitudes. *Annual Review of Psychology*, **52**(1), 27-58.
- <https://doi.org/10.1146/annurev.psych.52.1.27>
- Akdim, K., Casalo, L. V., & Flavián, C. (2022). The role of utilitarian and hedonic aspects in the continuance intention to use social mobile apps. *Journal of Retailing and Consumer Services*, **66**, 102888. <https://doi.org/10.1016/j.jretconser.2021.102888>
- Alharbi, S., & Drew, S. (2014). Using the technology acceptance model in understanding academics' behavioural intention to use learning management systems. *International Journal of Advanced Computer Science and Application*, **5**(1), Article 1. <https://doi.org/10.14569/IJACSA.2014.050120>
- Amin, K., Akter, A., & Azhar, A. (2017). Factors affecting private university students' intention to adopt e-learning system in Bangladesh. *Daffodil International University Journal of Business and Economics*, **10**, 10-25.
- Anayat, S., Rasool, G., & Pathania, A. (2023). Examining the context-specific reasons and adoption of artificial intelligence-based voice assistants: A behavioural reasoning theory approach. *International Journal of Consumer Studies*, **47**(5), 1885-1910. <https://doi.org/10.1111/ijcs.12963>
- Ashfaq, M., Zhang, Q., Ali, F., Waheed, A., & Nawaz, S. (2021). You plant a virtual tree, we'll plant a real tree: Understanding users' adoption of the Ant Forest mobile gaming application from a behavioral reasoning theory perspective. *Journal of Cleaner Production*, **310**, 127394. <https://doi.org/10.1016/j.jclepro.2021.127394>
- Bagozzi, R. P. (1992). The self-regulation of attitudes, intentions, and behavior. *Social Psychology Quarterly*, **55**(2), 178. <https://doi.org/10.2307/2786945>
- Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, **16**(1), 74-94. <https://doi.org/10.1007/BF02723327>
- Box-Steffensmeier, J. M., Burgess, J., Corbetta, M., Crawford, K., Duflo, E., Fogaraty, L., ... & Wagner,

- C. (2022). The future of human behaviour research. *Nature Human Behaviour*, **6**(1), 15-24. <https://doi.org/10.1038/s41562-021-01275-6>
- Bruner, G. C., & Kumar, A. (2005). Explaining consumer acceptance of handheld Internet devices. *Journal of Business Research*, **58**(5), 553-558. <https://doi.org/10.1016/j.jbusres.2003.08.002>
- Campbell, T., Ngo, B., & Fogarty, J. (2008). Game design principles in everyday fitness applications. *Proceedings of the 2008 ACM Conference on Computer Supported Cooperative Work*, 249-252. <https://doi.org/10.1145/1460563.1460603>
- Canhoto, A. I., & Arp, S. (2017). Exploring the factors that support adoption and sustained use of health and fitness wearables. *Journal of Marketing Management*, **33**(1-2), 32-60. <https://doi.org/10.1080/0267257X.2016.1234505>
- Casidy, R., Lwin, M., & Phau, I. (2017). Investigating the role of religiosity as a deterrent against digital piracy. *Marketing Intelligence & Planning*, **35**(1), 62-80. <https://doi.org/10.1108/MIP-11-2015-0221>
- Chen, P.-T., & Kuo, S.-C. (2017). Innovation resistance and strategic implications of enterprise social media websites in Taiwan through knowledge sharing perspective. *Technological Forecasting and Social Change*, **118**, 55-69. <https://doi.org/10.1016/j.techfore.2017.02.002>
- Claudy, M. C., Garcia, R., & O'Driscoll, A. (2015). Consumer resistance to innovation—A behavioral reasoning perspective. *Journal of the Academy of Marketing Science*, **43**(4), 528-544. <https://doi.org/10.1007/s11747-014-0399-0>
- Claudy, M. C., Peterson, M., & O'Driscoll, A. (2013). Understanding the attitude-behavior gap for renewable energy systems using behavioral reasoning theory. *Journal of Macromarketing*, **33**(4), 273-287. <https://doi.org/10.1177/0276146713481605>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, **13**(3), 319-340. <https://doi.org/10.2307/249008>
- Dhir, A., Koshta, N., Goyal, R. K., Sakashita, M., & Almotairi, M. (2021). Behavioral Reasoning Theory (BRT) perspectives on e-waste recycling and management. *Journal of Cleaner Production*, **280**, 124269. <https://doi.org/10.1016/j.jclepro.2020.124269>
