ADOPTING NEW TECHNOLOGIES IN SPORTS MARKETING

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ADOPTING NEW TECHNOLOGIES IN SPORTS MARKETING

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EDITORIAL
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Editorial: Adopting New Technologies in Sports Marketing

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Editorial on the Research Topic

Adopting New Technologies in Sports Marketing

New technologies have revolutionized nearly every aspect of human existence, impacting how companies commercialize goods and services (Grewal et al., 2020). More radical innovations are quickly emerging on the heels of the present generation of innovations, such as greater computing capacity, the Internet, social media, and mobile devices and applications. These technological advances are exerting profound effects on the practice of marketing (Gillpatrick, 2019). Specifically, applications and solutions of technological innovations compel marketers to pre-emptively test their unpredictable outcomes and effects (Kumar and Ramachandran, 2018).

New technologies are also rapidly revolutionizing the sport industry landscape, providing sport marketers—from small sport retailers to top sport brands—with novel methods to reach customers. For example, technological innovations, such as augmented reality (AR; Goebert and Greenhalgh, 2020), sport wearable technology (Kim and Chiu, 2019), the meteoric rise of mobile commerce and smartphones (Kim et al., 2017), and virtual reality (VR; Uhm et al., 2020), have driven major changes in the sport industry and influenced how sport markets are managed. These emerging technologies are fundamentally transforming sport consumer experiences and expanding the boundaries of sport marketing research.

Studies of new technology in sport, however, have been largely neglected in the greater body of sport marketing literature with minimal attention to their merits or demerits (Ratten, 2020a). In fact, studies on new technologies in sport marketing have been mainly published in journals of other disciplines rather than those dedicated to sport marketing (e.g., Kim and Ko, 2019; Goebert and Greenhalgh, 2020). Greater scholarly attention to adopting new technologies in sport marketing is needed to better understand and embrace these innovations in the sports industry. The COVID-19 pandemic has shown us that there is a need for sport technology, particularly when cities and countries have lockdowns that restrict the ability of individuals to play and watch sport (Ratten, 2020b).

This Editorial and four articles introduce and add to the growing body of knowledge regarding the development and use of technology in sport marketing.

Two of the articles contribute new knowledge regarding the theme of new media and communication tools. Particularly in the era of COVID-19, these two articles underscore how these media technologies offer sport consumers a sense of safety while simultaneously creating the impression of exercising and spectating a match in a real stadium despite being at home. Explaining how the COVID-19 pandemic has affected athletic events and communications in sports, Zaborova et al. present telecommunication technologies commonly utilized to enable children to perform basic gymnastic exercises at home. Specifically, Zaborova et al. explore how virtual technology can

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be employed in the field of education. Similarly, Lupinek et al. provide a virtual reality (VR) In-Game Advertising (IGA) congruity framework that seeks to help marketers make well-reasoned IGA development decisions through strategic choices. According to Lupinek et al., the centralized VR IGA congruity framework not only enhances brand awareness but also imbues participants with a favorable mindset toward the IGA, ultimately increasing sales activation. In this respect, we can assume that VR is emerging as a powerful marketing tool by eliciting novel and enjoyable consumer experiences. The studies of Zaborova et al. and Lupinek et al. showed that new media technologies, such as virtual and augmented reality, are expected to continue advancing and see active application within the sports industry.

The other two articles include an investigation of social media engagement for women's sport and a valuation of sport media service. Pegoraro et al. examine how broadcasting impacts social media engagement with respect to game day WNBA team account posts, discussing how digitally streaming live sport events offers opportunities for women's sport and niche sport that lack television contracts and/or have limited resources to support their own digital streaming services. Furthermore, Pegoraro et al. consider advances in technology and changes in consumer preferences and explore how behaviors have led to numerous new broadcast options for sport leagues to distribute their contents directly to the sport market and consumers by expanding a range of choices. In addition, based on the unified theory of acceptance and the use of the technology model, Huettermann et al. build and empirically test a conceptual model of factors leading people to accept a novel sport club video service. In particular, Huettermann et al. assessed potential users' willingness to pay for a total sport club video service solution from production to distribution. Huettermann et al. provide practical implications for forward-looking developers by pinpointing relevant factors that are persuasive to sport managers willing to adopt new technologies.

The four studies that contribute to this Research Topic vary in their inquiries into existing knowledge, such as what kinds of new technologies are presently being adopted in sport marketing, how marketing strategies are implemented through new technologies, and what factors have caused these new technologies to be applied in the sport market. These studies do not inclusively mention every new technology in the sport industry as, for example, artificial intelligence (Davenport, 2018) and robotics (Mende et al., 2019) are currently being introduced into the sport marketing field. However, it is expected that this Research Topic serves as a cornerstone to attract readers' attention in that it provides a variety of knowledge about technologies that have thus far received little attention among sport marketing scholars.

In conclusion, our examination of this Research Topic has resulted in a novel collection of articles that further our knowledge of new technologies in sport marketing. The wealth of contents presented within this Research Topic is illustrative of the growing interest in the greater area of new technologies in sport marketing and thus provides a stepping stone to further innovative studies. We hope that the articles selected here will act as a potent stimulus for research in this exciting area and encourage the exploration of future topics that may build upon the findings presented in these papers.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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OPINION
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Pandemical Influence on Athletic Events and Communications in Sport

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INTRODUCTION

The first notifications of a new coronavirus infection came from China at the end of 2019 (The 2019-nCoV Outbreak Joint Field Epidemiology Investigation Team, 2020). In March 2020, WHO announced the onset of a new global pandemic [Coronavirus disease (COVID-19), 2019]. In Russia, the first cases of coronavirus infection were recorded in February of this year[1]. Currently, the epidemic has affected most countries of the world and more than half of the constituent entities of the Russian Federation.

Earlier than other countries, the epidemic began in China—and to date, most experts recognize it as liquidated (Arshad et al., 2020). At the same time, the main emphasis was placed on medical prophylactic, including isolation measures, as no specific treatment or vaccine against COVID-19 has been developed to date.

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SOCIAL CONSEQUENCES OF THE EPIDEMIC

Up till now there is no specific treatment for coronavirus infection, and a vaccine against it is only being developed, the main tactic of prevention is quarantine. The quarantine applies to persons who have been diagnosed with COVID-19, to those who have contacted them without special protective equipment, and also to people who have returned from epidemiologically disadvantaged regions.

The psychological effects of quarantine-related social exclusion over COVID-19 remains to be explored. However, the experience of previous epidemics indicates the development of depression, discomfort, loss of life values, and loss of confidence in the future. In some cases, psychological discomfort was the primary reason that people did not comply with the quarantine regime (Merchant and Lurie, 2020).

In addition, there is an overwhelming stream of information on the problem, including a lot of fake. The experience of previous epidemics shows that it is difficult for the population to navigate the flow of information, to choose reliable information from it. Some tend to panic (Shimizu, 2020). A number of studies have addressed the issue of emigration, stigma, racism, and COVID-19. It was noted that foreign students studying in China during the epidemic were most afraid of being separated from their families (Zhai and Du, 2020). Others were afraid that they would be humiliated at home as potential carriers of a new infection (British-Chinese people tell of 'discrimination' hate as fears rise over coronavirus, 2020).

People who were quarantined for COVID-19 showed an increased level of anxiety. This fact may be associated with frequently occurring sleep disorders in people who were in social isolation (Xiao et al., 2020a). In addition, sleep disturbances were noted in medical personnel who were forced to process during the epidemic and often faced a problem of misunderstanding on behalf of patients (Xiao et al., 2020b).

[1] COVID-19 coronavirus pandemic. Retrieved from https://www.worldometers.info/coronavirus/#countries.html.

Another social consequence of quarantine associated with COVID-19 is the economic downturn (Kinross et al., 2020)[2]. It is caused by the fact that people who are in social isolation, to one degree or another, drop out of the real production sector. The consumer basket is changing. The demand for personal protective equipment and hygiene is growing. Health system costs are increasing (Ayittey et al., 2020). The economic impact of the COVID-19 epidemic globally remains to be assessed (Duan et al., 2020; Johnson et al., 2020). But now, a decline in tourism and the transport industry is already evident. How long such changes will last is not known.

HOW THE EPIDEMIC AFFECTS THE SPORTS

One of the areas of life affected by the COVID-19 pandemic is sports. As part of the prevention of coronavirus transmission, mass sporting events are prohibited. Therefore, many competitions are either rescheduled or held without spectators (**Table 1**)[3]. NHL Cup discontinued ahead of time. Even the Olympic Games of 2020 were postponed (Gallego et al., 2020). Some international competitions are now held in virtual format. So, the FIFA-2020 championships of England, Spain, Italy will be held online[4]. Former Russian tennis player Marat Safin won the virtual US Open. In the final, the Russian defeated Spaniard Rafael Nadal. The winner was determined by voting on the official "twitter" and "Instagram" of the competition[5].

In many countries, as part of quarantine measures, sports sections and circles have stopped working. Due to social isolation, people reduce their daily activity, which can lead to an increased likelihood of developing and/or progressing chronic non-communicable diseases. Special complexes of physical exercises are being developed for people forced to quarantine (Chen et al., 2020).

A number of famous athletes were infected with a coronavirus, for example, Thiago Ceibut-Wild, Marco Sportiello, trainer Fatih Terim. Boxer Anthony Joshua quit self-isolation since he was in contact with Prince Chals. Lionel Messi, Cristiano Ronaldo, Conor McGregor, Georges Mendes and several other famous athletes donated money for the treatment of patients with COVID-19. Such messages caused a great resonance in the media and attracted increased attention to the topics of sports and COVID-19. Due to the economic downturn, spending on sports is declining. So Madrid REAL will soon train without wages.

CHANGE IN SPORTS COMMUNICATION DUE TO CORONAVIRUS

In many countries of the world, a self-isolation regime has been introduced, which suggests that the movement of people outside their own apartment (house) is minimized. Often during the quarantine period, a ban on visiting sports infrastructure facilities is introduced. All this makes it impossible to conduct training of sports teams. Therefore, some experts propose the development of special complexes for team members who are forced to stay at home in an epidemic.

A long restriction in the organization of the training process can lead to a local decline in results in all sports disciplines. It becomes extremely important to develop modern and effective training techniques in the face of such restrictions. The sports world has not encountered a similar situation before and this is a huge challenge for the entire sports scientific community. At the same time, this can become an impetus for the revision of views on the existing approaches in the training of athletes, the development and implementation of completely new views on the construction of the training process, which will remain effective in sports after the end of restrictive measures.

For example, Playmaker School organized online basketball lessons for children at home. The only thing is that you need to have high ceilings (at least 3.5 m), while the standard height of the ceilings of apartments in Russia is 2.5 m.

Irina Wiener International Sports Academy has organized a virtual sports hall for students. Children will learn how to perform basic gymnastic exercises at home using telecommunication technologies. Video lessons are grouped by the age categories of students: a set of exercises for preschoolers is designed to form the correct posture and musculoskeletal system, as well as to develop flexibility, and the number of exercises for primary school students includes physical education, dance exercises, exercise[6]. The most difficult types of sports are those where a stadium or sports ground is usually required for training. For example, Juventus Academia has developed a special set of exercises that can be performed at home, but at the same time carry out training on the speed of reaction, running, passing the ball. It is proposed to make a video from your own training, send it to receive feedback.

Another football school for adults Life & football has developed temporarily suspended training. The system of exercises is currently being reviewed and a quarantine strategy is being developed without going online, as school representatives consider it impossible to train without the personal interaction of team members[7]. Due to social isolation, people reduce their daily activity, which can lead to an increased likelihood of developing and/or progressing chronic noncommunicable diseases. A number of researchers emphasize the importance

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TABLE 1 | Examples of sporting events, the schedule of which has changed over the past 10 days due to coronavirus infection.

Date	Competition
25 March	DIVING: British Swimming cancels the London leg of the 2020 Fina Diving World Series. It had initially been postponed. FOOTBALL: The suspension of Japan's J League is extended into May, along with the associated cup competition. FOOTBALL: UNICEF's Soccer Aid fundraiser, scheduled to take place at Old Trafford on 6 June, is postponed. MOTORSPORT: The opening three rounds of the British Superbike Championship—at Silverstone, Oulton Park and Donington Park—are confirmed as postponed. SWIMMING: British Swimming cancels all its end of season domestic championships.
24 March	CYCLING: The fifth round of the UCI Mountain Bike World Cup, due to take place on 6–7 June in Fort William, is canceled. DARTS: All five Premier League events scheduled for April are postponed. DISABILITY SPORT: The Paralympic Games in Tokyo, scheduled to start on 25 August, are postponed until 2021. GOLF: Golf courses in England and Wales will shut following the latest government measures to tackle the coronavirus pandemic. HORSE RACING: Horse racing in Ireland is suspended until at least 19 April. OLYMPICS: The International Olympic Committee confirms Tokyo 2020, due to begin on 24 July, is postponed until next year. ROWING: The Henley Royal Regatta, which was due to be held from 1 to 5 July, is canceled. RUGBY UNION: The Champions Cup and Challenge Cup semi-finals and finals are postponed. Both finals were due to take place in Marseille on weekend of 22–23 May. DARTS: The fifth and sixth rounds of the world rally championship in Portugal and Italy, due to take place in May and June, are postponed
23 March	BOXING: British Boxing Board of Control suspends all events until the end of April. FOOTBALL: All football in Spain, including La Liga, is put on hold indefinitely while the country deals with the spread of coronavirus. FOOTBALL: The Irish Football Association extends the suspension of the football season in Northern Ireland until 30 April. FOOTBALL: Uefa postpones the Champions League and Europa League finals, scheduled for 30 May and 27 May respectively, as well as the Women's Champions League final, which was due to take place on 24 May. FORMULA 1: The Azerbaijan Grand Prix, due to take place on 7 June, becomes the eighth race of the 2020 season to be postponed or canceled. RUGBY LEAGUE: Australia's National Rugby League, which had been continuing behind closed doors, is suspended.
22 March	FOOTBALL: Former Manchester United midfeveryielder Marouane Fellaini, who plays for Chinese club Shandong Luneng, confirms he has tested positive for coronavirus. HORSE RACING: The Dubai World Cup, one of the world's richest horse races, due to take place on 28 March, is postponed. OLYMPICS: The International Olympic Committee gives itself a four-week deadline to make a decision on the postponement of Tokyo 2020.
21 March	CRICKET: The proposed seven-match series between Ireland and Bangladesh is postponed. The games were scheduled to be held in Belfast and England in May. FOOTBALL: Southampton chief executive Martin Semmens suggests the Premier League could resume before virus restrictions are lifted. FOOTBALL: Former Real Madrid president Lorenzo Sanz dies after being taken to hospital with coronavirus. FOOTBALL: Juventus and Argentina forward Paulo Dybala and former Italy captain Paolo Maldini test positive for coronavirus. FOOTBALL: Three Portsmouth players - James Bolton, Andy Cannon and Sean Raggett—test positive for coronavirus. FORMULA 1: World champion Lewis Hamilton says he is self-isolating after coming into contact with actor Idris Elba, who has tested positive for coronavirus. ICE HOCKEY: The International Ice Hockey Federation cancels the 2020 World Championship in Zurich and Lausanne. OLYMPICS: USA Track and Field, athletics' US governing body, calls for this summer's Olympics in Tokyo to be delayed. OLYMPICS: The Brazilian Olympic Committee (COB) calls for this year's Tokyo Olympics to be suspended.
20 March	AQUATICS: The European Aquatics Championships (swimming, diving, artistic (formerly synchronized) swimming and water polo) scheduled to take place in Budapest in May are postponed and provisionally rescheduled for 17–30 August. CRICKET: The ECB announces that the county cricket season is delayed by seven weeks and will not start before 28 May. RUGBY UNION: The Welsh Rugby Union has canceled all league and cup competitions for the rest of the season. The cancellation means there will be no promotion or relegation in any WRU league, with all teams remaining in their current division. RUGBY UNION: The RFU confirms the end of the 2019–2020 season for all levels below the Premiership because of coronavirus. SKATEBOARDING: The World Skate Olympic qualifying event in Long Beach, California, scheduled for 7–10 May, is postponed. SNOOKER: The World Snooker Championship, which was scheduled to take place from 18 April to 4 May, has been postponed.
19 March	DARTS: The Professional Darts Corporation announces the Players Championship double-headers and Unicorn Challenge Tour weekend planned during April have been postponed. FOOTBALL: English football is suspended until 30 April at the earliest, with the end of the 2019–2020 season extended indefinitely. FOOTBALL: Borussia Monchengladbach's players and coaching staff accept pay cuts during the coronavirus crisis. FOOTBALL: The Nigeria Football Federation (NFF) suspends its football league for four weeks due to the outbreak. FOOTBALL: Major League Soccer extends the suspension of all matches, with a target return date of 10 May. FOOTBALL: The Turkish Super Lig is suspended—the last major European league to do so. FOOTBALL: Rotherham manager Paul Warne confirms two of his players are in self-isolation after displaying symptoms of coronavirus. FORMULA 1: The Monaco Grand Prix is canceled and the Dutch and Spanish Grands Prix are postponed, with F1 bosses also announcing a delay to new regulations planned for 2021. HOCKEY: Great Britain's FIH Pro League games on 2–3 May and 16–17 May are postponed. MOTORSPORT: The Southern 100 road races due to take place in July on the Isle of Man are canceled. NFL: New Orleans Saints head coach Sean Payton tests positive for coronavirus, the first known case in the NFL.
18 March	ATHLETICS: All 675 UK Parkrun events are put on hold, initially until the end of March. BASEBALL: A Cincinnati Reds employee based at their spring training facility in Arizona has tested positive for coronavirus.

(Continued)

TABLE 1 | Continued

Date	Competition
	CRICKET: The ECB recommends all forms of recreational cricket is suspended until further notice. FOOTBALL: The Asian Football Confederation announces all matches in the AFC Cup tournament, the second-tier club competition, are postponed. Games in the west of Asia had already been suspended. FOOTBALL: La Liga club Deportivo Alaves announce 15 staff members—including three players—have tested positive for coronavirus. FOOTBALL: The Leasing.com Trophy final between Portsmouth and Salford City on 5 April is postponed. FORMULA 1: The three-week summer break has been moved forward from August to March and April. GYMNASTICS: The Artistic Gymnastics All-Around World Cup event scheduled to take place in Tokyo in April is canceled. HORSE RACING: Racing in Ireland to continue but behind closed doors, with a maximum of one meeting per day. ICE HOCKEY: Great Britain's two fixtures against Hungary on 21 and 22 April are canceled. MOTORSPORT: The Le Mans 24 H, scheduled to take place on 13–14 June, has been postponed and rearranged for 19–20 September. MOTORSPORT: The IndyCar Grand Prix of Long Beach, scheduled for 19 April, is canceled. The race will return next year. TENNIS: ATP and WTA extend suspension of all top-level tennis until 7 June. TRIATHLON: British Triathlon announces the Leeds Triathlon, due to take place on 6-7- June, is postponed.
17 March	ATHLETICS: Diamond League postpones the first three meetings of the 2020 season, scheduled for Qatar and China. ATHLETICS: Club training sessions, events, competitions, club committee and face-to-face meetings, athlete camps, running groups and social events are suspended in England, Scotland and Wales. BASKETBALL: The British Basketball League postpones the 2019/20 season until further notice. BOXING: All boxing events canceled until the start of April by the British Boxing Board of Control. CRICKET: England cricketer Alex Hales is in self-isolation after developing coronavirus symptoms following his return to the UK from playing in the Pakistan Super League. CRICKET: Pakistan Super League is postponed, on the day the semi-finals were due to take place. CRICKET: ECB to meet on Thursday to look at possible rescheduling the cricket summer. The County Championship season is scheduled to start on 12 April, but counties are due to play fixtures from 2 April in preparation. CYCLING: The Tour de Yorkshire, scheduled to take place between 30 April and 3 May, is postponed with no new date yet announced. CYCLING: The sport's governing body, the UCI, postponed the prestigious one-day races Paris-Roubaix and Liege-Bastogne-Liege. Paris-Roubaix was due to be held on 12 April, with Liege-Bastogne-Liege two weeks later. The Fleche Wallone—one of the Ardennes classics—set for 22 April was also canceled. DARTS: The forthcoming PDC Development Tour events on 21–22 March and the Players Championship weekend on 28–29 March are postponed. DIVING: The Fina Diving World Series finale, which was scheduled to take place at the London Aquatics Center between 27 and 29 March, is postponed. EQUESTRIAN: British Eventing cancels all fixtures with immediate effect, a fortnight after its scheduled eight-month season began. FOOTBALL: Euro 2020 has been postponed until 2021. FOOTBALL: Liverpool announce the final Hillsborough memorial service, due to take place at Anfield on 15 April, is postponed. FOOTBALL: The two-legged play-off between Cameroon and Chile for a place at the 2020 Tokyo Olympics, initially scheduled for April, is postponed. FOOTBALL: The African Nations Championship, for players who are based in Africa, is postponed. GYMNASTICS: The women's European Championships set for the end of April in Paris and the men's event in Baku at the end of May are canceled by the European Gymnastics Union. HORSE RACING: All racing in Great Britain will be suspended from Wednesday until the end of April. HORSE RACING: The 146th Kentucky Derby in the United States will be rescheduled from 2 May to 5 September. MIXED MARTIAL ARTS: UFC president Dana White says the next three fight nights are postponed. SNOOKER: World Snooker postpones the Coral Tour Championship in Llandudno, which was set to begin on Tuesday. SURFING: World Surf League cancels or postpones all events until at least the end of May. SWIMMING: British Swimming announces the GB Olympic and Paralympic Trials, due to take place between 14 and 19 April are canceled. TENNIS: French Open postponed until September. TRAMPOLINING: The European Trampoline Championships in Sweden from 7 to 10 May are called off. TRIATHLON: British Triathlon, Triathlon England, Triathlon Scotland and Welsh Triathlon suspend organized triathlon activity until at least 30 April.

of maintaining high physical activity even in an epidemic. This is a factor in the prevention of a number of chronic noncommunicable diseases. In addition, physical activity allows you to maintain a positive mood and prevents the development of depression. However, for most people, the training conditions need to be reviewed, due to the limited dimensions of their own housing, the lack of special equipment or its insufficient completeness, etc. Special complexes of physical exercises are being developed for people forced to quarantine[8]. The All-Russian Physical Culture and Sports Society "Labor Reserves" joined the action of the Ministry of Sports of the Russian Federation "Train at home. Sport is the norm." As part of the Promotion, the Company developed a free training marathon so that the Russians did not stop engaging in physical activity for the time of self-isolation. Anyone can take part in it, regardless of age and geography. All exercises can be performed at home, without violating the regime of self-isolation. More than 2,500 participants have already registered for the first stream of free training, and not only from Russia. In online mode, they train with society from Ukraine, Belarus, Germany, and Spain. More than 2.5 thousand participants have already registered for the second stream. In many countries, as part of quarantine measures, sports sections and circles have stopped working. On-line courses are offered for persons who wish to continue sports with a trainer in the Russian Federation. So, Taekwondo Kerugi Schools arrange classes through Zoom. Fight Pro Unity

[8]Labor Reserves Society launched an all-Russian online project of free training. Retrieved from https://trudovyerezervy.ru/news/obshchestvo-trudovye-rezervyzapustilo-vserossiyskiy-onlayn-proekt-besplatnykh-trenirovok/html.