- Dilmeri, A., King, T., & Dennis, C. (2017). Toward a framework for identifying attitudes and intentions to music acquisition from legal and illegal channels: Attitudes and Intentions to Acquire Music. *Psychology & Marketing*, **34**(4), 428-447. <https://doi.org/10.1002/mar.20998>
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Harcourt Brace Jovanovich College Publishers.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley Pub.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, **18**(1), 39-50. <https://doi.org/10.2307/3151312>
- Goebert, C., & Greenhalgh, G. P. (2020). A new reality: Fan perceptions of augmented reality readiness in sport marketing. *Computers in Human Behavior*, **106**, 106231. <https://doi.org/10.1016/j.chb.2019.106231>
- Gupta, A., & Arora, N. (2017a). Consumer adoption of m-banking: A behavioral reasoning theory perspective. *International Journal of Bank Marketing*, **35**(4), 733-747. <https://doi.org/10.1108/IJBM-11-2016-0162>
- Gupta, A., & Arora, N. (2017b). Understanding determinants and barriers of mobile shopping adoption using behavioral reasoning theory. *Journal of Retailing and Consumer Services*, **36**, 1-7. <https://doi.org/10.1016/j.jretconser.2016.12.012>
- Ha, J.-P., Kang, S. J., & Ha, J. (2015). A conceptual framework for the adoption of smartphones in a



- sports context. *International Journal of Sports Marketing and Sponsorship*, **16(3)**, 2-19. <https://doi.org/10.1108/IJSMS-16-03-2015-B002>
- Hair, J., Gabriel, M., & Patel, V. (2014). AMOS Covariance-Based Structural Equation Modeling (CB-SEM): Guidelines on its application as a marketing research tool. *Revista Brasileira de Marketing*, **13**, 44-55. <https://doi.org/10.5585/remark.v13i2.2718>
- Hallmann, K., & Giel, T. (2018). eSports – Competitive sports or recreational activity? *Sport Management Review*, **21(1)**, 14-20. <https://doi.org/10.1016/j.smr.2017.07.011>
- Hew, J.-J., Lee, V.-H., & Leong, L.-Y. (2023). Why do mobile consumers resist mobile commerce applications? A hybrid fsQCA-ANN analysis. *Journal of Retailing and Consumer Services*, **75**, 103526. <https://doi.org/10.1016/j.jretconser.2023.103526>
- Hew, J.-J., Leong, L.-Y., Tan, G. W.-H., Lee, V.-H., & Ooi, K.-B. (2018). Mobile social tourism shopping: A dual-stage analysis of a multi-mediation model. *Tourism Management*, **66**, 121-139. <https://doi.org/10.1016/j.tourman.2017.10.005>
- Higgins, J. P. (2016). Smartphone applications for patients' health and fitness. *The American Journal of Medicine*, **129(1)**, 11-19. <https://doi.org/10.1016/j.amjmed.2015.05.038>
- Honkanen, P., Verplanken, B., & Olsen, S. O. (2006). Ethical values and motives driving organic food choice. *Journal of Consumer Behaviour*, **5(5)**, 420-430. <https://doi.org/10.1002/cb.190>
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, **6(1)**, 1-55. <https://doi.org/10.1080/10705519909540118>
- Huang, G., & Ren, Y. (2020). Linking technological functions of fitness mobile apps with continuance usage among Chinese users: Moderating role of exercise self-efficacy. *Computers in Human Behavior*, **103**, 151-160. <https://doi.org/10.1016/j.chb.2019.09.013>
- Jan, I. U., Ji, S., & Kim, C. (2023). What (de) motivates customers to use AI-powered conversational agents for shopping? The extended behavioral reasoning perspective. *Journal of Retailing and Consumer Services*, **75**, 103440. <https://doi.org/10.1016/j.jretconser.2023.103440>
- Jin, C., Xu, A., Zhu, Y., & Li, J. (2023). Technology growth in the digital age: Evidence from China. *Technological Forecasting and Social Change*, **187**, 122221. <https://doi.org/10.1016/j.techfore.2022.122221>
- Jin, C.-H. (2014). Adoption of e-book among college students: The perspective of an integrated TAM. *Computers in Human Behavior*, **41**, 471-477. <https://doi.org/10.1016/j.chb.2014.09.056>
- Kamakura, W. A., & Mazzon, J. A. (1991). Value segmentation: A model for the measurement of values and value systems. *Journal of Consumer Research*, **18(2)**, 208-218. <https://doi.org/10.1086/209253>
- Kasilingam, D. L. (2020). Understanding the attitude and intention to use smartphone chatbots for shopping. *Technology in Society*, **62**, 101280. <https://doi.org/10.1016/j.techsoc.2020.101280>
- Keiper, M. C., Fried, G., Lupinek, J., & Nordstrom, H. (2023). Artificial intelligence in sport management education: Playing the AI game with ChatGPT. *Journal of Hospitality, Leisure, Sport & Tourism Education*, **33**, 100456. <https://doi.org/10.1016/j.jhlste.2023.100456>
- Kim, Y., Kim, S., & Rogol, E. (2017). The effects of consumer innovativeness on sport team applications acceptance and usage. *Journal of Sport Management*, **31(3)**, 241-255. <https://doi.org/10.1123/jsm.2015-0338>
- Kleijnen, M., Lee, N., & Wetzels, M. (2009). Celik. *Journal of Economic Psychology*, **30(3)**, 344-357. <https://doi.org/10.1016/j.joep.2009.02.004>

- Ko, Y. J., Cattani, K., Chang, Y., & Hur, Y. (2011). Do spectators and competitors accept the use of scoring technology in Taekwondo competitions? *International Journal of Sport Management and Marketing*, **9(3/4)**, 238. <https://doi.org/10.1504/IJSM.2011.041574>
- Kottasz, R., Bennett, R., Vijaygopal, R., & Gardasz, B. (2021). Driverless futures: Current non-drivers' willingness to travel in driverless vehicles. *Journal of Marketing Management*, **37(15-16)**, 1656-1689. <https://doi.org/10.1080/0267257X.2021.1963309>
- Kruse, S. D., Rakha, S., & Calderone, S. (2018). Developing cultural competency in higher education: An agenda for practice. *Teaching in Higher Education*, **23(6)**, 733-750. <https://doi.org/10.1080/13562517.2017.1414790>
- Kumar, S., Gupta, K., Kumar, A., Singh, A., & Singh, R. K. (2023). Applying the theory of reasoned action to examine consumers' attitude and willingness to purchase organic foods. *International Journal of Consumer Studies*, **47(1)**, 118-135. <https://doi.org/10.1111/ijcs.12812>
- Laukkanen, T. (2016). Consumer adoption versus rejection decisions in seemingly similar service innovations: The case of the Internet and mobile banking. *Journal of Business Research*, **69(7)**, 2432-2439. <https://doi.org/10.1016/j.jbusres.2016.01.013>
- Laukkanen, T., Sinkkonen, S., & Laukkanen, P. (2009). Communication strategies to overcome functional and psychological resistance to Internet banking. *International Journal of Information Management*, **29(2)**, 111-118. <https://doi.org/10.1016/j.ijinfomgt.2008.05.008>
- Liao, C.-H., & Tsou, C.-W. (2009). User acceptance of computer-mediated communication: The SkypeOut case. *Expert Systems with Applications*, **36(3, Part 1)**, 4595-4603. <https://doi.org/10.1016/j.eswa.2008.05.015>
- Luo, W., & He, Y. (2021). Influence of sports applications on college students' exercise behaviors and habits: A thematic analysis. *Alexandria Engineering Journal*, **60(6)**, 5095-5104. <https://doi.org/10.1016/j.aej.2021.03.059>
- Lupton, D. (2020). 'Better understanding about what's going on': Young Australians' use of digital technologies for health and fitness. *Sport, Education and Society*, **25(1)**, 1-13. <https://doi.org/10.1080/13573322.2018.1555661>
- McLean, G., & Osei-Frimpong, K. (2019). Hey Alexa ... examine the variables influencing the use of artificial intelligent in-home voice assistants. *Computers in Human Behavior*, **99**, 28-37. <https://doi.org/10.1016/j.chb.2019.05.009>
- Msaed, C., Al-Kwafi, S. O., & Ahmed, Z. U. (2017). Building a comprehensive model to investigate factors behind switching intention of high-technology products. *Journal of Product & Brand Management*, **26(2)**, 102-119. <https://doi.org/10.1108/JPBM-06-2015-0915>