Club uses the Ivideon service[9]. Fitness clubs in Moscow UFC Gym network launched many directions for online training in the YouTube format[10]. Similar programs are at the fitness clubs World Class, SM Stretching and others. Large manufacturers of sportswear, such as Adidas, Nike, have also launched online fitness classes. A large number of fitness video lessons are available free of charge for quarantine events on Russian online television Okko.

DISCUSSION

At the moment, the entire world sports industry has "stopped." Thus, the structural scheme of the functioning of all world sport, which has developed over the years, is being violated. And the longer the restrictions last, the more difficult it will be to restore the system. Each sport has years of competition calendars and training schedules. Since many sports have seasonal features, the progress of the competition is possible either for a short period or for a whole cycle for a year.

To date, all summer sports have already fallen into the risk category. However, there is also a larger four-year cycle of sports events tied to the Olympics, from which everything is built up and the shift of any tournament by one year will make serious adjustments for the next years. Each leap year there is a summer Olympic Games, which is the main start of the four-year period, and accordingly for 3 years various continental and world championships are distributed between the Olympic Games, the fate of which is now in question. All continental championships and the Olympics planned for 2020 have been moved forward a year, which immediately raises a number of questions about what will happen to the major tournaments planned in 2021 and beyond, since it is impossible to hold tournaments in one season at once in two years. Thus, it can be assumed that with the long-term global restrictions associated with the pandemic, some of the tournaments will simply be canceled, which will be a serious blow to both the financial and ethical aspects of the sport. All sporting events have their so-called "rank," and each competition, depending on their level, is a developmental stage for athletes personally and for teams in general. Separately, it is worth noting that competitions have age restrictions for participants, various championships among juniors and youths. At this age, every start is worth its weight in gold for the development of an athlete. At the moment, many continental and world championships among juniors and youths have already been canceled (postponed indefinitely). Most likely, they can be canceled and a whole generation of young athletes will be left without the most important stage of sports development. In such a situation, it will become especially important to develop measures to support young athletes, preserve motivation to continue their sports career.

At present, cases of the disease have been recorded in more than two hundred countries of the world, the isolation regime has covered about four billion people on the planet, the vast majority of sporting events have been stopped and measures aimed at combating the spread of COVID-19 are only being tightened. The global sports industry will have to go through a difficult path of "isolation" and further recovery. The further impact of the COVID-19 epidemic on athletic life and communication in sports has yet to be evaluated.

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AUTHOR CONTRIBUTIONS

KG: idea and designing. VZ: data analysis. OC: literature overview. VG: sport analysis. VR: analysis of online sports. All authors contributed to the article and approved the submitted version.

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An Analysis of Broadcasting Media Using Social Media Engagement in the WNBA

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While there has been research into what teams, leagues, and athletes post on social media and the impact of post content on social media engagement, there is limited understanding and empirical research on the impact of broadcasting media on social sport consumption. There are an increasing number of new media through which sport leagues can distribute their content to fans. This research examines the impact of different broadcast platforms on game day engagement with WNBA team Twitter accounts. Using data for the 2016–2018 seasons, results indicate athlete/team quality and performance were positively associated with post engagement, underscoring the importance of the core sport product and potentially indicating that the WNBA is developing a star-driven culture similar to the NBA. In addition, broadcasting on League Pass or local TV (for home teams) and Twitter were associated with lower post engagement suggesting we have more to learn about maximizing online engagement.

Keywords: social media, broadcast, new media platforms, WNBA, engagement

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INTRODUCTION

Broadcast media has held a central role in the "nationalization" of sports or the transition of sports from a pastime to a commercial enterprise (McChesney, 1989). Historically, due to their reliance on ticket sale revenue, professional sport entities, such as baseball owners, were reluctant to embrace broadcasting of games in fear that providing free game coverage would reduce game attendance. However, these fears were misguided; rather, broadcasting revenue proved to be the greatest revenue source for professional sport organizations, with today's media deals earning professional sport leagues hundreds of millions and even billions of dollars (Pedersen, 2017). The importance of broadcast media in the sport industry should not be understated; in modern sport, "attracting spectators and media sponsorships becomes more important than the playing process because sport is now driven by profit and the market" (Frey and Eitzen, 1991, p. 508). Effectively, broadcasting has fundamentally altered and shaped the sport industry, such as determining how North American professional sports are organized, produced, and consumed (Pedersen, 2017). However, increases in cord cutting behaviors as well as alternative media distribution channels have altered the broadcast industry while providing consumers and sport leagues with access to more media options than ever before.

Recently, traditional linear television broadcasting has been challenged by the rise of *cord cutting* or the trend of canceling cable television subscriptions or landline phone connections in favor of Internet-based or wireless services. For example, in 2018, in the USA, pay television providers lost 2.9 million subscribers (Watson, 2019). Globally, this trend is remarkably consistent, with the cord

cutting phenomenon reported in Asia and Europe as well (Nissen, 2016). Overall, there is a shift in viewership recently away from traditional platforms onto digital ones, a transition that is being driven "by standalone streaming services, linear over-the-top (OTT) providers, and companies like Amazon, Facebook, and Twitter, which are bidding for sports streaming rights" (Verna, 2019, n.p.). The shift to digital streaming can come in many forms: traditional television channels streaming their content directly to fans (e.g., ESPN through Disney+), owned OTT services (e.g., The Olympic Channel), league-owned apps (e.g., NFL Game Pass), dedicated streaming companies (e.g., DAZN), and social media platforms (e.g., MLB games broadcast on Facebook). Overall, this trend is challenging existing broadcasting norms, while providing professional sport leagues and organizations with more platforms than ever through which to monetize and distribute their content.

Many professional leagues, particularly non-traditional leagues, are leveraging non-linear and OTT services to effectively distribute their content and expand their audience. One league taking advantage of the increase in broadcasting options is the WNBA. Currently, the WNBA broadcasts games on ESPN2, ESPN3, NBATV, local TV, WNBA League Pass, and Twitter. Twitter has been a broadcast partner of the WNBA since the 2017 season when the league struck a 3-year deal with Twitter to broadcast 20 league games per season (Casey, 2017). The partnership between Twitter and the WNBA was renewed in 2020 with Twitter broadcasting 10 season games (Voepel, 2020). Despite the acceptance of OTT and non-traditional broadcasting channels by various sport leagues, it is currently unclear how these different broadcasting platforms impact sport consumer behavior. For instance, social media platforms were not originally designed to stream content, which may result in consumers being skeptical about embracing them as a sport media distribution channel, or, since sport consumers are motivated to use social media, such as Facebook and Twitter, for interactivity, information gathering, entertainment, fandom, and camaraderie (Filo et al., 2015), they may be an ideal fit for streaming as consumers already feel they are a source of entertainment. Alternatively, social media may not be an appropriate streaming option as consumers would rather use social media to engage and interact with content, rather than stream long-form content such as live games. Consequently, it is important to understand how different broadcasting options impact sport consumer behavior, such as social media engagement.

This research conducts an evaluation of broadcasting options by comparing social media engagement relative to the WNBA's multiple broadcast platforms. Since sport viewing has evolved into a two-way, interactive experience, engagement on social media represents an important metric to consider when evaluating broadcasting media. Online engagement is important to analyze the impacts of online and offline behavioral intentions toward a sport team (Santos et al., 2019) and brand value (Calder et al., 2018). Moreover, not only can online engagement serve as an indication of viewership but it can also spur additional viewership as non-viewers opt to tune in based on the online interactions and conversations they observe (Min et al., 2015). In addition, online engagement can further the viewing experience, such as by providing geographically diverse fans with interaction opportunities otherwise unavailable. Thus, it is important for sport leagues to understand how different broadcasting platforms correlate with online engagement, so they can make informed decisions about broadcasting medium in an increasingly saturated market. Therefore, this research analyzes the impacts of different broadcast media on game day social media engagement with WNBA team accounts during the 2016–2018 seasons.

LITERATURE REVIEW

Sport Broadcasting

Broadcasting holds an important role in the sport industry, in a large degree shaping the structure and organization of professional sport leagues in the USA. The existing broadcasting model results in broadcasting networks bidding on the rights to distribute content, such as sport programming (Evens et al., 2013). Thus, it is now commonplace for North American professional sport leagues' television rights to result in multimillion and even billion-dollar contracts with broadcasters. Since 1970, the NFL has seen a 10,000% increase in their television rights fees, while the NBA doubled their revenue for television rights since 1994 (Pedersen, 2017). Consequently, broadcasting deals are important for sport leagues as a revenue source as well as a way to distribute their content to a wide audience. However, the era of digital broadcasting has significantly disrupted the industry (Turner, 2007).

Advancements in technology have altered the relationship between sport organizations and broadcasters (Evens and Lefever, 2011), such as by increasing the number of broadcasting platforms available to sport leagues (Turner, 2007). For instance, there are a number of new distribution options available including traditional television channels streaming their content directly to fans through owned OTT services, league owned apps, dedicated streaming companies, and social media platforms. While disrupting the sport broadcasting industry, the introduction of new media options has increased the complexity of the sport media market and evolved sport teams and leagues into media entities (Evens and Lefever, 2011). There are two important implications of having more distribution options: (i) more choice for consumers and leagues and (ii) shifting sport viewing to a two-way, interactive experience.

First, emergent technologies, such as digital streaming, provide more choice to consumers and leagues (Turner, 2007); consumers have more content and more choice in how they access their content, while sport leagues have more options and control in how they distribute their content and can reach a wider audience (Fortunato, 2018). Consumers can now access content that would have been previously unavailable to them, such as subscribing to an MLB streaming bundle to access games, rather than being restricted by the broadcasting schedule of their local sports network. Additionally, as lawsuits are settled pertaining to sport media, additional purchase options are available to consumers, such as single-team options for digital media packages accessed via the Internet (Fortunato, 2018). This can result in alternative distribution channels that make

content more affordable and accessible. For example, according to market research firms, the majority of cable replacement plans cost less than half of the average television bill (Willcox, 2019). Additionally, the WNBA and Twitter partnership provides free access to WNBA games for Twitter users through live streams, a partnership designed in part to increase accessibility of WNBA games (Casey, 2017). Hence, consumers have more access to content, and more choice in how they consume their content. Similarly, sport leagues have more broadcasting platforms available to them, allowing them to leverage numerous different media to reach more consumers and maximize their profits (Turner, 2007; Fortunato, 2018). This is of particular importance for smaller, less traditional leagues, such as the WNBA, which might have been traditionally limited by big broadcasters with respect to their product distribution; for example, compared with the NBA, the WNBA receives substantially less (or even no) coverage on major broadcast channels (Cooky et al., 2015). Effectively, an increase in potential broadcasting platforms provides sport leagues with more options through which to distribute their content and maximize their revenues.

Second, advancements in technology, in large part facilitated through the development of Web 2.0 technologies, have shifted the sport viewing experience from a unidirectional, static model to a two-way, interactive process (Pedersen, 2017). Sport consumers are now able to engage and interact with sport entities, including professional sport leagues, athletes, and broadcast personalities, rather than solely consume predeveloped content. This allows athletes and teams to directly communicate with their fans, rather than rely on broadcast media to facilitate their opportunities. Consequently, social media empowers athletes and allows them to develop and monetize their personal brands (Su et al., 2020), challenging the existing power structure that favored broadcasters and leagues. Similarly, new media options have forced sport teams to progress into their own media entities and provide innovative viewing experiences for fans that are more personalized and interactive (Evens and Lefever, 2011). Moreover, consumer engagement and interaction online has become an increasingly important component of the sport consumption experience as it positively influences both online and offline behavioral intentions toward a sports team (Santos et al., 2019) as well as brand value (Calder et al., 2018). Effectively, advancements in technology, particularly social media, are providing sport leagues with additional broadcasting channels as well as facilitating more interactive viewing experiences.

Social Media

Since its introduction, social media has fundamentally altered consumer behavior and the sport industry as sport organizations, teams, leagues, and athletes have access to consumers on two-way channels, as opposed to the more traditional one-way media and advertising platforms (Achen et al., 2017). A defining characteristic of social media is the ability for users to engage with and create content. Traditional media, such as television broadcasts or newspapers, were unidirectional, with a consumer only able to read or consume content. Social media challenged this model, providing two-way, interactive communication where users could engage with (i.e., like, comment, share) and create content. It is beneficial for sport leagues to encourage fan engagement as it represents an opportunity to create a connection through unique synergies and to increase positive behaviors toward the organization (Dick and Basu, 1994; Oliver, 1999). Furthermore, professional sport organizations should increasingly focus on creating dynamic social media content and communication strategies (e.g., relevant information, improved design, and entertainment possibilities) to drive traffic and maintain a strong interactive relationship with fans (Ahn et al., 2014). In the broadcasting sphere, media providers can leverage social media to influence audience tune-in, increasing viewership numbers and advertising revenues (Min et al., 2015). Due to its role in altering consumption behavior, social media has received attention in sport management scholarship.

The diversified roles of social media in sport have been an increasingly researched topic (Filo et al., 2015), with much of this research focusing on Twitter and how individuals (e.g., fans, coaches, players, journalists, and sport media professionals) use the platform. Researchers have investigated the use of Twitter by athletes (Pegoraro, 2010), sports journalists (Sheffer and Schultz, 2010), broadcasters (Hull, 2017), and fans (Brown and Billings, 2013; Clavio and Walsh, 2014). From the sport entity's perspective, research has often acknowledged the role of social media in relationship marketing, such as discussing how it can foster relationships between consumers and sport organizations and athletes (Fisher, 2008; Abeza et al., 2013; Doyle et al., 2020). Thus, the discussion surrounding online engagement and sport entities is often focused on examining strategies, such as how different types of content are related to fans' online behaviors (e.g., liking, commenting on, or sharing a post) (e.g., Wallace et al., 2011; Anagnostopoulos et al., 2018). When considering fans, researchers have investigated areas related to explaining fan behaviors such as the motivations of sport audiences (Frederick et al., 2012) and drivers of online engagement, such as determinants of followership (e.g., team performance) (Pérez, 2013; Watanabe et al., 2015, 2016) and posting behavior (e.g., excitement levels of the game) (Lee et al., 2014). Moreover, research considering media consumption through Twitter (Lee et al., 2014) found that "Twitter works well as a complementary medium for athletes and fans—one that can enhance the experience of sport" (Kassing and Sanderson, 2010, p. 124). As such, it is important to consider social media in tandem with the broadcasting medium as it impacts the sport consumption experience.

Existing scholarship indicates that social media is often used in tandem with other media consumption including fantasy sport (Larkin and Fink, 2016; Weiner and Dwyer, 2017), Internet streaming (Collins et al., 2016), and television viewing (Gibbs et al., 2014), as well as during live games (Uhrich, 2014). Results from such scholarship indicate that social media complements or enhances the consumption experience, rather than replaces other forms of media consumption (Kassing and Sanderson, 2010). This often results in consumers using social media on a second screen, while watching their sport activity. Existing literature has found that the majority of sport consumers (77%) embrace a second screen to access social media (Cunningham and Eastin, 2017), often motivated by

excitement, information, and convenience (Hwang and Lim, 2015). Moreover, as sport consumers become more excited during a game, they become more engaged on Twitter, increasing their exchange of information and opinions (Lee et al., 2014). For instance, fans bask in reflected glory (BIRG) on Twitter when their team is performing well, essentially using Twitter as an identity expression and management tool (Fan et al., 2020). Collectively, the use of social media in tandem to the viewing experience underscores the importance for sport leagues considering social media engagement relative to the broadcasting medium.

Existing scholarship has investigated social media engagement and online consumer behavior, identifying various factors that impact online behavior including post content and game characteristics. For instance, post engagement (i.e., liking, sharing, and commenting on posts) is conditional upon post content with social media users engaging with posts featuring product-related content (i.e., content containing components integral to product performance expected by the consumer such as management, head coach, star player, or team success; Keller, 1993; Gladden and Funk, 2002) more than posts containing non-product related content (Wallace et al., 2011). Similarly, for athletes, posts featuring content related to athletic performance were positively related to post engagement rates (Doyle et al., 2020). Online engagement is also tied to game characteristics such as team performance. For example, Twitter posting behavior is conditional upon game activity with fans BIRGing when their team is winning, and cutting off reflected failure (CORFing) when their team was not performing well (Fan et al., 2020). Moreover, the online behavior of followership (i.e., choosing to follow an account) on Twitter was positively impacted by team performance (Pérez, 2013; Watanabe et al., 2015, 2016). Finally, existing scholarship indicates that televising a game nationally positively impacts Twitter followership, namely the change in followers in a 24-h period (Watanabe et al., 2015). This raises the question of whether broadcasting media impact online engagement, such as national or more traditional broadcast avenues inciting engagement.

Effectively, existing scholarship often focuses on online engagement in isolation, such as the content strategies sport organizations can use to increase engagement with their posts (e.g., Wallace et al., 2011; Anagnostopoulos et al., 2018) or what factors drive consumers to engage online (e.g., follow a team's Twitter account) (e.g., Pérez, 2013; Watanabe et al., 2015, 2016). In doing so, it omits the reality that online engagement is part of an ongoing fan experience ripe with other elements, such as a second-screen viewing while watching a game on television, and its potential to be used as a metric to evaluate viewing experiences. Consequently, this scholarship uses online engagement (i.e., the number of likes, comments, or shares a post by an official WNBA account receives) as a way to evaluate different broadcasting platforms. It is an important metric to consider as online engagement impacts online and offline behavioral intentions toward a sport team (Santos et al., 2019), brand value (Calder et al., 2018), and viewership and audience tune-in (Min et al., 2015). Moreover, it is appropriate to consider as social media platforms, particularly Twitter, are complementary media that enhances the sport experience (Kassing and Sanderson, 2010).

Overall, advancements in technology and consumer preferences for cord cutting and OTT media consumption have resulted in an increasing number of media channels. This includes new features on existing social media platforms that were originally designed to facilitate the development and distribution of user generated content. Despite the importance of understanding it, it is unclear how different broadcast media will impact online engagement. This is of the utmost importance as sport leagues seek to negotiate new media rights deals in an increasingly saturated broadcasting market. Therefore, this research seeks to analyze the impact of the broadcasting medium on game day social media engagements with official WNBA team accounts. In turn, answering the following research question:

How does social media engagement differ across various broadcast media?