- Naraine, M. (2019). Follower segments within and across the social media networks of major professional sport organizations. *Sport Marketing Quarterly*, **28(4)**, 222-233. <https://doi.org/10.32731/SMQ.284.122019.04>
- Nguyen, H. V., Nguyen, N., Nguyen, B. K., Lobo, A., & Vu, P. A. (2019). Organic food purchases in an emerging market: The influence of consumers' personal factors and green marketing practices of food stores. *International Journal of Environmental Research and Public Health*, **16(6)**, Article 6. <https://doi.org/10.3390/ijerph16061037>
- Nguyen, T. T., Dang, H. Q., & Le-Anh, T. (2023). Impacts of household norms and trust on organic food purchase behavior under adapted theory of planned behavior. *Journal of Agribusiness in Developing and Emerging Economies*. <https://doi.org/10.1108/JADEE-10-2022-0218>
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Oye, N. D., A.Iahad, N., & Ab.Rahim, N. (2014). The history of UTAUT model and its impact on ICT

- acceptance and usage by academicians. *Education and Information Technologies*, **19(1)**, 251-270. <https://doi.org/10.1007/s10639-012-9189-9>
- Peterson, M., & Simkins, T. (2019). Consumers' processing of mindful commercial car sharing. *Business Strategy and the Environment*, **28(3)**, 457-465. <https://doi.org/10.1002/bse.2221>
- Pillai, R., & Sivathanu, B. (2018). An empirical study on the adoption of m-learning apps among IT/ITeS employees. *Interactive Technology and Smart Education*, **15(3)**, 182-204. <https://doi.org/10.1108/ITSE-01-2018-0002>
- Popkova, E. G., De Bernardi, P., Tyurina, Y. G., & Sergi, B. S. (2022). A theory of digital technology advancement to address the grand challenges of sustainable development. *Technology in Society*, **68**, 101831. <https://doi.org/10.1016/j.techsoc.2021.101831>
- Ram, S., & Sheth, J. N. (1989). Consumer resistance to innovations: The marketing problem and its solutions. *Journal of Consumer Marketing*, **6(2)**, 5-14. <https://doi.org/10.1108/EUM0000000002542>
- Rauniar, R., Rawski, G., Yang, J., & Johnson, B. (2014). Technology Acceptance Model (TAM) and social media usage: An empirical study on Facebook. *Journal of Enterprise Information Management*, **27(1)**, 6-30. <https://doi.org/10.1108/JEIM-04-2012-0011>
- Rokeach, M. (1973). *The nature of human values*. New York: Free Press.
- Ryan, J., & Casidy, R. (2018). The role of brand reputation in organic food consumption: A behavioral reasoning perspective. *Journal of Retailing and Consumer Services*, **41**, 239-247. <https://doi.org/10.1016/j.jretconser.2018.01.002>
- Sadiq, M. A., Rajeswari, B., Ansari, L., & Danish Kirmani, M. (2021). The role of food eating values and exploratory behaviour traits in predicting intention to consume organic foods: An extended planned behaviour approach. *Journal of Retailing and Consumer Services*, **59**, 102352. <https://doi.org/10.1016/j.jretconser.2020.102352>
- Sahu, A. K., Padhy, R. K., & Dhir, A. (2020). Envisioning the future of behavioral decision-making: A systematic literature review of behavioral reasoning theory. *Australasian Marketing Journal*, **28(4)**, 145-159. Scopus. <https://doi.org/10.1016/j.ausmj.2020.05.001>
- Schwartz, S. (2003). A proposal for measuring value orientations across nations. *Questionnaire package of the European Social Survey* (pp. 259-290).
- Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. *Advances in Experimental Social Psychology*, **25**, 1-65. [https://doi.org/10.1016/S0065-2601\(08\)60281-6](https://doi.org/10.1016/S0065-2601(08)60281-6)
- Seong, B.-H., & Hong, C.-Y. (2022). Corroborating the effect of positive technology readiness on the intention to use the virtual reality sports game "Screen Golf": Focusing on the technology readiness and acceptance model. *Information Processing & Management*, **59(4)**, 102994. <https://doi.org/10.1016/j.ipm.2022.102994>
- Sheth, J. N. (1981). Innovation resistance. The Less Developed Concept (LDC) in diffusion research. *Research in Marketing*, **4(3)**, 273-282.