METHOD

Sample and Data Collection

Since the WNBA has taken advantage of the shifts in consumer media behavior by embracing numerous broadcast media, it is an appropriate research context. For example, the WNBA has embraced Twitter, with a correlation between team profitability and frequency of tweeting leading to the suggestion that teams should embrace Twitter and use it to update followers in-game (Shreffler et al., 2015). Moreover, the WNBA has been effective in their use of social media, such as the 2020 draft having 1.3 million minutes watched on WNBA and NBA social media accounts (Goldman and Hedlund, 2020). Additionally, as previously mentioned, the WNBA leverages numerous different broadcasting options including Twitter. Collectively, this makes the WNBA an appropriate context to leverage in the examination of broadcasting platforms. However, despite the WNBA effectively leveraging various platforms to reach their consumers, mainstream media has been less inclusive of WNBA content. For example, a review of NBA and WNBA coverage revealed that the WNBA does not receive lavish coverage while in-season, nor any off-season coverage (Cooky et al., 2015). Consequently, it is important to note that while the WNBA serves as an appropriate context for this study due to its effective embracement of Twitter and varied broadcasting platforms, the results are likely context specific, or at least most generalizable to non-traditional sports or women's sports that receive less media coverage and conversely rely on more "non-traditional" broadcasting models.

The 2016–2018 WNBA regular seasons were considered, with games serving as the unit of analysis (102 games total; 34 per season). CrowdTangle was used to obtain the interactions, defined as the number of Likes, Comments, and Retweets, of each Twitter post made by each WNBA team account on each game day. This is consistent with prior scholarship that often uses metrics such as likes, comments, and shares to capture users' engagements (Wallace et al., 2011; Cvijikj and Michahelles, 2013; Doyle et al., 2020). The 2016 season was selected as

the first season as it was 1 year prior to the introduction of Twitter broadcasts and as such could provide a baseline for online engagement. The 2018 season was selected as the final season under consideration because it (i) included two seasons of Twitter broadcasts to allow consumers to adjust and embrace the broadcast medium and (ii) CrowdTangle ceased reporting on Twitter data after 2018. Since post frequency varied across teams, interactions per Twitter post were computed to compare all teams equally. Specifically, three dependent variables were computed for each game: interactions per home team post, interactions per away team post, and for both teams in each game, the average game interactions per post.

Twitter was selected as the focal, and sole platform, for three primary reasons. First, the popularity and adoption of Twitter among the sport industry and fans makes it an appropriate platform. At the time of the study, unlike other platforms, all the WNBA teams had and fully embraced Twitter accounts, allowing for engagement to be measured for all teams. Moreover, Twitter is incredibly popular among sport fans and within sport management scholarship. Specifically, Twitter is among the most popular platforms used by fans to access sport media (Billings et al., 2017) and as such as received the majority of attention in sport management social media scholarship (Abeza et al., 2015). Second, compared with other social media platforms, Twitter has a unique role of providing information and live game updates; for example, while Facebook has been likened to a team's website, Twitter is used more frequently to share news with fans (Gibbs et al., 2014). Moreover, prior scholarship has found that WNBA teams should use Twitter to provide in-game updates as well as foster relationships with their fan-base (Shreffler et al., 2015). As such, its role in game-day consumption makes Twitter an appropriate platform to use as an insight into online engagement on game days. Finally, throughout the 2016–2018 seasons, Twitter was a first mover with respect to entering the live sport broadcasting space. As such, compared with other social media platforms, Twitter is unique in its role as both a broadcaster and a social media platform throughout the WNBA 2016–2018 seasons. As such, Twitter was selected as the focal social media platform for this research.

Since this study sought to examine the impact of the broadcast medium on social media interactions, the medium(s) of each game were coded. Using the WNBA website, the medium for each game was coded as ESPN2, ESPN3, NBATV, Local TV, WNBA League Pass, or Twitter, with the potential for a game to receive multiple codes if it was broadcasted across multiple media. Since social media behavior during a game is in part a function of team popularity and quality, various control variables were considered including win percentage, championship team, and number of MVPs and all-star players on the team. Basketball reference was used to capture the win percentage of home and away teams and the count of the number of MVPs and all-star players on the home and away teams. Furthermore, market characteristics could impact the amount of social media engagements. Thus, the county populations as per the Census Bureau were included and indicator variables were added to capture if the home team had moved to a different arena that season or was in a new market (i.e., Dallas Wings in 2016 and Las Vegas Aces in 2018).

Model and Analysis

To determine the effect of the broadcast medium on social media engagement, an ordinary least squares regression with year-fixed effects was used to estimate the panel data. This is the typical statistical method for estimating the effect of various independent variables on a single dependent variable (Watanabe et al., 2015). Specifically, we estimated $y_{ijt} = \beta 1 X_{ijt} + \upsilon_t + \varepsilon_{ijt}$ where y_{ij} was the number of interactions per post for team i in game j (tested for three dependent variables: average game interactions per post, interactions per home team post, and interactions per away team post), X_{ijt} includes measures of team quality, market characteristics, and broadcast platform variables as described above, υ_i are year fixed effects, and ε_{ijt} is a standard error term with a mean of zero. The results for testing the three models each with their separate dependent variable are presented below.

RESULTS

The descriptive statistics in **Table 1** indicate that WNBA game day Twitter posts received a wide range of social media interactions from 4.72 to over 400 per post, although the majority of posts received < 100 interactions. The majority of games were on League Pass or local television with < 7% of games broadcast on ESPN2, ESPN3, and Twitter.

For all three models, game day WNBA social media posts saw an increase in interactions over the 2016–2018 seasons, with the sharpest increase in interactions on ESPN2. In 2018, the ten games with the most interactions on ESPN2 featured six games with the previous season champion Minnesota Lynx and home teams with high numbers of all-star players like the Phoenix Mercury, Seattle Storm, and Los Angeles Sparks (**Figure 1**).

A Breusch-Pagan test for heteroskedasticity indicated the need for robust standard errors in all three models ($p < 0.001$). Variance inflation factors for all three models showed no concerns with multicollinearity (VIF < 2.0). As expected, control variables pertaining to team quality influenced social media engagements (**Table 2**). Specifically, being the league champion the previous season ($p < 0.001$), the number of all-star players ($p < 0.05$), and the presence of an MVP ($p < 0.001$) were all associated with higher interactions for home team posts, away team posts, and the average of both (i.e., in all three models). Results also consistently showed across all three models that social media interactions for the 2016 and 2017 seasons were lower than the 2018 reference season ($p < 0.001$), indicating an increase in social media engagement over the sample years. A new team in a market was associated with more interactions for home games (model 2) but not when the team plays on the road (model 3).

A higher home team winning percentage was associated with lower interactions on the home team posts ($p < 0.05$), all else equal. Similarly, higher away team winning percentages were associated with lower interactions per away team post ($p < 0.01$), all else equal. There are a few explanations for this seemingly contradictory result. First, there is a correlation between win percentage, championships, star players, and MVPs. In this context, when dummies for championships and stars are

TABLE 1 | Descriptive statistics.

Variable	Mean	Std. Dev.	Min	Max
Average game interactions per post	45.02	31.06	7.09	247.04
Interactions per home team post	48.65	44.51	4.72	405.94
Interactions per away team post	41.27	37.00	2.89	331.11
Win percentage home team	0.497	0.234	0	1
Win percentage away team	0.504	0.234	0	1
Champ last season (home team)	0.08	0.27	0	1
Champ last season (away team)	0.09	0.28	0	1
All-star players (total of home and away)	1.67	1.17	0	5
All-star players home	0.83	0.87	0	3
All-star players away	0.84	0.87	0	3
MVP total (total of home and away)	0.17	0.37	0	1
MVP home team	0.08	0.27	0	1
MVP away team	0.09	0.28	0	1
First season in new market	0.06	0.23	0	1
New arena	0.22	0.41	0	1
Population county	3,069,594	2,758,606	269,033	10,200,000
ESPN2	0.07	0.25	0	1
ESPN3	0.07	0.25	0	1
NBATV	0.24	0.43	0	1
Twitter	0.06	0.24	0	1
League Pass/local TV	0.87	0.34	0	1

held constant, winning percent is related to lower social media interactions, but when accounting for the full set of team quality variables, winning percent simply adjusts the overall measure of interactions to be more precise. Alternatively, the first few games of the season include teams with win percentages of zero (e.g., the team lost their first game) and with a short WNBA season, this might skew the parameter.

When looking at the broadcast medium, broadcasting the game on League Pass and local television ($p = 0.0021$) is associated with lower social media interactions, but only for home team posts (Model 2). This might be explained by a team's most ardent (and social media engaged fans) being engaged at the game or at watch parties and thus tweeting less. It could also reflect that League Pass blacks out any local game that is already being broadcast on ESPN or ABC. League Pass viewers can watch these games after the live broadcast which could result in a smaller audience that is able to watch, and thus interact, on game day. Finally, in considering the recent innovation of broadcasting WNBA games on Twitter, the results show there is a decrease in home team social media interactions for games broadcasted on Twitter ($p = 0.0683$).

DISCUSSION AND IMPLICATIONS

Between 2016 and 2018, the WNBA team Twitter accounts saw an increase in post engagement indicative of a greater demand for the WNBA. Given the importance of online consumer engagement via its impact on online and offline behavioral intentions toward a sport team (Santos et al., 2019), on brand value (Calder et al., 2018), and on increasing viewership and audience tune-in (Min et al., 2015), we sought to more clearly understand what factors impact game day engagement with official team Twitter accounts, with a particular emphasis on the impact of the broadcasting medium. As per our results, there are two notable sets of drivers of Twitter engagement with official WNBA team accounts on game days: (i) team/athlete quality and performance and (ii) broadcasting medium.

First, our results indicate that several measures of team quality were significantly associated with social media post engagements, namely the presence of an MVP player, the number of all-star players on a team, and being the league champion the previous season. The positive impact of team performance on post engagements aligns with prior scholarship indicating that Twitter followership is positively impacted by team performance (Pérez, 2013; Watanabe et al., 2015, 2016). The positive relationship between engagement and team performance also aligns with existing scholarship that has found consumers becoming increasingly engaged online as they become more excited during a game (Lee et al., 2014), including using social media as an identity expression and management tool (Fan et al., 2020). Moreover, the impact of star player on post engagement is consistent with previous research on demand in social media following (Watanabe et al., 2017). Overall, fans react more to star players than winning, a result which runs counter to attendance demand (Berri et al., 2004). This suggests that social media post engagement has different antecedents than in-person attendance and that perhaps the WNBA is developing a star-driven fan culture similar to the NBA (Jane, 2016).

In doing so, this research contributes to our theoretical knowledge with respect to the value of star players and team

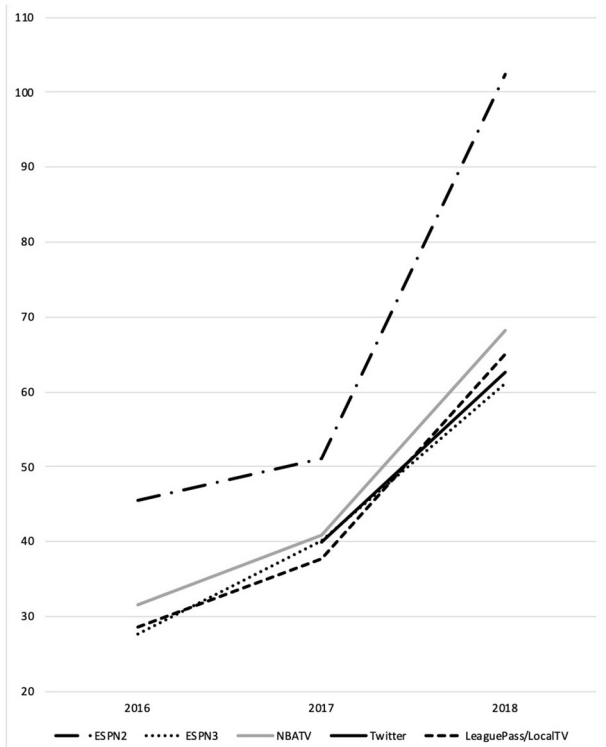

FIGURE 1 | Average of home and away team interactions per Twitter post, WNBA 2016–2018.

TABLE 2 | Effect of broadcast type and team quality on interactions per Twitter post.

Variable	Model 1 Average game interactions per post	Model 2 Interactions per home team post	Model 3 Interactions per away team post
Win percentage home team	−5.72	−12.70*	−5.13
Win percentage away team	−12.04**	−1.23	−17.11**
Champ last season (home team)	32.82***	58.58***	5.11
Champ last season (away team)	25.70***	4.71	52.25***
All-star players (total home and away)	1.98*		
All-star players home		6.25***	0.40
All-star players away		−2.06	4.26*
MVP total (total of home and away)	17.37***		
MVP home team		36.75***	6.39
MVP away team		−0.48	29.23***
First season in new market	11.04*	31.23***	−2.15
New arena	4.78	5.95	1.47
Population county	0.00	0.00	0.00
ESPN2	0.43	−2.70	−1.99
ESPN3	−0.16	−5.94	7.27
NBATV	1.00	−0.81	2.69
Twitter	−2.50	−11.47#	6.54
League Pass/local TV	−6.99	−17.14**	2.63
2016	−36.47***	−38.53***	−31.47***
2017	−26.68***	−26.44***	−21.97***
Constant	67.01***	76.77***	54.15***
N	590	590	590
R^2	0.447	0.382	0.330

#$p < 0.07$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

success with respect to online engagement by considering a different context. While prior scholarship has considered various sport contexts, such as professional soccer leagues (Pérez, 2013) and the MLB (Watanabe et al., 2015, 2016, 2017), this research considered the WNBA which is unique as it is a women's league and deemed a "untraditional league." The alignment between prior scholarship and our results suggests a commonality with respect to drivers of online engagement across sport contexts and men's and women's sport at least at the professional level. Practically, the importance of these drivers underscores the importance of sport teams and leagues prioritizing the quality of their product and their star players as these factors are tied to social media engagement. It also suggests that leagues and teams can share best practices with respect to social media strategies as there is evidence of core elements that drive engagement, such as star players and team performance, across sport teams and genders at the professional level. For instance, the importance of star players and team performance with respect to online engagement for the WNBA is consistent with that of the NBA, suggesting that the WNBA can look to the NBA for advice and best practices with respect to social media strategies.

Second, this research explores the impact of the broadcasting medium on Twitter post engagement rates. Second screens are undeniably a vital platform for fans to communicate (Cunningham and Eastin, 2017), especially as games become more exciting (Lee et al., 2014). Yet, the results suggest that despite increased second screen interaction during traditional broadcasts (Voorveld and Viswanathan, 2015; Smith et al., 2019), when a WNBA game was broadcast on League Pass or local TV, there were less engagements with home team posts. This could be because home team fans are at the game, thus tweeting less (Smith et al., 2019), at watch parties or local bars viewing with their friends, thus not needing social media for identity expression and management purposes, or because there are times when League Pass locally blacks out a game, thus reducing the number of home team fans who can engage with their local team posts.

Practically, this lends additional evidence to the notion that leagues' broadcasting rules may be punitive to fans. Often leagues embrace policies designed to maximize broadcasting revenue for their teams, at times at the fans' expense (Fortunato, 2018). This research suggests that broadcasting avenues or rules, such as broadcasting home games on League Pass, may negatively impact online engagement, an important component of the fan experience and one that has important managerial implications (e.g., impacts sport teams' brand value; Calder et al., 2018). Therefore, this research highlights the complexities of broadcasting decisions in the digital era, while suggesting that sport leagues consider online engagement in the broadcasting

decision making process as it is an important element of media consumption.

We also found from our results that when a game is broadcast on Twitter, posts on WNBA team accounts receive less engagement than when the game is broadcast on other platforms (i.e., ESPN2, ESPN3, NBATV, or League Pass/local TV). This intriguing result could be explained by users adapting to new methods of broadcasting or that it is difficult for fans to multitask and navigate watching and tweeting on the same platform. Alternatively, this result could be explained by Twitter providing viewing access to individuals who otherwise would have been reliant on Twitter for game updates as they had no broadcast option available to them. Social media is frequently used as a source of information (Filo et al., 2015), with fans engaging online to exchange information and opinions (Lee et al., 2014). Consequently, fans who are unable to view a game through its broadcast channel (e.g., do not have cable or away from a TV such as commuting during a game), may have previously relied on game updates through social media. Hence, when Twitter broadcasts the game, it may provide such fans with a viewing option, eliminating their need to check Twitter for updates, in turn limiting their post engagements. Practically, this suggests that the introduction of new broadcasting media disrupts the existing broadcasting model and impacts fans' experiences, such as their online engagement on game days. The WNBA, and other sport leagues, should be cognizant that not all new media distribution options will be comparable with more "traditional" broadcasting options and that should be accounted for in their decision-making processes.

Regardless of the reason why, our results indicate lower social media engagement rates for official WNBA team game day posts when the game is broadcast on League Pass or local TV (for home teams) and on Twitter. However, this is not to mean that national broadcast media, such as NBATV, ESPN2, or ESPN3, indicate higher levels of online engagement; with these broadcast types not being significantly associated with online engagement. This suggests that there may be a "standard" engagement level on game days that is only impacted by market disruptors (i.e., Twitter providing access to games free to users who may not have otherwise been able to watch a game). This also suggests that if a WNBA team seeks to increase online engagement, it might require a significant disruption to the existing broadcasting structure (i.e., changing league schedules, prioritizing female content, etc.). Overall, since social media engagement can positively influence online and offline behavioral intentions toward a sport team (Santos et al., 2019) as well as positively influence viewership and audience tune-in (Min et al., 2015) and brand value (Calder et al., 2018), it is important for sport leagues to consider team performance factors as well as the broadcasting medium.

LIMITATIONS AND FUTURE DIRECTIONS

This research examined factors associated with official WNBA team's game day social media posts, with a particular emphasis on understanding the influence of the broadcast medium. Though valuable and informative, our insights are limited by the highly dynamic nature of social media platforms. Additional years of data would help us better understand whether post engagement continues to remain lower when the game is streamed on Twitter relative to other broadcasting options. Twitter was the sole social media platform considered in this research not only in part due to its popularity and role as an information source for games and news updates but also because it was the sole social media platform that broadcast live games through the 2016–2018 WNBA season. Though Twitter was an appropriate platform to focus on, results could be limited by only measuring online engagement on one platform. Since platforms are unique and serve different purposes for consumers (e.g., Facebook as a team website and Twitter as a timely, information source for game updates; Gibbs et al., 2014), it is unlikely that the results would be consistent across platforms and as such it would be interesting to compare and consider online engagement across multiple platforms relative to broadcast media. Moreover, additional social media platforms (e.g., Facebook Live) and other "unconventional" OTT services (e.g., Amazon Prime) are increasingly moving into the live (sport) broadcasting sphere. As such, future research should continue this investigation by considering other platforms/streaming options and online engagement. Moreover, there could be a comparison between sports, such as the WNBA (streaming on Twitter) and the NFL (streaming on Amazon Prime), as we see new broadcasting deals emerge to understand the intersections between sports, online engagement, and broadcast mediums.

Future scholarship should also consider social media engagement patterns across sport leagues. As a non-traditional professional sport league, the WNBA does not have the same broadcasting rights contracts as more mainstream professional sport leagues in the USA. Consequently, the WNBA might have to leverage unconventional broadcasting channels just to access their fan base and increase their content's reach, resulting in broadcasting rights deals being a necessity to maximize distribution and revenue, rather than a strategic decision based on maximizing engagement. Future research could look to contact Twitter and WNBA team and league executives to better understand the motivating factors behind their partnership. Moreover, future research could also look at the impact of broadcasting medium across different sport leagues, since each league has a unique combination of broadcasting platforms and as such might experience different impacts on online engagement and seek to identify similarities and differences across sport contexts.

Finally, the nature of our social media data only captures a portion of sport consumers' behaviors. It is unclear from our data how or why sport consumers were using social media, how they typically consume WNBA games, or their preferences with respect to the broadcast medium. Future scholarship should consider more in-depth approaches, such as surveys and interviews, to critically examine consumers' opinions and preferences with respect to broadcast options and social media engagement behavior.

CONCLUSION

In conclusion, digital streaming of live sport events holds promise for women's sport and niche sports with limited television contracts or resources to produce their own OTT service. Furthermore, advancements in technology and shifting consumer preferences and behaviors have resulted in a number of new broadcast options through which sport leagues can distribute their content directly to fans. This research sought to examine the impact of the broadcast medium on social media engagement with respect to game day WNBA team account posts. Results indicate that athlete/team quality and performance, namely, the presence of an MVP player, the number of all-star players on a team, and being the league champion the previous season, were positively associated with post engagement. However, broadcasting on League Pass or local TV (for home teams) and Twitter were associated with lower post engagement. Since online engagement is associated with offline and online behavioral intentions toward teams and viewership, these findings have important implications for sport leagues seeking to maximize their online engagement and viewership.

DATA AVAILABILITY STATEMENT

The data analyzed in this study is subject to the following licenses/restrictions: This data set is created from publicly available social media data. Requests to access these datasets should be directed to AP, pegoraro@uoguelph.ca.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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Video Production and Distribution Platform in Swiss Sports Teams: An Analysis of Acceptance and Willingness to Pay

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Swisscom Asport ("Asport") has set itself the target of covering the entire video process from production to distribution. Its services should be affordable not only for professional sports clubs but also for their amateur counterparts. Despite limited resources, clubs want to increase their attractiveness through new technologies and meet members' needs. This paper examines the factors that lead to the acceptance of Asport services by sports clubs. In addition, the willingness to pay for these services is evaluated. Pricing is critical to success in innovation and also because of the limited financial resources of sports clubs. Based on the literature research, a conceptual model was developed based on the unified theory of acceptance and use of technology model (UTAUT), tested using an online survey of Swiss amateur football clubs, and evaluated using regression analysis. The study findings show that social environment exerts the strongest influence on behavioral intention, defined as "acceptance" in this paper. Furthermore, the two independent variables, performance expectancy and effort expectancy, have a significant effect on user acceptance. In contrast to the original model (UTAUT), this paper demonstrates the direct influence of attitude to use. Of the independent variables, facilitating conditions have an additional effect on attitude to use. The results demonstrate that it is not acceptance but attitude to use that influences willingness to pay. An in-depth evaluation of willingness to pay shows that the optimal price point is 83.3% lower than the price offered by the company; however, there are budget-dependent variations in the assessment.

Keywords: video production, distribution platform, sport, acceptance, willingness-to-pay

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INTRODUCTION

Digitalization is fundamentally changing the world and our lives in every respect, whether through the way we interact or the range of new services (Dellea et al., 2014). Changes in the digital world take place many times faster, and much less time passes from introducing new technology to achieving normality (Dellea et al., 2014). Consumer behavior has also adapted accordingly, and customers want access to goods and services anytime and anywhere. This effect is reinforced by the fact that most consumers today are digital natives, i.e., people who have grown up with digital technologies (Dellea et al., 2014). These sweeping changes are also transforming the entire sports

industry including the way sports are played, consumed, and analyzed (Ráthonyi et al., 2018). Often the focus is on technologies that offer new opportunities for various stakeholders such as players, sports clubs, media, or sponsors (Elishkov et al., 2017). To address all these different stakeholders and their needs, a large number of often-young companies compete in the global sports market (Elishkov et al., 2017).

One company that is active in Switzerland and wants to digitize the Swiss sports video world is Swisscom Asport ("Asport"). Their product aims to cover the entire video process, from the production of sporting events to distribution, in a simple and automated way, with the help of the latest technology (Asport, 2020; Swisscom Asport, 2020). Asport wants to offer equal opportunities through affordable technologies and focus not only on professional sports clubs but also on their amateur counterparts (Asport, 2020). Amateur clubs often face various challenges such as recruiting members, finding volunteers, raising funds, and marketing through sponsors (Winand et al., 2016). At the same time, they are concerned with the social changes caused by digitalization and the resulting needs of members who do not want to miss out on the use and possibilities of technology in their sports club (Volkmann et al., 2019). Asport services are designed to assist with these challenges (Asport, 2020). For example, the use of technology can increase the attractiveness of the club, especially for the younger generation (Volkmann et al., 2019). Furthermore, the recording and online publication of matches provides the club with new opportunities to market itself and generate additional revenue (Asport, 2020). For Asport to successfully establish its services on the market in the long term and further optimize them, it is crucial to understand how these products function. This also includes knowledge about the factors that lead to acceptance or rejection by users. These questions are addressed in research on technology acceptance, which is widely covered in the literature (Reichwald, 1982). Another success-critical aspect that mainly determines the profitability of a company is pricing. The basis for this is an understanding of consumer willingness to pay (Völckner, 2006). This knowledge seems even more important for Asport owing to the limited financial resources of amateur sports clubs. After all, price is the determining factor in whether clubs can afford new technology to serve their members (Volkmann et al., 2019).

The aim of this paper is to determine the factors that lead to the acceptance of Asport services and analyze the willingness to pay for Asport. These two topics will be reviewed based on the literature and tested using a quantitative method, based on a survey carried out among Swiss amateur football clubs.

The following research questions can be derived from the objectives:

1. *What factors influence the acceptance of Asport services by amateur sports clubs?*
2. *Is an amateur sports club's willingness to pay influenced by its acceptance of Asport services?*
3. *How high is the willingness to pay for Asport services among sports clubs in the amateur sector?*

While there are existing studies that apply technology adoption in the context of sports technologies (Hur et al., 2011; Kwak and McDaniel, 2011; Ibrahim, 2014; Chien-Ta and Chao-Hsiang, 2015; Byun et al., 2018; Kim and Chiu, 2019), there are none using UTAUT. Moreover, all these studies focus on the individual consumer rather than the sports club. For instance, the study by Kwak and McDaniel (2011) employed the Technology Acceptance Model (TAM; Davis et al., 1989) as a theoretical framework to investigate fantasy sports league consumption. Their findings show that domain-specific knowledge, ease of use, social support and gender positively influence favorable beliefs and behavioral intentions toward a particular technology system, which is in line with previous TAM research (Alshare et al., 2005; Ha et al., 2007; Zhang and Mao, 2008). Factors influencing consumers' intention and actual behavior in using sports brand apps were examined using TAM by Byun et al. (2018). The results indicate that the level of enjoyment had a significant positive influence on perceived ease of use, while perceived ease of use also positively influenced perceived usefulness. In contrast, we focused on club managers instead of individual consumers and used the UTAUT model instead of TAM. While TAM is considered a robust model, it has been criticized for being too parsimonious to explain complex psychological processes such as behavior and technology acceptance (Venkatesh et al., 2003).

Acceptance research is located in social science-related studies, and it investigates the background of user acceptance or rejection of innovations (Reichwald, 1982). The aim is to explore the influence of an innovation's design on the end-user intention to adopt it and explore the interrelation between innovation introduction and its resulting impact (Reichwald, 1982). In the context of business economics, acceptance research is relevant in the development of the organization, the introduction of information systems, and in marketing theory—as well as having a differentiating significance in corresponding areas (Simon, 2001). Organizational theory examines how acceptance by members of an organization changes when decisions are enforced and structures are changed (Mühlen, 1998). In the area of marketing, it examines the acceptance or rejection of new services and products (Kollmann, 1998). Business informatics combines these two approaches because information systems are new products and often result in organizational adjustments when they are introduced (Lucas, 1975).

In applied research, Van Westendorp's price sensitivity measure is often used to test willingness to pay (Roll et al., 2010). For example, the European market research institute, GfK, uses this method to determine critical price points for new products (Breidert et al., 2006). As early as 1976, Van Westendorp noted that price was a relevant factor in research circles, but this was not reflected in the number of techniques used to determine the optimal price. Therefore, he introduced his price sensitivity meter (PSM) method, which belongs to the direct customer survey (Van Westendorp, 1976). The underlying idea is that each product has a specific price-setting range. If it falls below that range, the product is perceived as inferior quality, but when exceeded, the consumer will not purchase it because it represents poor value for money (Diller, 2008). This method aims to determine the optimal

price and an acceptable price range based on four questions (Van Westendorp, 1976).

After introducing a product to potential customers, the following four questions are asked (Van Westendorp, 1976):

- "At which price on this scale are you beginning to experience …… {test-product) as cheap?"
- "At which price on this scale are you beginning to experience …… {test-product) as expensive?"
- "At which price on this scale you are beginning to experience …… {test-product) as too expensive—so that you would never consider buying it yourself?"
- "At which price on this scale you are beginning to experience …… {test-product) as too cheap—so that you say at this price the quality cannot be good?"

The results can be shown in an example diagram, the answers to the individual questions being aggregated and presented accordingly (Wildner, 2003). To determine the acceptable price range, the inverses of the "cheap" and "expensive" curves are formed and renamed "not cheap" and "not expensive" (Reinecke et al., 2009). The intersection of the two "not cheap" and "too cheap" curves is the price lower limit. This makes sense since an additional reduction in price would cause the proportion of those who find the product too cheap to exceed the proportion of those who do not consider it cheap (Reinecke et al., 2009). The price ceiling is determined by the intersection of the "too expensive" and "not expensive" curves and is also described as the point of marginal expensiveness. An increase in the price does not make sense because the proportion of people describing the product as too expensive would exceed those who do not view the product as expensive (Reinecke et al., 2009).

The optimal price point is defined by the intersection of the two curves "too cheap" and "too expensive." At this point, the same number of potential customers think the product is either too cheap or too expensive (Khandker and Joshi, 2019). However, this does not take cost structures into account but instead gives the optimal price from a demand perspective, namely, when customer resistance to purchase is lowest (Lewis and Shoemaker, 1997). The indifference price is formed from the "expensive" and "cheap" curves and means that at this price, an equal number of respondents think that the product is either expensive or cheap (Khandker and Joshi, 2019). According to Van Westendorp (1976), this price usually represents the median price effectively paid by customers (or the price of the market leader). Moreover, the gap between the indifference price and the optimal price shows the price sensitivity of potential customers; the smaller the difference, the more sensitive the price (Reinecke et al., 2009).

According to Reinecke et al. (2009), the Van Westendorp method is especially suitable for estimating the price of innovations for which competitors and price expectations do not yet exist. In particular, the knowledge gained of the acceptable price range provides a valuable contribution to price-setting. Studies have been identified that incorporate a willingness to pay into a technology acceptance model and capture it using the Van Westendorp method. For example, willingness to pay was determined in Saha et al. (2020), using questions to establish whether the subject was willing to pay more in some instances. One statement from the survey read, *"I would continue to buy from this website if its prices increase somewhat"* (Saha et al., 2020). Arogundade et al. (2016) also asked whether or not the respondent was willing to pay more for secure software.

The basis of this work is the UTAUT model by Venkatesh et al. (2003), which is designed to test acceptability. The choice of the model is justified by the fact that it is the amalgamation and further development of various technology acceptance models. At the same time, applicability and generalizability are high and have already been used as a basis in various studies and adapted according to the context (Venkatesh et al., 2012). Determinants with a direct influence on behavioral intention are performance expectancy, effort expectancy, and social influence. Together with facilitating conditions, behavioral intention itself is a determinant with a direct influence on actual system use (Venkatesh et al., 2003). Determinants are moderated by the variables of gender, age, experience, and voluntariness of use (Venkatesh et al., 2003). Based on Venkatesh et al.'s (2003) longitudinal study and interviewing participants at different points in time, from introduction to use over time, the experience variable could be captured.

We chose gender and age as moderators for several reasons. Age was found to be an important moderator of behavioral intention to use information and communication technologies (ICT) in other studies (Venkatesh et al., 2012; Magsamen-Conrad et al., 2015). Despite being the most important predictor across all age groups, the effects of performance expectancy appear to be stronger for younger adults than for older ones (Wang and Wang, 2010; Venkatesh et al., 2012; Cimperman et al., 2016). An opposite pattern was found for the other determinants. For adults above the age of 50, it was mainly effort expectancy, social influence, and enabling conditions that influenced intention to use ICT (Venkatesh and Davis, 2000; Venkatesh et al., 2003; Cimperman et al., 2016).

Besides age, gender is a important demographic variables related to information and communication technology use and has been widely examined (Parameswaran et al., 2015). Prior studies have suggested that gender plays an important role in explaining behavioral intention in information system research (Sun and Zhang, 2006; Tarhini et al., 2014). The study by Venkatesh et al. (2003) shows that performance expectancy is the strongest factor on behavioral intention, and the effect is stronger for men and younger individuals. Further, the influence of effort expectancy is higher for women and older individuals, although it decreases with experience (Venkatesh et al., 2003). The proportion of moderators is so high for social influence that without them the relationship is not significant. In addition, social pressure decreases with experience, and if the system is used voluntarily, it is not relevant (Venkatesh et al., 2003). Facilitating conditions did not have a significant effect on behavioral intention, as this was explained by effort expectancy. However, a significant relationship exists to effective use only through the moderators of age and experience, with

the effect increasing for older individuals and higher experience (Venkatesh et al., 2003).

Although it results from the examination of the eight acceptance models that seven constructs have a significant effect on behavioral intention, only the four presented are represented in the UTAUT (Venkatesh et al., 2003). Although the authors test the two variables, they formulate the hypothesis that computer self-efficacy and computer anxiety do not have a significant influence. The reason for this is a study conducted before that, which shows that the effect is entirely caused by effort expectancy (Venkatesh and Davis, 2000). One construct that has produced mixed results in past studies of technology acceptance is attitude toward use and its significance on behavioral intention. The authors of the UTAUT postulate that attitude only has a significant impact when performance and effort expectancy are not part of the determinants and accordingly exclude the construct from the model (Venkatesh et al., 2003). Empirical validation of the model confirms the assumptions and no significance is found for any of the three themed factors (Venkatesh et al., 2003).

In a meta-analysis by Khechine et al. (2016) comprising 74 publications that applied the UTAUT model, it was confirmed that performance expectancy has the strongest influence on behavioral intention. Further, as in Venkatesh et al. (2003) a significant influence of effort expectancy and social influence on behavioral intention was demonstrated. Unlike in the original model, facilitating conditions have a significant effect on behavioral intention in the study by Khechine et al. (2016) (Venkatesh et al., 2003).

In their study, Dwivedi et al. (2019) revisited the UTAUT based on a combination of a meta-analysis comprising 162 studies and a structural equation model. They were able to demonstrate that there is a direct influence from the independent variables of performance expectancy, effort expectancy, social influence, and facilitating conditions on usage attitudes, with performance expectancy having the strongest effect. Further, a significant and direct relationship was demonstrated from usage attitude to behavioral intention, again in contrast to the original model (Venkatesh et al., 2003; Dwivedi et al., 2019).

The object of this study—Asport—is neither a classic use case in the corporate context, as applied in the UTAUT model, nor in the consumer context, as in the UTAUT 2 model. From the authors' point of view, using the UTAUT as a basis is more logical because sports clubs as organizations bear the cost of the system. Accordingly, the feature of UTAUT 2 in that consumers must pay for their own use and can decide whether to purchase and use the system is no longer applicable (Venkatesh et al., 2012). However, working for an amateur sports club is not comparable to a traditional employment relationship, so use of the system must be considered voluntary. This is comparable with UTAUT 2, so the willingness to use moderator is removed from our model.

Venkatesh et al. (2003) postulated and proved that self-efficacy and anxiety have no significant effect on behavioral intention and were removed as determinants. This was criticized, at least concerning self-efficacy, by Moghavvemi et al. (2013). According to Yuen et al. (2010), users perceive new technologies as complex, and confidence in their own abilities has a relevant influence on acceptance. To address this aspect and to verify the findings of Venkatesh et al. (2003), the two independent variables were included in our model. The same applies to the attitude to use variable. In this paper, and as shown in the conceptual model below, attitude to use is placed between the independent variables and behavioral intention. The aim is to examine both the direct influence of attitude to use on behavioral intention and the effect of the independent variables on attitude to use. This is in line with the meta-analysis by Dwivedi et al. (2019), who demonstrated the direct influences described.

In this paper, unlike in the UTAUT model, actual use is not verified owing to the implementation options. Accordingly, the endpoint of the acceptance process here must be behavioral intention and is equivalent to acceptance. This application fits with the definition of acceptance in this thesis, which states that acceptance occurs when behavioral intention has been formed.

In the UTAUT model, only an influence of the facilitating conditions on actual system use was demonstrated (Venkatesh et al., 2003). Different results were obtained by Khechine et al. (2016), who demonstrated an effect on behavioral intention. In addition, the findings of Dwivedi et al. (2019) show an effect on attitude to use. Based on these findings, the conceptual model examines the relationship between facilitating conditions, attitude to use, and behavioral intention. As mentioned above, the voluntary nature of use was excluded as a moderator. The same is true for experience, as only a single measurement was performed in this study owing to time constraints. Based on the previous discussion, hypotheses are now derived.

In addition to acceptance, willingness to pay is of interest and included in the conceptual model. The literature shows different approaches to this variable in technology acceptance models, and no universal implementation practice exists. Therefore, based on the context of the application, it was decided that willingness to pay should be the study endpoint. It needs to be determined whether attitude to use as well as behavioral intention or acceptance influences willingness to pay. Based on this derivation and the described adjustments, the conceptual model for this paper is shown below (**Figure 1**).

MATERIALS AND METHODOLOGY

Based on Venkatesh et al. (2003), a quantitative survey was conducted. The advantage of this method is that the standardized questionnaire allows a large sample to be collected and the answers to be compared (Böhler, 2004). To obtain the largest possible number of subjects while keeping time and costs low, an online survey was conducted (Hussy et al., 2013). In many previous studies, the technology acceptance models were queried either several times during or after the completion of the acceptance process (Venkatesh et al., 2003). Due to the starting point of this study—namely that Asport only has a few customers who already use the services—the focus was placed on potential customers or users rather than actual users. This means that behavioral intention is the endpoint leading to adoption. In addition, due to the time constraints of this thesis, the survey was conducted once only.

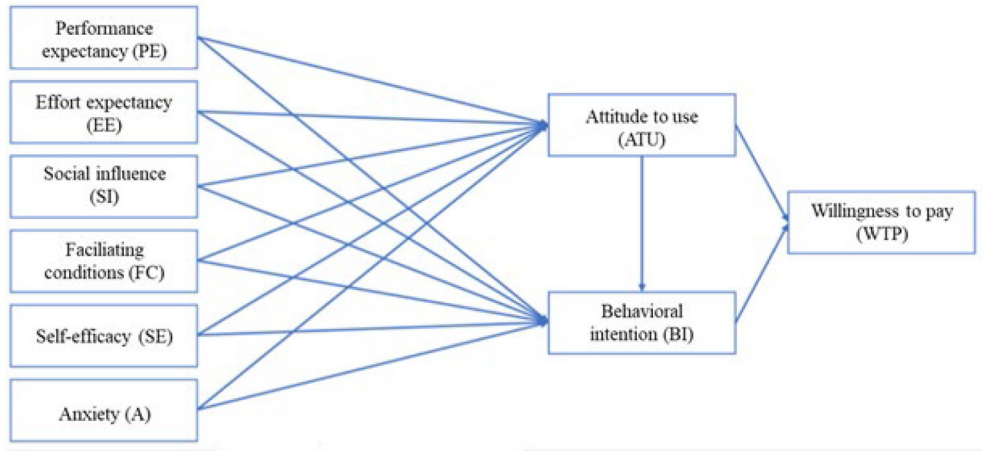

FIGURE 1 | Conceptual model.

To answer the questionnaire without having to use the system, a video was created that participants could watch as part of the survey and before answering the questionnaire. Davis (1985) used video to substitute for actual use of a system in his study and judged the method promising. The only criticism he noted was that the examination of usability—the counterpart of effort expectancy in the UTAUT model—was not optimal (Davis, 1985). The video was created in cooperation with our practice partner and included a presentation of Asport and its services. Screen recordings of the system were made, and a sample video of an automated recording was shown for the most realistic implementation possible.

Operationalization

Existing scales were used to make the variables of the conceptual model operational, and the constructs and items for testing acceptability were questioned in line with Venkatesh et al. (2003). The willingness to pay variable was tested according to Van Westendorp (1976). The acceptance constructs were queried using multi-item scales, as these have a higher information content than single-item scales. Furthermore, the reliability of multi-item scales tends to be higher due to the lower dependence of a single item (Kuß et al., 2014). Items were reviewed using a five-point scale ranging from "strongly disagree" to "strongly agree." This is because compared to the seven-point scale in line with Weijters et al. (2010), a five-point scale is recommended when the survey is conducted in a general population and regressions are subsequently calculated.

The following table shows the individual constructs with the respective items for the technology acceptance questionnaire based on Venkatesh et al. (2003). The items were translated into German and adapted to the context. Unlike what is shown here, items were randomized based on their similarity in the survey; according to Goodhue and Loiacono (2002), this can improve reliability (**Table 1**).