- Sivathanu, B. (2018a). Adoption of Internet Of Things (IOT) based wearables for healthcare of older adults – A Behavioural Reasoning Theory (BRT) approach. *Journal of Enabling Technologies*, **12(4)**, 169-185. <https://doi.org/10.1108/JET-12-2017-0048>
- Sivathanu, B. (2018b). Adoption of online subscription beauty boxes: A Behavioural Reasoning Theory (BRT) perspective. *Journal of Electronic Commerce in Organizations*, **16(4)**, 19-40. <https://doi.org/10.4018/JECO.2018100102>
- Songkram, N., Chootongchai, S., Osuwan, H., Chuppunnarat, Y., & Songkram, N. (2023). Students' adoption towards behavioral intention of digital learning platform. *Education and Information Technologies*, **28(9)**, 11655-11677. <https://doi.org/10.1007/s10639-023-11637-4>

- Stockless, A. (2018). Acceptance of learning management system: The case of secondary school teachers. *Education and Information Technologies*, **23(3)**, 1101-1121. <https://doi.org/10.1007/s10639-017-9654-6>
- Talwar, S., Dhir, A., Kaur, P., & Mäntymäki, M. (2020). Barriers toward purchasing from online travel agencies. *International Journal of Hospitality Management*, **89**, 102593. <https://doi.org/10.1016/j.ijhm.2020.102593>
- Tewari, A., Mathur, S., Srivastava, S., & Gangwar, D. (2022). Examining the role of receptivity to green communication, altruism and openness to change on young consumers' intention to purchase green apparel: A multi-analytical approach. *Journal of Retailing and Consumer Services*, **66**, 102938. <https://doi.org/10.1016/j.jretconser.2022.102938>
- Tewari, A., Singh, R., Mathur, S., & Pande, S. (2023). A modified UTAUT framework to predict students' intention to adopt online learning: Moderating role of openness to change. *The International Journal of Information and Learning Technology*, **40(2)**, 130-147. <https://doi.org/10.1108/IJILT-04-2022-0093>
- Thompson, A., Naraine, M. L., & Parent, M. M. (2024). Exploring the nexus of digital technology and organizational change in non-profit sport organizations. *Sport Management Review*. <https://doi.org/10.1080/14413523.2024.2346633>
- Thong, J. Y. L., Hong, S.-J., & Tam, K. Y. (2006). The effects of post-adoption beliefs on the expectation-confirmation model for information technology continuance. *International Journal of Human-Computer Studies*, **64(9)**, 799-810. <https://doi.org/10.1016/j.ijhcs.2006.05.001>
- Tjøndal, A. (2022). The impact of COVID-19 lockdowns on Norwegian athletes' training habits and their use of digital technology for training and competition purposes. *Sport in Society*, **25(7)**, 1373-1387. <https://doi.org/10.1080/17430437.2021.2016701>
- Uhrich, S. (2022). Sport spectator adoption of technological innovations: A behavioral reasoning analysis of fan experience apps. *Sport Management Review*, **25(2)**, 275-299. <https://doi.org/10.1080/14413523.2021.1935577>
- Verma, V. K., Chandra, B., & Kumar, S. (2019). Values and ascribed responsibility to predict consumers' attitude and concern towards green hotel visit intention. *Journal of Business Research*, **96**, 206-216. <https://doi.org/10.1016/j.jbusres.2018.11.021>
- Westaby, J. D. (2005). Behavioral reasoning theory: Identifying new linkages underlying intentions and behavior. *Organizational Behavior and Human Decision Processes*, **98(2)**, 97-120. <https://doi.org/10.1016/j.obhdp.2005.07.003>
- Westmattmann, D., Grotenhermen, J.-G., Sprenger, M., Rand, W., & Schewe, G. (2021). Apart we ride together: The motivations behind users of mixed-reality sports. *Journal of Business Research*, **134**, 316-328. <https://doi.org/10.1016/j.jbusres.2021.05.044>
- Wiser, R. H. (2007). Using contingent valuation to explore willingness to pay for renewable energy: A comparison of collective and voluntary payment vehicles. *Ecological Economics*, **62(3-4)**, 419-432. <https://doi.org/10.1016/j.ecolecon.2006.07.003>
- Yadav, J., Misra, M., Rana, N. P., Singh, K., & Goundar, S. (2023). Blockchain's potential to rescue sports: A social media perspective. In *Distributed computing to blockchain* (pp. 405-414). Elsevier. <https://doi.org/10.1016/B978-0-323-96146-2.00025-5>
- Yang, C., & Cole, C. L. (2022). Smart stadium as a laboratory of innovation: Technology, sport, and datafied normalization of the fans. *Communication & Sport*, **10(2)**, 374-389. <https://doi.org/10.1177/2167479520943579>
- Zhang, T., Gensler, S., & Garcia, R. (2011). A study of the diffusion of alternative fuel vehicles: An agent-based modeling approach\*: Diffusion of

- alternative fuel vehicles. *Journal of Product Innovation Management*, **28(2)**, 152-168. <https://doi.org/10.1111/j.1540-5885.2011.00789.x>
- Zhong, X., Li, M., & Li, L. (2021). Preventing and detecting insufficient effort survey responding. *Advances in Psychological Science*, **29(2)**, 225-237. <https://doi.org/10.3724/SP.J.1042.2021.00225>
- Zhou, R., & Feng, C. (2017). Difference between leisure and work contexts: The roles of perceived enjoyment and perceived usefulness in predicting mobile video calling use acceptance. *Frontiers in Psychology*, **8**, 350. <https://doi.org/10.3389/fpsyg.2017.00350>