No consistent method was found in the literature that tests willingness to pay when the variable is part of a technology acceptance model. For example, willingness to pay was determined in Saha et al. (2020) through questions aimed at ascertaining whether the subject was willing to pay more in some instances. One question in the form of a statement read: *"I would continue to buy from this website if its prices increase somewhat"* (Saha et al., 2020, p. 11). Arogundade et al. (2016) also asked whether the respondent was willing to pay more for secure software development. In this work, however, willingness to pay is to be determined on the one hand for answering the hypotheses as well as on the other hand as itself. According to Reinecke et al. (2009), the Van Westendorp method is particularly suitable for estimating the price of innovations for which competitors and price expectations do not yet exist. This is the case with Asport, which is why a direct method was used. Willingness to pay is determined using Van Westendorp's (1976) four questions presented earlier but adapted to the context of this study. The standard evaluation of this method was conducted by aggregating the answers and comparing the results graphically for each question (Reinecke et al., 2009). In addition, to test the hypotheses, Question 2 was defined as an indicator of willingness to pay. As previously explained, this indicates the price that a respondent deemed expensive but would probably still be willing to pay. The reason for this is that hypothesis testing requires data at the level of the respondent. From the authors' point of view, this indicator is the most appropriate, as it suggests the maximum price that would be paid without losing the behavioral intention to buy.

Selection of Subjects

All the e-mail addresses of Swiss football clubs were available to the authors of this paper. As the focus here was on amateur clubs, those from the Raiffeisen Super League (1st division) and Brack.ch Challenge League (2nd division) were excluded. As the survey was produced in German, only football clubs in German-speaking regions were included. Since the survey was intended to test acceptance by potential users, those in the football club who would use such a system to carry out their duties were also written

TABLE 1 | Representation of the queried items per construct.

Construct	Items
Performance expectancy (PE)	I find the system useful for my activities in the club
	The system allows me to complete tasks faster
	Using the system increases my productivity
Effort expectancy (EE)	I find it easy to learn how to use the system
	I find it easy to use the system
	My interaction with the system is clear and understandable
	For me, it's easy to build the skills to use the system
Social influence (SI)	People in other roles in the club think I should use the system
	Players and players of the club think I should use the system
	People I care about think I should use the system
	People around me think I should use the system
Facilitating conditions (FC)	I have the necessary prerequisites to use the system
	I have the necessary knowledge to use the system
	The system is compatible with other systems used in the club
	I can get help from others if I have problems using the system
Self-efficacy (SI)	I could do a job or an activity with the system if...
	…there would be no one there to support and guide you
	…you could call someone for help if you got stuck
	… you'd have plenty of time to get a job done
	…you would only have the support function of the system to assist you
Anxiety (A)	I have reservations about using the system
	It scares me to think that I could lose a lot of data with the system if I press the wrong key
	I hesitate to use the system because of my fear of making mistakes that I cannot correct
	The system is a little intimidating to me
Attitude to use (ATU)	Using the system is a good idea
	The system makes my job at the club more interesting
	I enjoy working with the system
	I like working with the system
Behavioral intention (BI)	I intend to use the system for my function in the association
	I try to use the system for my function in the club whenever possible
	I plan to use the system on a regular basis

to individually—for example, board directors or those otherwise active in the sports sector. Accordingly, the survey population comprises all potential system users at amateur football clubs in German-speaking regions of Switzerland that play in the Promotion League or at a lower level.

The survey was sent by e-mail to the generic addresses of 797 football clubs as well as the personal accounts of those active at a senior management level or having a sports-related role. To further increase the number of participants, a reminder e-mail was sent out. In order to be able to answer the questionnaire without using the system, a video was created which the participants could watch directly in the survey and before answering the questionnaire. Davis (1985) already used video as a substitute for the effective use of a system in his study and judges the method as promising. The video includes an introduction of Asport as such, as well as the services. The structure of the video was chosen in such a way that Asport was introduced as such, since it must be assumed that many participants had never heard of Swisscom's product area. Subsequently, the viewers were guided through a video production process from video recording to distribution. Screen recordings of the system were made for the most realistic possible implementation and an example video of an automated recording was shown.

Quality Criteria

In quantitative studies, the three quality criteria of objectivity, validity, and reliability are relevant and discussed below. In this paper, evaluation objectivity is fulfilled by documenting the applied analysis methods and the data preparation procedure. This allows the results to be understood independently of individuals (Baur and Blasius, 2014). Furthermore, the objectivity of the online survey can be safeguarded, as the respondents answered a standardized survey and were not influenced by an interlocutor (Albers et al., 2009). However, interpretive objectivity cannot be guaranteed in social science research because the assessment of results varies from person to person (Baur and Blasius, 2014).

TABLE 2 | Demographic sample characteristics.

Characteristic	Characteristics	Volume	Percentage
Gender	Male	163	92.60%
	Female	12	6.80%
	Prefer not to say	1	0.60%
	Total	176	100%
Year of birth	1950–1959	15	8.50%
	1960–1969	44	25.00%
	1970–1979	45	25.60%
	1980–1989	43	24.40%
	1990–1999	29	16.50%
	Total	176	100%
Function within the club (multiple answers possible)	President	77	32.40%
	Treasurer	18	7.60%
	Secretary	12	5.00%
	Sports director	38	16.00%
	Coach	38	16.00%
	Employee	29	12.20%
	Player	26	10.90%
	Total	238	100%
League affiliation	9th	7	4.00%
	8th	42	23.90%
	7th	69	39.20%
	6th	30	17.00%
	5th	20	11.40%
	4th	7	4.00%
	3rd	1	0.60%
	Total	176	100%
Budget	Below 20,000 CHF	17	11.20%
	Between 20,000 and 50,000 CHF	19	12.50%
	Between 50,001 and 100,000 CHF	33	21.70%
	Between 100,001 and 250,000 CHF	54	35.50%
	Between 250,001 and 500,000 CHF	27	17.80%
	Above 500,001	2	1.30%
	Total	152	100%
	Missing	24	

Validity examines whether or not the survey instrument measures the desired facts (Atteslander et al., 2010), the focus of the three forms of validity testing in this study being construct validity. Since two existing models and their scales were used to test acceptance and willingness to pay, this criterion can be accepted as proven (Baur and Blasius, 2014).

The reliability of measurements shows how dependable they are and is shown when repetition leads to the same results (Atteslander et al., 2010). The consistency and temporal stability of the constructs for testing acceptability were determined by Cronbach's alpha in this study (Baur and Blasius, 2014). In addition, the standardized survey, which is one of the explicit survey methods, provides test-retest reliability (Berekoven et al., 2009). The Van Westendorp method can be assumed to have good implementation and evaluation reliability due to a clearly specified procedure, but this method has a weakness in the reliability of interpretation. Owing to the different price points provided by this method, the results can be interpreted in different ways, and applications for the business world derived from them (Reinecke et al., 2009).

RESULTS

Data collection—for which 797 Swiss football clubs were contacted by e-mail—was carried out between 30 April and 10 May 2020, and the results were processed online. One hundred and seventy-six complete and usable data sets were generated (response rate = 22.1%), and the IBM SPSS Statistics 26 tool was used for analysis. Of the football club survey participants, the majority were male (92.6%), and the age range extended from birth years 1950 to 1999. The largest number of subjects

TABLE 3 | Reliability of the constructs.

Construct	Reliability α
Performance expetancy (PE)	0.77
Effort expetancy (EE)	0.78
Social influence (SI)	0.86
Faciliating conditions (FC)	0.53
Self-efficacy (SE)	0.79
Anxiety (A)	0.77
Attitude to use (ATU)	0.80
Behavioral intention (BI)	0.85

were born between 1970 and 1979 (25.6%). When asked about their function in the club, respondents could select multiple answers, explaining the high number of responses (238). The questionnaire was most frequently completed by presidents (32.4%), followed by sports directors (16%) and coaches (16%). The table below summarizes the characteristics of the sample. Of the sports clubs surveyed, 25% already produce video recordings; the most common reason for 44.3% of these clubs was to analyze matches, followed by training (22.8%). In addition to the suggested answers, other reasons given were that the recording of matches in this league was compulsory in that regional association or that the video content was used to create highlight clips for online publication.

The majority of clubs said their first team played in the 3rd division league (39.2%), followed by the 4th division league (23.9%). As already mentioned, the two leading Swiss leagues—the Raiffeisen Super League and Brack.ch Challenge League—were not included in the survey. The largest number of respondents stated that their football club had an annual budget of between CHF 100,000 and CHF 250,000 (30.7%). For 18.8% of the clubs, the annual budget was between CHF 50,000 and CHF 100,000. Only two respondents reported having a budget of over CHF 500,000. League affiliation and yearly budget are two factors (among others) examined to determine whether they might influence willingness to pay for a video service (**Table 2**).

Participants were also asked to assess the added value of Asport in five different areas, and a five-point Likert scale from "very little added value" to "very great added value" was used for this purpose. The greatest added value of the system was in developing the performances of the clubs' first teams ($M = 3.72$).

Reliability Testing of the Constructs

Internal consistency must be established to test whether the individual items of a multi-item scale measure the same thing (Pallant, 2003), and one way to test for this is split-half reliability, which Cronbach's alpha can determine. All constructs except facilitating conditions have a Cronbach's alpha value of over $\alpha > 0.7$. For facilitating conditions, this is $\alpha = 0.53$. However, by omitting an item, the value could be increased to $\alpha = 0.6$. Even when the value lay below the typically required $\alpha = 0.7$, based on Schmitt (1996), the scale was retained in the model (**Table 3**).

Influence of Independent Variables

To test the hypotheses from the conceptual model, regression analysis was performed (Field, 2009). Hypotheses H1a, H1b, H1c, H1d, H1e, and H1f state that performance expectancy, effort expectancy, social influence, facilitating conditions, self-efficacy, and anxiety significantly influence attitude to use. A linear regression model was modeled using this dependent variable to test the hypotheses. The independent variables can explain 60% of the variance in attitude to use. The linear regression model is significant [$F_{(6, 169)} = 42.14$, $p < 0.001$]. The three constructs of performance expectancy, effort expectancy, and social influence have a positive significant impact on attitude to use. Here, effort expectancy ($\beta = 0.32$, $p < 0.001$) has the strongest influence, performance expectancy ($\beta = 0.31$, $p < 0.001$) has the second strongest influence, and social influence ($\beta = 0.28$, $p < 0.001$) has the weakest influence. Facilitating conditions, self-efficacy, and anxiety are not significant influencing variables. Hypotheses H1a, H1b, and H1c can therefore be accepted (**Table 4**).

Hypotheses H2a, H2b, H2c, H2d, H2e, and H2f state that performance expectancy, effort expectancy, social influence, self-efficacy, facilitating conditions, and anxiety significantly affect behavioral intention. The independent variables can explain 66% of the variance in behavioral intention. The linear regression model is significant [$F_{(6, 169)} = 54.97$, $p < 0.001$]. The three independent variables performance expectancy, effort expectancy, and social influence have a significant positive impact on behavioral intention. Social influence ($\beta = 0.45$, $p < 0.001$) had the strongest influence, performance expectancy ($\beta = 0.33$, $p < 0.001$) had the second strongest influence, and effort expectancy ($\beta = 0.20$, $p = 0.005$) had the weakest influence. The constructs facilitating conditions ($\beta = 0.036$, $p = 0.554$), self-efficacy ($\beta = 0.09$, $p = 0.082$), and anxiety ($\beta = 0.02$, $p = 0.741$) were not significant. Consequently, the null hypothesis can be rejected for hypotheses H2a, H2b, and H2c, and the named can be confirmed (**Table 5**).

Hypothesis H3 states that attitude to use has a significant influence on behavioral intention. This was tested below by the linear regression model. The independent variable can explain 58% of the variance of the dependent variable. The model is significant [$F_{(1, 174)} = 235$, $p < 0.001$]. Attitude to use has a positive significant effect on behavioral intention ($\beta = 1.07$, $p = 0.001$). Moreover, the BCa confidence interval obtained by the bootstrapping procedure does not include the value zero, and accordingly, the result is robust (Urban and Mayerl, 2018). Hypothesis H3 can therefore be confirmed (**Table 6**).

Hypothesis H4 tests whether attitude to use has a significant impact on willingness to pay. The independent variable can explain 2.5% of the variance of the dependent variable. The regression model is significant [$F_{(1, 174)} = 4.48$, $p = 0.036$]. Attitude to use has a positive significant effect on willingness to pay ($\beta = 387.461$, $p = 0.022$). The model is robust because the BCa confidence interval does not include the value zero. Hypothesis H4 is therefore confirmed (**Table 7**).

Hypothesis H5 tests whether behavioral intention has a significant impact on willingness to pay. The independent

TABLE 4 | Influence of independent variables on attitude to use.

Model summary[a]								
Model	***R***	***R*²**	**Corrected *R*²**	**SE**	**Durbin-Watson**			
1	0.77[a]	0.60	0.59	0.39	2.06			
Anova[a]								
Model		**Square-sum**	**Df**	**Mean of the squares**	***F***	**Sig.**		
1	Regression	38.72	6	6.45	42.14	0.000[b]		
	Non-std. residuals	25.89	169	0.15				
	Total	64.61	175					
Coefficients[a]								
Model		**Non-Std. Coefficients**		**Std. Coefficients**	**T**	**Sig.**	**Collinearity Statistics**	
		β	**SE**	**Beta**			**Tolerance**	**VIF**
1	(Constant)	0.54	0.33		1.63	0.104		
	UTAUT_PE	0.20	0.04	0.31	5.17	0	0.67	1.50
	UTAUT_EE	0.34	0.08	0.32	4.29	0	0.42	2.36
	UTAUT_SI	0.24	0.05	0.28	4.76	0	0.67	1.49
	UTAUT_FC	0.09	0.07	0.09	1.41	0.16	0.53	1.88
	UTAUT_SE	0.05	0.05	0.06	1.10	0.27	0.82	1.21
	UTAUT_A	−0.03	0.05	−0.03	−0.53	0.60	0.72	1.40

[a]*Dependent variable: UTAUT_ATU.*
[b]*Influencing variables: (constant), UTAUT_PE, UTAUT_EE, UTAUT_SI, UTAUT_FC, UTAUT_SE, UTAUT_A.*

variable can explain 1% of the variance of the dependent variable. The regression model is not significant [$F_{(1, 174)} = 1.79$, $p < 0.183$]. Therefore, the influence of behavioral intention on willingness to pay is also not significant ($\beta = 175.29$, $p = 0.147$). This is also confirmed by the BCa confidence interval, which passes through the zero point. Hypothesis H5 is therefore rejected (**Table 8**).

Influence of the Moderators on Attitude to Use

Hypotheses H6a,b,c,d,e,f and H7a,b,c,d,e,f test whether the relationship between the independent variables and attitude to use is affected by age or gender. For the moderator analysis, we used the SPSS macro PROCESS (Version 3.5) by Andrew Hayes, which is considered to be particularly strong for testing (Baltes-Götz, 2018). The following table summarizes the results of the analyses for the moderator variables of age and gender (**Table 9**).

The table shows that the models are significant in each case, but the interaction effect between the individual independent variables and age and gender is not. Only in the relationship between facilitating conditions and attitude to use was a significant age influence found. The model is significant and explains 27% of the variance [$F_{(3, 172)} = 19.72$, $p < 0.0001$]. The interaction effect is significant ($p = 0.0258$), and the results show that as the age variable increases, the effect also becomes stronger. Age as a variable was questioned by asking the year-of-birth range. Accordingly, the effect of age on attitude to uses increases the younger the users are. Hypothesis H6d is therefore accepted, and the remaining hypotheses H6 and H7 are rejected.

Influence of Moderators on Behavioral Intention

Hypotheses H8a,b,c,d,e,f and H9a,b,c,d,e,f test whether the relationship between the independent variables and behavioral intention is affected by age or gender. The PROCESS macro was again used for the calculation. The following table summarizes the results of the analyses for the moderator variables of age and gender (**Table 10**).

The table shows that most of the models are significant in each case, but the interaction effect between the individual independent variables and age and gender is not. For both the moderator age and gender, the model is not significant for the independent variable fear [age: $F_{(3, 172)} = 2.19$, $p = 0.0909$; gender: $F_{(3, 172)} = 2.26$, $p = 0.0831$]. Only for the independent variable performance expectancy and the moderator age is both the model [$F_{(3, 172)} = 45.73$, $p < 0.0001$] and the interaction effect significant ($p = 0.0409$). The evaluation shows that the effect, in turn, also becomes stronger with an increase in age. Age as a variable was questioned by asking the year-of-birth range. Accordingly, the effect of age on performance expectancy increases the younger the users are. Hypothesis H8a is therefore accepted, and the remaining hypotheses of H8 and H9 are rejected.

Willingness to Pay

Willingness to pay was tested using the Van Westendorp method (1976). In addition to the use of values in the conceptual model, the classical analysis of this model is presented below. In the

TABLE 5 | Influence of independent variables on behavioral intention.

Model summary[a]								
Model	***R***	***R*²**	**Corrected R2**	**SE**	**Durbin-Watson**			
1	0.81	0.66	0.65	0.51	2.14			
Anova[a]								
Model		**Square-sum**	**Df**	**Mean of the squares**	***F***	**Sig.**		
1	Regression	84.63	6	14.11	54.97	0		
	Non-std. residuals	43.36	169	0.26				
	Total	128.00	175					
Coefficients[a]								
Model		**Non-Std. coefficients**		**Std. coefficients**	**T**	**Sig.**	**Collinearity statistics**	
		β	**SE**	**Beta**			**Tolerance**	**VIF**
1	(constant)	−1.15	0.43		−2.68	0.01		
	UTAUT_PE	0.30	0.05	0.33	6.07	0	0.67	1.50
	UTAUT_EE	0.29	0.10	0.20	2.83	0.01	0.42	2.36
	UTAUT_SI	0.53	0.06	0.45	8.32	0	0.67	1.49
	UTAUT_FC	0.05	0.08	0.04	0.59	0.55	0.53	1.88
	UTAUT_SE	0.11	0.06	0.09	1.75	0.08	0.82	1.21
	UTAUT_A	0.02	0.07	0.02	0.33	0.74	0.72	1.40

[a]*Dependent variable: UTAUT_BI.*

survey, subjects were asked to answer the four willingness-to-pay questions. The annual license price for Asport, including the automated camera system, the content management system, and the video portal, had to be quantified. In our evaluation, a price range of CHF 500 was initially defined, and then the frequency distributions per question were calculated using Microsoft Excel. To map the results, these frequencies were cumulated on a percentage basis. The questions resulted in the four curves: "too expensive," "expensive," "cheap," and "too cheap." These depict willingness to pay in relation to percentage frequency. As described in the theory section, in preparation for the evaluation, the inverses of the two graphs "expensive" and "cheap" were formed and labeled "not expensive" and "not cheap."

Part of Van Westendorp's analysis is to define the acceptable price range for a product or service. To determine the acceptable price range, the inverses of the "favorable" and "expensive" curves are formed and defined as "not favorable" and "not expensive" (Reinecke et al., 2009). The intersection of the two curves "not cheap" and "too cheap" is chosen as the lower price limit. However, this does make sense, as an additional reduction in price would lead to the proportion of those who consider the product to be too favorable exceeding the proportion of those who consider it not favorable (Reinecke et al., 2009). The price ceiling is determined by the intersection of the "too expensive" and "not expensive" curves and is also described as the point of marginal expensiveness. An increase in price makes no sense since in that case, the proportion of people who would describe the product as too expensive exceeds those who see the product as not expensive (Reinecke et al., 2009). The lower price limit, indicated by the bar, is determined by the intersection of the "not cheap" and "too cheap" curves at CHF 270. The upper price limit is shown by the intersection of the "not expensive" and "too expensive" curves at CHF 990 (**Figure 2**).

In addition to the acceptable price range, the method also offers guidance on the optimal price point. The optimum price point is defined by the intersection of the two curves "too cheap" and "too expensive." In this case, the same number of potential customers indicates that they perceive the product as too cheap or too expensive (Khandker and Joshi, 2019). This score does not take into account cost structures but shows the optimal price from the perspective of the customer. This is the case when customer resistance to purchase is at its lowest (Lewis and Shoemaker, 1997). The indifference price is formed from the curves "expensive" and "cheap" and represents the fact that at this price an equal number of respondents state that it is expensive or cheap (Khandker and Joshi, 2019). According to Van Westendorp, this price usually represents the median price that customers effectively pay or that of the market leader (1976). Moreover, the difference between the indifference price and the optimal price shows the price sensitivity of potential customers. The smaller the difference, the more sensitive (Reinecke et al., 2009). The figure below shows that the optimal price point lies at the intersection of the "too expensive" and "too cheap" curves at CHF 485. The indifference point can also be determined based on the intersection of the "cheap" and "expensive" graphs at CHF 700 (**Figure 3**).

When all three independent variables are included, it is shown that Levene's test is significant [$F_{(23,\ 124)} = 1.83$, $p = 0.019$]

TABLE 6 | Influence of attitude to use on behavioral intention.

Model summary[a]							
Model	***R***	***R*²**	**Corrected *R*²**	**SE**	**Durbin-Watson**		
1	0.76	0.58	0.57	0.56	1.8		
Anova[a]							
Model		**Square-sum**	**df**	**Mean of the squares**	***F***	**Sig.**	
1	Regression	73.54	1	73.54	235.00	0	
	Non-std. residuals	54.45	174	0.31			
	Total	128.00	175				
Bootstrap for coefficients[a]							
Model		***β***	**Bootstrap**				
		Distortion	**SE**	**Sig. (2-sided)**	**BCa 95% confidence interval**		
					Lower value	**Upper Value**	
1	(Constant)	−0.64	0.01	0.25	0.01	−1.17	−0.12
	UTAUT_ATU	1.07	−0.00	0.07	0.00	0.94	1.18

[a]*Dependent variable: UTAUT_BI.*

TABLE 7 | Influence of attitude to use on willingness to pay.

Model summary[a]							
Model	***R***	***R*²**	**Corrected *R*²**	**SE**	**Durbin-Watson**		
1	0.16	0.03	0.02	1,472.16	1.74		
Anova[a]							
Model		**Square-sum**	**Df**	**Mean of the squares**	***F***	**Sig.**	
1	Regression	9,699,275.3	1	9,699,275.3	4.48	0.04	
	Non-std. residuals	377,101,043	174	2,167,247.4			
	Total	386,800,318	175				
Bootstrap for coefficients[a]							
Model	***β***		**Bootstrap**				
			Distortion	**SE**	**Sig.**	**BCa 95% confidence interval**	
					(2-sided)	**Lower value**	**Upper Value**
1	(Constant)	57.52	9.85	658.43	0.93	−1,123.02	1,329.58
	UTAUT_ATU	387.46	−2.02	178.27	0.02	50.84	719.45

[a]*Dependent variable: UTAUT_WTP.*

and, accordingly, variance homogeneity cannot be assumed. An additional test shows that when the independent variable budget is excluded, the Levene test is no longer significant [$F_{(7,\ 168)} = 0.87$, $p = 0.532$] and the conditions are met. Accordingly, the results of the two-factor ANOVA with the independent variables league and video are presented below first, followed by a one-factor ANOVA with the independent variable budget. The two-factor analysis of variance tests whether there is a significant difference in the assessment of willingness to pay depending on which league a club plays in and whether a club already produces video recordings. It is found that the overall model is not significant [$F_{(7,\ 168)} = 0.45$, $p = 0.866$] and accordingly there is no significant difference in the assessment. As noted, by using the Welch test, the test using the single factor ANOVA of whether there is a significant difference in the assessment of willingness to pay, depending on how much the club's budget is, is possible. This is despite the fact that Levene's test shows significant values [$F_{(3,\ 148)} = 3.87$, $p = 0.011$]. The results of Welch's test show that there is a significant difference in the assessment [$F_{(3,\ 73)} = 2.78$, $p = 0.047$]. To find out

TABLE 8 | Influence of behavioral intention on willingness to pay.

Model summary[a]							
Model	***R***	R^2	**Corrected** R^2	**SE**	**Durbin-Watson**		
1	0.10	0.01	0.00	1,483.37	1.74		
Anova[a]							
Model		**Square-sum**	**df**	**Mean of the squares**	***F***	**Sig.**	
1	Regression	3,932,864.3	1	3,932,864.3	1.79	0.18	
	Non-std. residuals	382,867,454.2	174	2,200,387.7			
	Total	386,800,318.5	175				
Bootstrap for coefficients[a]							
Model		***β***	**Bootstrap**				
			Distortion	**SE**	**Sig.**	**BCa 95% confidence interval**	
					(2-sided)	**Lower value**	**Upper value**
1	(Constant)	917.26	−4.21	398.75	0.02	132.39	1,672.39
	UTAUT_BI	175.30	1.59	116.46	0.15	−35.02	409.34

[a]*Dependent variable: UTAUT_WTP.*

TABLE 9 | Influence of moderators on attitude to use.

Designation	R^2	**df**	***F***	**Sig. (model)**	**Sig. (interaction-effect)**	**Result**
H6a: PE×Age	0.34	3/172	27.88	<0.001	0.09	–
H6b: EE×Age	0.37	3/172	24.91	<0.001	0.11	–
H6c: SI×Age	0.35	3/172	35.52	<0.001	0.12	–
H6d: FC×Age	0.27	3/172	19.72	<0.001	0.03	+
H6e: SE×Age	0.13	3/172	6.63	<0.001	0.05	–
H6f: A×Age	0.11	3/172	5.56	<0.05	0.07	–
H7a: PE×Gender	0.33	3/172	26.46	<0.001	0.53	–
H7b: EE×Gender	0.35	3/172	23.99	<0.001	0.89	–
H7c: SI×Gender	0.33	3/172	31.12	<0.001	0.58	–
H7d: FC×Gender	0.24	3/172	13.41	<0.001	0.40	–
H7e: SE×Gender	0.11	3/172	6.22	<0.001	0.89	–
H7f: A×Gender	0.11	3/172	4.87	<0.05	0.33	–

which factors are different, a *post-hoc* test is conducted using Games-Howell procedure (IBM, 2014). There is a significant difference (p =0.049) in the assessment of willingness to pay between clubs that have a budget below CHF 50,000 (M = 1040.53, SD = 1120.40) and those that have a budget above CHF 250,000 (M = 2215.45, SD = 2127.29).

DISCUSSION

The following sub-chapters are structured according to the conceptual model and the hypotheses derived from it, with the moderator analysis integrated into the respective chapters. To conclude, the willingness to pay findings are discussed independently of the conceptual model.

Hypotheses H1a,b,c,d,e,f postulate a direct significant influence of performance expectancy, effort expectancy, social influence, facilitating conditions, self-efficacy, and anxiety on attitude to use. The results of the study show that the hypotheses H1a, H1b, and H1c can be confirmed. In the basic model of Venkatesh et al. (2003), the direct influences of the independent variables on attitude to use were not tested, but only that of attitude to use on behavioral intention. In contrast, the meta-analysis by Dwivedi et al. (2019) also examined the direct influence on attitudes toward use. However, the two independent variables self-efficacy and anxiety were omitted. The meta-analysis concluded that the strongest influencing factor was performance expectancy, followed by effort expectancy and social influence (Dwivedi et al., 2019). This contrasts with this study, in which social influence is also the weakest factor, but effort expectancy has a stronger effect than performance expectancy.

Moderator analysis to test hypotheses H6 and H7 with the sub-hypotheses shows only one significant influence of a moderator on the relationship between the independent

TABLE 10 | Influence of moderators on behavioral intention.

Designation	R2	Df	*F*	Sig. (model)	Sig. (interaction-effect)	Result
H8a: PE×Age	0.43	3/172	45.73	<0.001	0.04	+
H8b: EE×Age	0.23	3/172	14.33	<0.001	0.23	–
H8c: SI×Age	0.50	3/172	91.07	<0.001	0.41	–
H8d: FC×Age	0.16	3/172	8.89	<0.001	0.14	–
H8e: SE×Age	0.11	3/172	5.49	<0.05	0.20	–
H8f: A×Age	0.04	3/172	2.19	0.09	0.87	–
H9a: PE×Gender	0.42	3/172	40.85	<0.001	0.49	–
H9b: EE×Gender	0.22	3/172	14.71	<0.001	0.58	–
H9c: SI×Gender	0.50	3/172	84.69	<0.001	0.15	–
H9d: FC×Gender	0.14	3/172	8.28	<0.001	0.34	–
H9e: SE×Gender	0.09	3/172	4.48	<0.05	0.77	–
H9f: A×Gender	0.04	3/172	2.26	0.08	0.95	–

variables and attitude to use. Hypothesis H6d is accepted because age influences the effect between facilitating conditions and attitude to use. Moreover, the influence of the independent variables becomes significant only through the influence of the moderator. This effect is further amplified in younger people. The relationship between facilitating conditions and attitude to use is also evidenced by Dwivedi et al. (2019) but without a moderator effect, as these were not evaluated. The fact that most moderator-related constructs were rejected (H6-H9) is probably due to the fact that age and gender are less important in the use of ICT in a professional context than, for example, in the context of social media in individuals' leisure time. Employees and managers are accustomed to using certain ICT, whether the employees are younger or older or male or female. However, the gender-specific result should be treated with caution due to the high number of male participants (92.6%).

Hypotheses H2a,b,c,d,e,f postulate a significant influence of performance expectancy, effort expectancy, social influence, facilitating conditions, self-efficacy, and anxiety on behavioral intention. As reported in the results section of this paper, hypotheses H2a, H2b, and H2c were accepted. Unlike the dependent variable attitude to use, social influence has the strongest effect, followed by performance expectancy and effort expectancy. The impact strength of the determinants also differs compared with the original model. The results from Venkatesh et al. (2003) show that social influence was significant only by moderators, whereas in this study, the two moderators tested (age and gender) show no interaction effect. Performance expectancy was the strongest factor in the initiators' UTAUT model, and the effect was greater for males and younger individuals (Venkatesh et al., 2003). A moderator effect of age but not for gender was also found in this study. In contrast to the study by Venkatesh et al. (2003), a significant relationship was also found for effort expectancy, but with no moderator effect. The results of facilitating conditions, self-efficacy, and anxiety are consistent with those of the original study, and no significance was demonstrated in either study (Venkatesh et al., 2003). These findings differ from the meta-analysis by Khechine et al. (2016), which demonstrated an influence on behavioral intention in facilitating conditions. In this paper, behavioral intention is equated with acceptance of the system, and the results show that 66% of the variance can be explained. The result is similar to Venkatesh et al. (2003), who could explain 70% of behavioral intention. The null hypothesis was rejected for hypotheses H2a, H2b and H2c, as the constructs facilitating conditions, self-efficacy and anxiety were not significant, in contrast to Venkatesh et al. (2003). One reason might be that our study surveyed club managers rather than end consumers. The use of ICT is common in a business context, which is one reason why the constructs did not show significance.

Hypothesis H3 tested whether there was a significant effect of attitude to use on behavioral intention. This effect could be demonstrated, and the hypothesis was confirmed. However, the literature shows contradictory results. No significance was demonstrated by Venkatesh et al. (2003) but it was in the meta-analysis by Dwivedi et al. (2019).

Hypotheses H4 and H5 tested whether there was a significant influence of the variables attitude to use and behavioral intention on willingness to pay. It was shown that such an effect could only be demonstrated for attitude to use. However, the level that could explain this relationship was low at 2.5%, showing that other determinants explain much of the variance in willingness to pay—but these were not part of this study. While studies could be found in the literature that have inserted willingness to pay in some form into technology acceptance models such as TAM or UTAUT, there is no standard implementation variant. However, it can be said that significant effects have also been demonstrated in the literature, for example, in Lee et al. (2015), which adapted the TAM and showed that customer attitudes affect willingness to pay. Another study again chose willingness to pay as the study endpoint but omitted attitude to use and behavioral intention (Stephanidis, 2019). The results showed that performance expectancy and facilitating conditions as variables from UTAUT, as well as trust and long-tail effects, have an impact on willingness to pay. This explained the 67% variance and, accordingly, significantly more than in the present paper with a variable attitude to use (Stephanidis, 2019). That the influence of behavioral intention on willingness to pay is not significant and

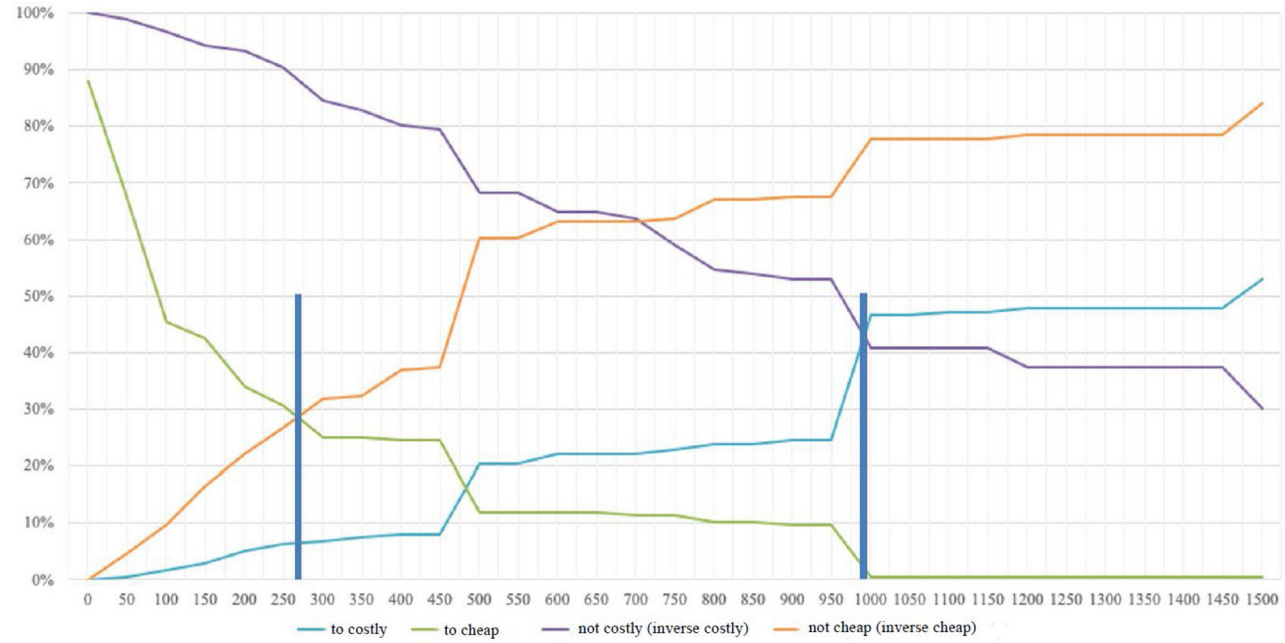

FIGURE 2 | Determination of the acceptable price range according to Van Westendorp (1976).

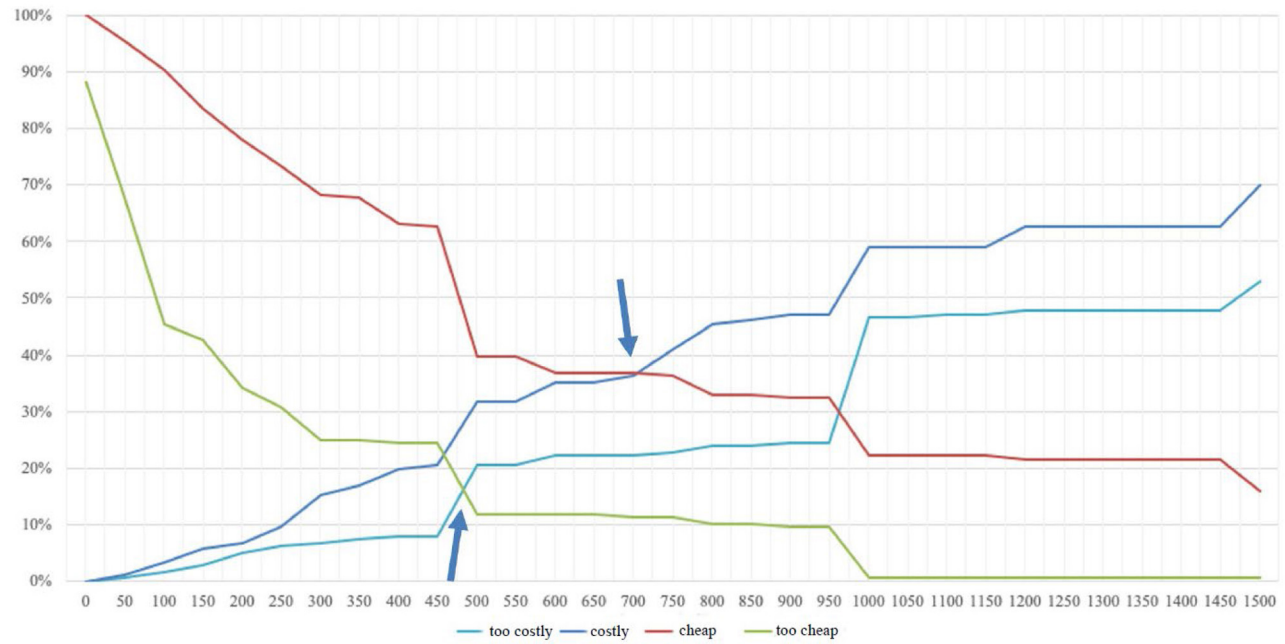

FIGURE 3 | Determination of the optimal price point according to Van Westendorp (1976).

the null hypothesis can therefore be rejected for hypotheses H2a is probably caused by the fact that the benefits for the user to use Asport were not clearly evident.

The results of willingness to pay according to the Van Westendorp method show that the price range for the three service components of Asport starts at CHF 270 per year, rising to CHF 990. According to Reinecke et al. (2009), it is precisely this price range that is relevant for innovative services where price expectations do not yet exist, as is the case of Asport. With this knowledge and the optimal price point (which is lower than the upper point of the price range), Asport's pricing can be based on willingness to pay. If we compare the results

with the current prices offered by Asport, we find that they are much higher than the sports clubs' willingness to pay. If one disregards the initialization fee, which the club must pay just once, the club will spend at least CHF 2,900 per year (Asport, 2020). The difference from the upper price limit is CHF 1,910, which is a high discrepancy at this relatively low-price level. Even more significant is the difference from the indifference point, at CHF 700. The optimal price point, which indicates the lowest resistance to purchase, was determined at CHF 485—a difference of CHF 2,415 from the Asport price. In other words, willingness to pay is 83.3% lower than the asking price. However, variations exist in the assessment of willingness to pay. For example, it has been demonstrated that clubs with a budget of less than CHF 50,000 are significantly less willing to pay than those with a budget of over CHF 250,000.

Implications for Theory

When considering what contribution this paper makes to state-of-the-art technology acceptance research, several aspects need to be noted. There are thousands of studies that have applied or adapted the UTAUT model. Consequently and according to Shachak et al. (2019), a high level of knowledge has been achieved in this research area. Due to some consistency in the results, the new explanatory content is explicit. However, some studies apply technology acceptance in the context of sports technologies (among others: Hur et al., 2011; Chien-Ta and Chao-Hsiang, 2015), but none examines a comparable service with this level of functionality. In addition, the studies identified often focus on the private end-consumer rather than a sports club (among others: Kwak and McDaniel, 2011; Ibrahim, 2014; Byun et al., 2018; Kim and Chiu, 2019). The findings discussed in the previous chapter also show that deviations from the basic model could be identified, for example, that there is a direct relationship between the independent variables attitude to use and further to behavioral intention or regarding the strongest drivers acting on behavioral intention. Another aspect is the integration of the willingness to pay variable into the UTAUT model. As mentioned above, although there are studies in which willingness to pay plays a role in technology acceptance models, none can be considered a standard implementation. Accordingly, this paper contributes to this specific area and through the application of the evaluation method. This is because it was possible to prove that attitude to use has an influence, even though the explanatory power is low at 2.5%. In summary, based on the reasons listed, a contribution to research could be made in this context.

Implications for Asport and Sports Industry

This study shows the relevant factors that lead to behavioral intention or acceptance of Asport services among amateur football clubs in German-speaking Switzerland. The three independent variables of social influence, performance expectancy, and effort expectancy are all important, as is attitude to use. Although acceptance does not influence willingness to pay, it does influence attitudes to use, which underlines the relevance of this factor. Accordingly, the facilitating conditions, which have an additional effect on attitude to use through the moderator age, must also be considered. The information gained helps to set the right focus, such as product design or communication, to influence and improve user acceptance through targeted measures.

Social influence emerges as the most decisive factor in acceptance. This means that it is people in both the private and club environment who greatly influence whether the system is used or not. One way to use this influencing factor to your advantage is to either target opinion leaders or make the result of the product itself somehow accessible and shareable to the mass. In the case of targeting opinion leaders, the aim must be to get people with a lot of influence to be positive about buying and using the system, and to talk about it. From Asport's perspective, this can be beneficial on two levels. Once the sports club has obtained the system (and the aim is to get as many potential users as possible to buy it), an attempt can be made to accelerate this process via opinion leaders and win over other sports clubs as customers. If opinion leaders in the form of associations or other sports clubs in the region use the system and talk about it, this can boost sales. In the case of making the product itself somehow accessible and shareable to the fans of the clubs, the aim must be to integrate some kind of shareability function from Asport to social media platforms like Instagram, YouTube and TikTok. From Asport's perspective, this can be beneficial on two levels. The distribution of content snippets produced thanks to Asport's technology enhance the company's goal of making clubs more attractive to potential fans, players and club contributors. If other club officials see these content snippets, it raises the brand awareness of Asport as a brand and therefore will improve its standing in sales negotiations. For both cases, integration of opinion leaders to the marketing mix and shareability of the content produced, club environments and especially their management must comprehend the market stakeholders and know the personas contained by it, in order to be able to decide upon the right opinion leaders characteristics and content distribution platforms to work with. This development opens up the potential for smaller marketing agencies focusing on amateur sports clubs.

To meet the user performance expectancy and promote acceptance, services must offer added value in the club's day-to-day activities. It is important that tasks can be completed more quickly, and the system seen as useful. To achieve this, the precise needs of the user must be understood. Our findings showed that the sports clubs surveyed saw the greatest added value in the development of sporting performance. Furthermore, clubs that already produce video recordings use them mainly to analyze matches in training sessions. This shows that the focus of the clubs is on their sport. Asport can use this information to optimize and further develop the product, emphasizing these benefits. A priority should be placed on younger people, as they place particular value on system performance. However, other areas of added value, such as marketing, should not be overlooked. Since Asport offers hitherto unknown new possibilities for clubs, there is still a lack of empirical evidence with which to evaluate these potential benefits. This should be considered when communicating to the public, for example, through the use of reference projects, enabling added value to

be accessible and understandable when implementing the system at a sports club. For the sports industry this highlights the need of clarification of anticipation of application's expectations. This will also have an influence on future human resource planning and recruitment. Future management officials in the sports industry will have to understand technological advancements, in order to be able to take into consideration or even use new services such as Asport. This will have implications in sports management education as well.

Another aspect that could help Asport gain acceptance from users concerns effort expectancy. Services must be as straightforward, clear, and comprehensible as possible. It is recommended that Asport works with users to identify potential problems or barriers to use and feed these back into product design. It is also important that learning how to use the system is as simple as possible and requires minimal effort. One option would be to offer help in the form of online tutorials, which explain the use of the system through videos or webinars. Here, the key functions are presented, and users can interactively discuss any challenges they have faced.

The area of facilitating conditions is complex, and an essential aspect is that the prerequisites for using Asport are as low as possible. Since most people now have several digital devices, online access is assumed. Nevertheless, the system should be compatible with existing systems in everyday use, for example, if clubs are already using analytic tools. Since Asport is an open system, interfaces can offer the necessary links (Asport, 2020). One possible acceptance lever would be to guarantee that users can get help quickly and easily when issues arise, whether through direct contact with Asport or via an online community platform. Since the influence of facilitating conditions on attitude to use only becomes relevant through the moderator of age and the effect is intensified in younger people, the requirements of this target group should be given particular attention when analyzing and implementing features.

Evaluation of willingness to pay by football clubs has shown that this is significantly lower than the price offered by Asport. However, it would be presumptuous to deduce that the price should be reduced to that level; instead, willingness to pay should be investigated in greater detail. Notwithstanding, the financial possibilities of a sports club in the amateur sector are limited, and accordingly, the price ultimately determines whether technology is purchased or not (Volkmann et al., 2019). This is also confirmed in the findings since sports clubs with higher budgets show a greater willingness to pay. Of course, it could be argued that the first step is to identify sports clubs with higher budgets and focus sales efforts on them. However, there might be better and more inclusive ways to make Asport, still, a service for amateur clubs, too. One logical way would be to demonstrate how sports clubs can benefit financially from Asport. Points in favor of purchasing Asport can be created if the clubs receive empirical figures based on reference projects about how much additional money they could earn through digital marketing, especially when this amount exceeds the annual price in the best-case scenario. At the same time, it should be determined which functions the clubs perceive as benefits and how this affects their willingness to pay. Another way to stay more inclusive with pricing, would be to find and test additional pricing tactics for the services offered by Asport, which in turn could be revolutionary for the sports industry, for example trying to introduce dynamic pricing based on the incremental revenues obtained thanks to the use of the technology itself. These methods can be tested using conjoint analysis and provide essential clues for development and communication focus (Völckner, 2006). These measures must positively influence willingness to pay through targeted product design and, above all, communication with potential customers. Owing to the novelty of these services, such public relations activity is paramount.

Limitations and Outlook

This study has limitations that must be considered when interpreting the results and recommendations. One limitation is that the participants in the survey were probably unaware of the Asport system and certainly had never used it before. Since effective prior use was not possible in this research, a 3-min video was created to introduce Asport and its features. First, this may have made it difficult to answer the questions based on the constructs of the UTAUT model. Second, the subjects may not have fully understood the added values and benefits of the system—or the video may not have explained them sufficiently. Therefore, it is possible that our assessment of willingness to pay was adversely affected, producing the resulting low values and effective prices.

Another potentially critical area is the evaluation procedure. When evaluating social and behavioral science research questions, multiple regression analysis and structural equation modeling are appropriate (Kupper, 1997). The structural equation model is considered more robust, and it can be analyzed more comprehensively since direct relationships as well as an entire model can be assessed (Kupper, 1997). This limitation has been shown, among other things, in the handling of moderators. Due to the limited possibilities of the PROCESS macro in SPSS, these could only be considered in isolation. This means that only the interaction effect of one independent variable and one moderator on the dependent variable could be tested at a time.

In a future study and for a deeper understanding of acceptance, the survey would need to be conducted among actual Asport users rather than potential users. This would prevent people who have no contact with the system whatsoever from answering the questionnaire, as was possible in this study. In this case, such participants were asked to answer from the perspective of the club as a whole. Furthermore, the survey should not have been conducted in one session but several times in succession. In this way, the experience and learning effect could have be verified (Venkatesh et al., 2012). In such a study, in which actual users are interviewed, not only the factors that lead to acceptance should be analyzed, but also whether these people show acceptance, i.e., accept the use of the system. This is because a meaningful statement about whether acceptance exists can only be made through repeated use over time (Kollmann, 1998), and this brings the desired added value in practice. For the generalizability of the results and to make statements about amateur sport as a whole, clubs other than football clubs must be included in future studies.

When asking about willingness to pay, a limitation was created by our sample size. Reinecke et al. (2009) state that for a reliable statement, the rule of thumb is for at least 300 subjects to participate in the survey. This study did not achieve that number. As mentioned earlier, further information regarding willingness to pay is of interest. However, from a theoretical point of view, it is necessary to determine which factors influence the willingness to pay and—from the company's point of view—it is relevant to find out what benefit components influence the assessment to what extent.

In this paper, the focus has been on video-related services for football clubs in Switzerland. It will be fascinating to see how this market develops and to what extent, for example, automated camera systems will become standard in the future. However, the opportunities for Asport and other companies in the sports technology market can influence many other stakeholders. Whether and to what extent the currently existing structures and roles of media, sponsors, or clubs will change because of the possibilities offered by this technology remains to be seen.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

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

AUTHOR CONTRIBUTIONS

MH, FH, and VS contributed to conception and design of the study and wrote sections of the manuscript. MH organized the database. FH performed the statistical analysis. MH wrote the first draft of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

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Congruity of Virtual Reality In-Game Advertising

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With virtual reality (VR) video game users beginning to see beta advertisements within game play, this conceptual article adds a needed digital and interactive marketing research foundation to the new construct of VR in-game advertising (IGA) activation. New consumer VR technology continues to disrupt traditional media as a $7.7 billion USD industry, that is expected to reach $57.55 billion by 2027. As such, marketing researchers must continue to evolve and understand the interdisciplinary VR research evolution as many VR users are likely to view IGA as intrusive. IGA and VR are not new constructs, but IGA within VR is unique as VR consumers have not yet experienced VR IGA intrusion. This article utilizes a sport marketing focus to provide an industry specific set of examples for the reader, however this article can be applied to broader fields including communications and interactive marketing. The main contributions of this article are 2-fold. First the development of a *VR In-Game Advertising Congruity Framework* is developed through a review of the literature and application to VR IGA in the topical areas of *congruity* of the IGA, *interactivity* of the IGA, *intrusiveness* of the IGA, *realism* of the experience, *telepresence, brand awareness*, and *attitude* toward the IGA. Secondly, a proper VR context definition of telepresence is provided through review of the literature that takes into account the interaction of a VR participant. This article aims to aid marketers in making informed IGA development decisions through strategic choice, via a centralized VR IGA congruity framework, that not only enhances brand awareness, but leaves participants with a favorable attitude toward the IGA to increase sales activation.

Keywords: virtual reality (VR), In-Game Advertising (IGA), marketing, video gaming, congruity, telepresence

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INTRODUCTION

The purpose of this conceptual article is to add a much needed timely digital and interactive marketing research foundation to virtual reality (VR) in-game advertising (IGA). In July 2021 people with Oculus Quest headsets are scheduled to start seeing beta advertisements in virtual reality (Olson, 2021). IGA is not a new construct, but IGA in VR is as unique as this conceptual analysis since VR consumers have not yet experienced VR IGA intrusion. As this new consumer VR technology continues to disrupt traditional media, marketing researchers must continue to evolve and understand the interdisciplinary VR research evolution. This work uses a sport video game context to examine the emerging VR gaming industry, the user intrusion anticipated by IGA, and the VR IGA's sport marketing ramifications across disciplines such as advertising.

Due to the novelty of VR as well as the importation of ideas from fields other than sport marketing, there are numerous conceptual and definitional inconsistencies in the literature around terms such as presence, spatial presence, and telepresence along with elements related to the immersive characteristics of VR technology. This concept is practically relevant to the design and evaluation of media products and human-computer interactions, such as VR games and IGA. For this reason, scholars have paid much attention to presence, spatial presence, and telepresence and suggested various definitions since the mid-90s (Lee, 2004). One major goal of this work is an attempt to provide some clarity of common IGA terms within the VR context as consumer experience VR IGA for the first time in 2021 in order to enhance successful communication among scholars. Topical areas of *congruity* of the IGA, *interactivity* of the IGA, *intrusiveness* of the IGA, *realism* of the experience, *telepresence*, *brand awareness*, and *attitude* toward the IGA are unraveled within the literature. *Congruity* was identified as the centralized variable of the VR IGA congruity framework based on the topical VR context with IGA referring to the compatibility, agreement, or harmony between the elements of the game and of the VR advertisement. Two main contributions of this article are the development of a *VR In-Game Advertising Congruity Framework* (see **Figure 1**) and a proper *telepresence* definition through review of the literature with a VR active participant context.

It is important to note that augmented reality (AR), digital overlay on top of a real-life first person view, often goes hand in hand with VR discussions (i.e., AR/VR) and that this article focuses solely on VR technology and research opportunities for VR marketing exploration. VR uses computing technology but its technical properties far exceed those of a computer, giving it potentially superior applications in many fields. As a medium of work and entertainment, VR (like the television and the computer, powered by the Internet) has great potential as a sport marketing medium that brings advertisers in contact with target "eye balls," only VR is more interactive and more immersive.

Just like advertisers have targeted sport video games as an outlet for showcasing their products and services, VR holds even more promises, only if advertisers can get assurance that they are properly and adequately engaging their target audience. Brand awareness is therefore a key goal that advertisers want to achieve in product placement (Karrh et al., 2003), which in the case of VR is through IGA. In addition to providing greater clarity to the concept of IGA within VR, this study leverages on the state achieved by the participant to analyze the VR user's *attitude* toward the IGA with a view toward proposing and contributing effective evaluation of interactive marketing initiatives within VR game environments. This improved knowledge of the participant experience, within the VR gaming environment, aims to assist sport marketers in making informed IGA development decisions through strategic choice that not only enhances brand awareness, but leaves participants with a favorable attitude toward the IGA to increase sales activation.

LITERATURE REVIEW

In this study, a sport *VR In-Game Advertising Congruity Framework* is developed and proposed based on an extensive review of literature to guide researchers and marketers in the sport VR gaming industry (see **Figure 1**). Each variable of this conceptual framework is developed and supported within the literature review below for future empirical research lines and practical marketer application. This research team believes that insufficient attention has been dedicated to the relationship between sport video games along with sport consumer behavior and this is especially evident in the sport VR video game setting. This is despite the fact that the sport video game industry is a growing, multi-billion dollar industry with significant recent growth in the sport VR area (Hong and Magnusen, 2017). For instance, the most popular sport video game in the world, FIFA, generated over $1.6 billion in revenue for EA Sports in the 2020 and this accounts for over 25% of the total revenue for the company (Murphy, 2021). The majority of this revenue came from FIFA Ultimate Team and a FIFA VR game for PlayStation 5 that has been released after years of development. Consequently, a sport-related VR gaming environment is utilized to discuss the variables of *congruity* of the IGA, *interactivity*, *intrusiveness*, *realism*, *telepresence*, *brand awareness*, and *attitude* toward the IGA throughout the general business and advertising literature.

Congruity of the IGA

Advertisers desire that notwithstanding the primary task the player is involved in, they may notice and remember the in-game Ad. Kim and Ko (2019) limited-capacity model of attention suggests that it may however be a challenge for players to focus equally on the game as well as on the IGA. Game players can be selectively focused (Kahneman, 1973) or more or less intensely focused (Olshavsky, 1994), and since they can be exhausted, cognitive resources would have to be freed from a primary task, in order for spare capacity to be available for a secondary task.

Congruity may influence the ease with which players are able to share attention in this way. Lee and Faber (2007) further suggest that the interplay between primary task capacity and spare capacity may further explain how product placement in games affect brand memory. Congruity in a digital media context refers to the harmony between the elements it contains. These elements include visual or verbal elements of an IGA (Heckler and Childers, 1992; an IGA and the in-game context (Moorman et al., 2007) or harmony between the Ad sponsor and the event being sponsored (De Pelsmacker et al., 2019).

The causes of the perceived congruity can be intrinsic to the game, a property of the IGA, or in the user. Congruity may also be an aspect of the game structure, and thus can be perceived as simulation, gameplay or game narrative (Verberckmoes et al., 2016). IGA congruity may also be *thematic*—harmony between the game elements and the IGA (Lee and Faber, 2007), such as displaying an IGA of a sport related brand inside a sport VR game; advertising an energy drink within a space game, where the player's need for virtual energy may be a cue to the physical body's need for energy from an energy drink.

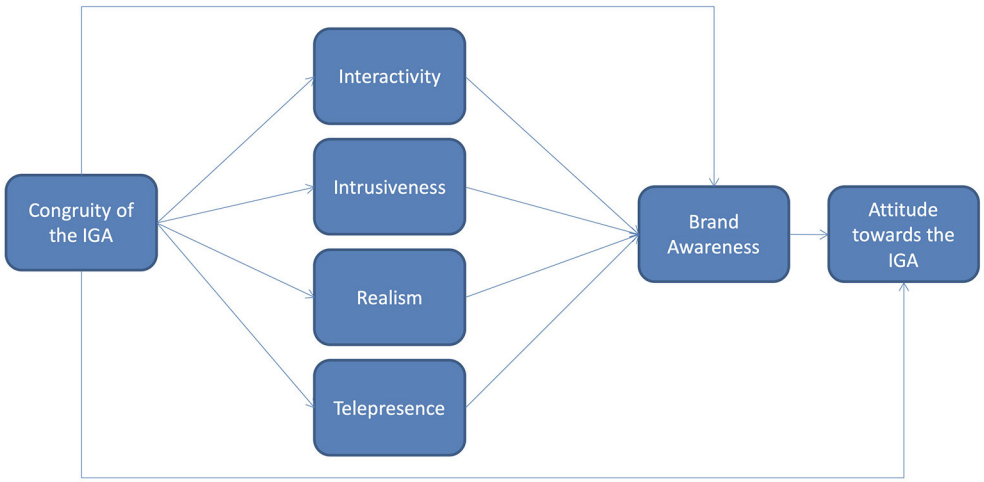

FIGURE 1 | VR in-game advertising congruity framework.

There is research suggesting that congruent information is better remembered than incongruent ones (Lambert, 1980; Moorman et al., 2007), the argument being that when people encounter new information, they try to match it with pre-existing schema. If the two information sets match, the new one would be absorbed into the old schema and thus be more easily remembered.

Other authors argue the contrary: that incongruent information is more likely to be remembered, because not matching with pre-existing information or schema, they tend to stand out, making them more easily remembered (Heckler and Childers, 1992; Russell, 2002; Dimofte et al., 2011). Despite the differences, the mechanism of effect on the memory seem to be based on both the degree of congruity and the amount of cognitive processing resources available to the individual.

We suggest that the same mechanism may explain the effect of IGA within VR on brand memory and awareness. What is at issue here though is the effect that this attention dispersal might have on the player based on their perception of harmony in the game play experience, and hence perceptions of congruity within the VR environment. Positive gameplay experience such as in a low cognitive load, aesthetic pleasure derived from a good graphics design, the absence of vestibular disturbances like motion sickness, would contribute to a mental, affective, and physical perception of congruence by the player.

Interactivity of the IGA

Interactivity is the level to which users can change the form and content of a mediated environment in real time (Steuer, 1992). Interactivity in the context of VR video games is how actively involved the player is in the activities in and outcome of the interaction. They are thus able to modify their in-game experience and change the course of the game. For instance, a player in a VR auto racing game may choose a car with specific attributes such as a higher top speed, but slower acceleration; choices that can change their playing experience (Herrewijn and Poels, 2014). IGA marketers can also take advantage of the possibilities and expectations of interactivity in VR to have players be more actively involved with their ads, which can be made a part of the game play experience (Nelson et al., 2004; Lee and Faber, 2007; Lee et al., 2014). For example, a player may be able to customize their in-game experience within a football game by picking a branded uniform for their team or a player in a NASCAR themed racing game, may be able to virtually drink a Monster Energy drink to enhance their in-game focus (Pelsmacker et al., 2019).

Previous research has demonstrated that this IGA brand interaction typically leads to positive outcomes for brands and game developers as users want to play games with interactive advertising more often and the user may exhibit a higher level of brand awareness than players exposed to passive, non-interactive IGA (Wu and Liu, 2007; Wu et al., 2008; Pelsmacker et al., 2019). Papadopoulos (2020) found that VR gamers had a higher level of recognition of both familiar and unfamiliar brands when they had brand interactions with a VR environment. In short, participant interactivity with the IGA has enhanced brand awareness as opposed to lower level of brand awareness for participants merely "viewing" or being "exposed" to the IGA.

Research has also shown interactivity to be a multidimensional construct. There is as yet little consensus in the literature regarding the dimensions of interactivity as it relates to IGA (Steuer, 1992; Gao et al., 2009). Liu and Shrum (2002) identified three dimensions of interactivity related to advertising including active control, two-way communication, and synchronicity. These three dimensions of interactivity have been included in multiple mobile and VR video game studies and Gao et al. (2009) added connectedness, playfulness, and interpersonal communication as additional dimensions of interactivity related to mobile video game IGA.

Intrusiveness of the IGA

According to previous research, a non-congruent IGA is likely to be intrusive. An intrusive IGA will augment the experience of incongruence, which produces an outcome that increases the likelihood of the IGA being noticed, stored in memory and recalled. Intrusiveness is defined as "the degree to which advertisements in a media vehicle interrupt the flow of an editorial unit" (Ha, 1996, p. 77). Editorial units in the digital media context should be broadly defined to include all media types including VR sport games.

We define intrusiveness in the context of VR video games as the degree to which advertisements embedded in the game do not conform with the digital medium's reality and/or impact the participant's VR experience. For instance, a player in a VR soccer game may expect to see advertisements embedded around the arena matching the real-world arena. However, the player may not expect there to be additional advertisements in non-traditional places such as on the goal posts and may place virtual blame on the IGA for the intrusive experience. With the unrestricted nature of VR game environments providing an unparalleled amount of advertising inventory, advertisers have an opportunity to push the envelope while not incurring intrusiveness "that occurs when an audience's cognitive processes are interrupted" (Li et al., 2002, p. 39). As such, enhanced brand awareness and recall of an intrusive IGA may produce a negative attitude toward the IGA resulting in decreased purchase intentions and actual purchase.

Marketers must be cognizant of new VR advertising inventory, but be wary of the temporal, visual, and flow characteristics of advertisements that consumers find intrusive so that negative responses are minimized (Riedel et al., 2018). For example, it would be realistic in a VR basketball game to have the participant's players within the game experience fatigue due to time between whistles and hydration. This presents an opportunity for advertisers to activate potential sponsors such as Gatorade where the participant has a chance to enhance their player's strength during timeouts by giving them Gatorade instead of water. However, this brand activation comes with a price and may be considered intrusive if not properly embedded or if this enhanced stamina is only available if you watch a 10 s commercial. It is worth noting that Poels et al. (2013) found a positive relationship between game players and their attitude toward IGA intrusiveness based on IGA context authenticity. As such in this context, we thus observe a parallel between intrusiveness and a lack of congruity. That which is incongruous can be so because it is intrusive. Likewise, because it is intrusive, the end result would be incongruity.

Realism of the Experience

IGAs, congruence in function, lifestyle, image or advertising, add to the realism of the game experience. Due to a natural harmony of components of the IGA and the game environment, the senses are made to believe that the VR experience is real, rather than simulated. Realism is the element of VR media that receives the most attention, but is comparatively limited in empirical research. With realism being the driving industry force behind VR game development and advertiser activation, perceived realism should be a key focus as it can influence mental processing of media messages, attitudes and behavior, in some cases intensifying effects (Potter, 1988).

Krcmar et al. (2011) found that video game realism correlates with attention retention outcomes. As such, integrated VR advertisements with improved graphics and enhanced graphical realism may be more salient to players and thus, lead to more identification, and a greater sense of being "in" the game experience (Tamborini, 2000). For example, a participant playing a VR basketball game in a crystal-clear VR environment, should see a realistic in-game advertising experience complete with current jersey sponsors and in-arena sponsor signs. More specifically, a gamer playing an NBA VR game with the Denver Nuggets team should see Western Union prominently placed on the player's jerseys as this is current sponsor of this team at time of writing. Gamers demand realism in their gaming experience and this sense of realism may have a significant impact on the brand awareness of sponsoring companies.

Authenticity has also been found to impact participants' perceptions of game play realism (Malliet, 2006). Hall (2003) stated that events or behaviors are defined as plausible when they have "the potential to occur in the real world" (p. 629). Tavinor (2019) found that participants' sense of being within the world, the realistic appearance of the world's environments, and the feeling of joy, anxiety, and fear provoked by the events depicted, all make for a greater impression in VR. As such, sport VR game advertisers must place importance on exposing participants to a higher degree of visual realism, as visual realism experience has been correlated to a stronger sensation of presence (Hvass et al., 2017).

Telepresence

Telepresence is a term derived from presence and it refers to "the mediated perception of an environment" whereas presence is "the natural perception of an immediate physical environment" (Steuer, 1992, p. 6). That is, contrary to the experience of "being here," telepresence is the experience of "being there" or being in parallel space through a specific computer-mediate vehicle (Faiola et al., 2013). This definition has guided a stream of studies as researchers have adopted telepresence within their work in the fields of VR, marketing communication, web uses, and consumer behavior (e.g., Klein, 2003; Nah et al., 2011; Hyun and O'Keefe, 2012; Kim and Ko, 2019).

A conceptual study of Lombard and Ditton (1997) on presence has guided several presence and telepresence research studies. They defined presence as "the perceptual illusion of non-mediation" as the same concept as telepresence. That is, when the individual feels a sense of presence, the individual does not perceive or acknowledge the existence of a medium in his/her communication environment and responds as he/she would if the medium were not there in a form of illusion of non-mediation. They conceptualized presence using six aspects, social richness, realism, transportation, immersion, social actor within medium, and medium as social actor. This multi-dimensional view on presence has provided a conceptual foundation for telepresence studies and now needs clarification for VR adoption.

When applying Lombard and Ditton's (1997) conceptualization of presence, researchers have defined telepresence with a focus on a different dimension (e.g., transportation, immersion, etc.) or used different subscales to reflect their contexts. Lombard and Ditton argued that among the aspects of presence, transportation has the longest history and has been "often used in discussions of VR, which takes users to virtual environment and leads to the suspension of disbelief that they are in a world other than where their real bodies are located" (Slater and Usoh, 1993, p. 222). For this reason, the transportation aspect has taken a central role when defining telepresence (e.g., Held and Durlach, 1992; Biocca and Levy, 1995; Steuer, 1995).

As various media technologies have advanced, so has the level of immersion. Therefore, several researchers have stressed *immersion* as a dimension of telepresence. Mollen and Wilson (2010) proposed that telepresence is characterized by cognitive and sensory arousal, control, and immersion. In their study, immersion referred to perceiving oneself to be steeped in and interacting with an environment that sustains a continuous stream of stimuli and experiences in their conceptual work. Furthermore, some researchers even have used telepresence and immersion interchangeably (e.g., McGloin et al., 2011, 2013; Mcgloin et al., 2015; Nelson et al., 2013), furthering the need for a proper VR-based definition of telepresence. In a game-based learning study, Faiola et al. (2013) highlighted the role of telepresence to enhance a user's sense of being totally immersed in a virtual space. They suggested that virtual world users often feel completely immersed in the interactivity of a game, losing their sense of time, while feeling a heightened sense of pleasure, or what has been considered the gamers' optimal experience.

Although the work of Steuer (1992), Kim and Biocca (1997), and Lombard and Ditton (1997) have primarily guided telepresence research, it is critical to revisit how to define telepresence in the head mounted display (HMD) VR gaming setting due to its fast technological advancement, growing market demand, and its applicability in various areas past VR sport games, such as training, entertainment, education, health treatment, etc. Previous studies have focused on different aspects of telepresence in line with Lombard and Ditton's (1997) work, but this inconsistency has caused substantial confusion to researchers. Consequently, we need to reconsider the definition of telepresence that can be particularly applied to the HMD VR context.

When defining telepresence in the application of HMD VR, we need to pay attention to the notion that "being there" as a spectator is not the same as "being there" as an actor (Kim and Biocca, 1997; Klein, 2003; Nelson et al., 2013). In the current upward trend of highly interactive media, VR gaming is one of the most relevant areas that require close interactions between technology and users to optimize gaming experiences. It is apparent that telepresence plays a significant role affecting sport gaming experiences, and telepresence deserves a great amount of attention from both researchers and practitioners to benefit consumers, the industries, and the overall body of business knowledge.

As such, the following clarifying VR definition has been developed through the literature to concisely guide future research. In the context of HMD VR, telepresence is defined as a participant being present within a parallel continuous streaming digital space as if the participant was actually a part of the digital space. We highlight the active role of VR sport gamers because of users' increasing level of autonomy in the VR environment due to the advancing VR technology in our definition. This actor-focused definition is grounded in Lee's (2004) presence theory, in which presence was defined as "a psychological state in which virtuality of experience is unnoticed" (p. 32). Our definition can help researchers further examine telepresence as a predictor of brand awareness in the VR gaming setting.

According to Cummings and Bailenson (2015), individuals may more likely perceive the virtual environment as a plausible space and themselves as located within it if spatial cues in the virtual environment have a logical consistency. Therefore, it is likely that individuals feel as if they are actually playing their sport in a stadium if the IGA is highly congruent with that sport during game play. For example, a Cleveland Cavaliers' fan who plays an NBA-themed VR game may feel as if he/she played basketball in Rocket Mortgage FieldHouse when he/she was surrounded by various Gatorade signage's in the virtual arena. Additionally, Bae et al. (2020) found that the characteristics of mixed reality, which represent presence, at cultural and artistic visitor attractions positively affect brand awareness. This suggests that gamers may recognize an IGA brand further when they feel as if they were in the gaming setting.

Brand Awareness

Brand awareness has long been known as a measure of advertising effectiveness and predictor of future sales in a variety of settings (Aaker and Brown, 1972; Cornwell and Maignan, 1998). Brand awareness has been researched extensively in the sport sponsorship context and the main measures typically include consumer recall and recognition. Recall is typically unaided and researchers ask consumers to identify the advertisers from a website, event, or a video game without giving them further information. For instance, a researcher may ask a consumer who recently played a sport VR video game to identify all of the advertisers they saw during the course of playing the game in an open-ended format. Recognition typically requires consumers to identify official advertisers in a multiple-choice format from a list of actual advertisers and fake advertisers. For example, a researcher may ask study participants to identify all of the official advertisers after playing a sport video game from a list of both official advertisers and non-advertisers (Pham, 1992; Tripodi, 2001; Tripodi et al., 2003). While early advertising and sport sponsorship research has extensively investigated brand awareness as a measurement of advertising effectiveness, more recent research has focused on brand awareness as a measure of IGA effectiveness in sport video games (Cianfrone et al., 2008).

Initial IGA effectiveness studies utilizing brand awareness were first related to digital video games on the computer and gaming console platforms with more recent research focusing on mobile and VR games (Nelson, 2002; Cianfrone et al., 2008; Herrewijn and Poels, 2014; Wu et al., 2018). VR games and

specifically sport VR games provide a highly interactive virtual advertising platform for advertisers to showcase their brands with IGA. As VR technology has improved, advertisers have been able to fully engage potential customers by increasing the interactivity of their embedded ads. For example, an advertiser in a basketball VR game may offer gamers the ability to change their branded shoes to a different model/color that has varying performance attributes. One type of basketball shoes may increase a player's speed while another type of shoes may increase a player's jumping ability and if the gamer is immersed in the virtual basketball world, they may physically feel these attributes during gameplay. This type of advertising experience is unique to VR games and advertising effectiveness research within VR and mobile gaming areas have shown a direct relationship between interactivity and brand awareness (Gao et al., 2009; Lee et al., 2014; Wu et al., 2018).

Both Cianfrone and Zhang (2013) and Kim et al. (2008), are seminal studies on the consumptive behaviors of sport video gamers and their relationship to consumer behavior of IGA. The researchers demonstrated that sport video game sponsorships/IGA were extremely effective in improving purchase intentions and this was especially the case for heavy gamers and sport consumers and those with a previous interest in the sponsoring brand. For instance, if a gamer playing a soccer video game like FIFA was already a loyal Apple consumer, Apple could potentially increase consumer purchase intentions with strategically placed IGA in the game. With that being said, while there is a good bit of research related to the effects of IGA on brand awareness in the traditional sport video game setting it appears that further investigation of how IGA influences brand awareness in the sport VR video game setting is warranted. Additionally, it may be important to examine VR gamer's attitudes toward the IGA embedded in games and previous brand loyalties. Similar to the issue of too much advertising at a live sports event, there is the potential for this negative effect with too much IGA in VR sport video games.

Attitude Toward the IGA

Studies suggest that there is an increase in positive consumer attitude toward advertised brands when the IGA is congruent with the video game content (Lee and Faber, 2007; Chang et al., 2010). Since the IGA represents the brand being advertised, a positive attitude toward the IGA should translate to the same toward the brand, and vice versa. How a player feels about an IGA depends a lot on the nature of the in-game interaction and whether it is favorable or not. This too depends on whether the IGA enhances or impedes the gaming experience, the primary motivation for engaging with the VR medium, in this case.

Other factors that can affect the attitude toward VR IGA are perceived congruity of the IGA, perceived realism of the game play, and perceived intrusiveness of the IGA. Verberckmoes et al. (2016) showed that IGA congruity decreased perceived intrusiveness and increased realism, both of which contribute to a positive attitude toward the IGA. Contrary to this, other authors show that IGA that seem out of place with respect to other game environmental characteristics get noticed more, and hence are better recalled, suggesting benefits for incongruity (Verberckmoes et al., 2016). Advertisers want customers to notice the brand, like it, and then take action toward sustained engagement, ending in purchase for products. Incongruent IGA may upset the player, and since brand affinity is thus a goal, beyond awareness, perhaps as Lewis and Porter (2010) suggest a moderately congruent IGA may serve to both increase awareness and keep affinity positive.

DISCUSSION

Intrusiveness and Attitude Toward the IGA

Two arguments may be presented following this comment: that experienced video game players, by being able to deliberately block out IGA, demonstrated that they were aware (at least momentarily) of the IGAs. One is only able to deliberately block out what they are aware of at that given moment in time. This should lead to great recall and recognition, but Lee and Faber (2007) argued the contrary. An alternative argument would be that the players are used to the game play and its environment containing the IGA (due to repeated practice). The participant players are thus able to block out IGAs, not because of an active awareness, but rather an active awareness of the game and a total lack of attention to anything not considered a part of the game. In either case, it is unlikely that the player would have a positive attitude toward this intrusive IGA in standard or VR game play.

Inversely, functional congruity occurs when the product category of the IGA is an essential element of game play (Gwinner and Eaton, 1999). This type of IGA may thus be tolerated and be even welcomed by participant players. The characteristic of interactivity of the IGA should be acceptable based on the same criteria as intrusiveness, only to the extent that it is functionally congruent. This should in turn lead to a harmonious game experience that may contribute to a positive participant experience, ultimately leading to an impactful attitude toward the IGA within an immersive VR sport gaming environment.

Where IGA intrusiveness and interactivity contribute to both a telepresence along with realism, and ultimately a more pleasurable game play experience, the attitude toward the IGA is expected to be positive. Functional congruity should help to bring this result because, while advertisers may be achieving brand promotion objectives through the IGA, they would simultaneously be contributing to the primary goal of gameplay. In short, with intrusiveness and attitude toward the IGA aligned the IGA would produce positive marketing outcomes, especially in sport VR experiences where advertisement inventory is maximized in real life.

Interactivity Dimensions

Connectedness builds off of the Ha and James (1998) research and refers to the feeling of being linked to the product and company outside of the mobile or VR environments. Playfulness emphasizes entertainment and the inner joy experienced by the player of the mobile or VR game and is the first dimension of interactivity that emphasizes self-communication rather than interaction with others. The final dimension of interactivity is interpersonal communication, which refers to the degree to which the media platform allows users to communicate in

a mediated, interactive environment. Additionally, researchers believe that improvement in technology such as VR headsets and improved graphics can significantly improve and enhance interpersonal communication. Regardless of the ongoing dissent related to the definition and measurement of interactivity in VR games, researchers agree that interactivity can lead to both a significant improvement in attitude toward an advertising brand and brand awareness of the IGA (Gao et al., 2009).

Being able to manipulate or change in-game objects is a key part of the interactivity of immersive VR sport experiences. An IGA can be embedded on an object with which the user interacts, as long as the IGA is thematically congruent with the object. An example would be a drink label (IGA) imprinted on an in-game drink bottle, such as Gatorade, as it will not be surprising that a drink bottle has a label. Interactivity in the sport game would require the user to hold, touch or change the object to achieve hydration.

Interactivity introduces dynamism that breaks the monotony of the normal, thus calling the user's attention. Following the argument that incongruent IGA's receive superior cognitive attention, it is therefore expected that the more interactive the IGA, the more incongruent, and hence the greater the likelihood that the user will interact with the object bearing the IGA, and finally, the greater the chance that the IGA will be remembered. In order to take advantage of the interactivity in this Gatorade example, the user would have to pick up the bottle. But what if the user, in the case of the bottle, does not want to drink? Offering them incentives during game play might lead them to pick up the bottle (interactive), what kind of incentive would they be offered if it does not contribute to the game play objective? Having players move aside embedded IGA objects could be regarded as interactive play that contributes to the game objective, to the extent that removing the barrier allows them to proceed within game play. Further IGA research is needed to understand how much cognitive involvement compares in this "negative-engagement" (remove obstacle) and a positive-engagement such as picking up to use within an immersive VR environment.

Additionally, De Pelsmacker et al. (2019) argues that interactivity of the IGA will distract from the game play. Li (2015) found domain experts who believe interactivity is neutral, and that what is important is thematic congruity. According to Li (2015), there would be no distractions when the quality of game design is good enough to achieve thematic congruity between IGA and the game. The limited-capacity model of attention (Lee and Faber, 2007) suggests that VR game players have limited cognitive resources, which they would prefer to deploy in the primary motive for playing the game, leisure. Besides subjective affective feelings, successful completion of VR in-game challenges may be confirmed by the attainment of high game scores. As Lee and Faber (2007) suggested, the more experienced players become, the more they learn to block out IGA, which they would regard as extraneous information toward the sport competition objective. In the end, IGA recall and recognition are likely to be low even in an immersive VR environment.

This research team recommends to differentiate between IGA that is designed to be interactive by the game designer, and whether or not it is engaged in by the user. This would be the case of those IGAs with dynamism of mobility, but without having anything to do with game play. From the advertiser's point of view, such IGAs would be more noticeable. However, since their interactivity is not a result of user-initiated actions, it may result in a lack of congruity, since it is an event outside normal game play or has a lack of congruity with the sport competition. Thus, advertiser generated IGAs might result in incongruity, and may lead to an eventual negative attitude toward the IGA.

Implications and Future Research

This paper advances the VR sport marketing research discussion within the literature and provides a unique IGA congruity conceptual framework (see **Figure 1**) that can be tested in subsequent studies. Grounded in both the VR and sport advertising bodies of literature, this study attempts to address several emerging issues in the VR landscape. Additionally, as VR gaming becomes more affordable and accessible there will be significantly more opportunities for IGA within VR sport game development following the 2021 Oculus VR IGA beta testing. Consequently, the importance of studying the effectiveness of IGA in the VR gaming setting will become increasingly important. The *VR In-Game Advertising Congruity Framework* developed through a comprehensive review of literature will serve as a blueprint for researchers to further investigate VR IGA effectiveness in a variety of business settings. The theoretical framework created in this study builds off of the Pelsmacker et al. (2019) framework with inclusion of telepresence and brand awareness. The researchers also utilized seminal studies related to traditional sport video game consumer behavior to verify that this framework fits appropriately in a sport specific setting within a VR context.

A secondary, but very important theoretical implication of this study is a comprehensive review of the definition of telepresence, which is key to understanding the effects of IGA in VR games. While researchers have debated the specific definition of telepresence for decades now, the researchers in this study focused specifically on the interactivity aspect of telepresence within VR. In the context of IGA within VR gaming, this involves a feeling that the participant is actually in the digital space and the influence of telepresence on brand awareness warrants further investigation (Faiola et al., 2013; Herrewijn and Poels, 2014). Again, in the context of HMD VR, this research team defines telepresence through the literature as a participant being present within a parallel continuous streaming digital space as if the participant was actually a part of the digital space. As the VR sport gaming experience continues to improve, researchers will have additional opportunities to examine telepresence and how we should look at IGA within the VR gaming environment space under this cleaned definition.

In addition to the effect of telepresence on brand awareness, the conceptual framework proposed in this study (see **Figure 1**) also further examines the effect of the IGA's congruity on brand awareness. Lee and Faber (2007) suggested four dimensions of congruity when considering the relationship between the product category of the embedded IGA and the content of the game, within which it is embedded: (1) Functional congruity is when the advertised product category

is used in the game. (2) Life congruity is when both the product category and the game content are designed for the sociodemographic group, while (3) image congruity is when the image of both the product category of the IGA match the same of the game focus. Finally, (4) advertising congruity is when the IGA product category is appropriate for the game context.

Some authors are of the opinion that congruency between in-game elements produces a superior impact on memory (Lambert, 1980; Shamdasani et al., 2001; Moorman et al., 2007; Rodgers, 2013), especially when people have a pre-existing mental schema against which they compare new information and experiences. A match between the new information and existing schema, where the former is absorbed by the latter results in a great recall of the congruent information. The aforementioned authors found that incongruent information has a comparatively inferior effect on memory to congruent information, which suggest negative brand awareness within sport VR games.

Others argue that incongruent information has a superior effect on the memory, because the novelty and the uniqueness of the out-of-place information make them noticeable (Heckler and Childers, 1992; Forehand et al., 2002; Russell, 2002; Dimofte et al., 2011). It is in the attempt to make sense of the incongruous that the cognition becomes more engaged, and thus make it easy to recall (Srull and Wyer, 1979; Mandler and Shebo, 1982). Lee and Faber (2007) believed that neither of the two above (congruency or incongruency *per se*) is an adequate explanation for the recall ability of the memory. On the one hand, they argued, it depends on the degree of either congruity or incongruity. Higher levels are remembered more easily than low or moderate levels. On the other hand, recall, they suggested, depends on how much attentional or processing resources are left over after being dedicated to the primary task e.g., an online game. Thus, in order for memory resources to be allocated to the new information, its incongruency ought to be particularly large in order for the brain to undertake the cognitive elaboration to make sense of it. The more incongruent the brand, the greater will be the brand recall and recognition (memory). This may contradict some traditional sport sponsorship/brand awareness research where sponsor/brand fit is very important (Kim et al., 2008; Cianfrone and Zhang, 2013) and further research is needed to test the *VR In-Game Advertising Congruity Framework* in order to determine the optimum line that IGA incongruity can be pushed without resulting in a negative attitude toward the IGA within an immersive VR environment.

The level of involvement of the player within the game can also affect the impact of congruity on memory. Players who are more involved, which in VR can be operationalized by the interactivity of either the game or the IGA, will be so focused on the game that they tend to block out any information considered extraneous, in this case, an incongruous IGA. Thus, it is hypothesized for future research that more experienced VR gamers should exhibit lower recall than moderate or less involved VR gamers. For example, experienced VR gamers playing FIFA may have high fan identification for their selected club and be able to block out more incongruous IGA based on familiarity with the competition and immersive VR setting.

Considering the different ways in which congruity has been conceptualized will be helpful in understanding the interactions within VR, with the special characteristics of this immersive media. Lee and Faber (2007) identified some of these conceptualizations, which either relate to the IGA itself, or refer to aspects of the IGA as well as the game context. They include the relationships between the visual and the verbal elements of the IGA; the sponsor and the advertised event; the IGA and the context where it appears; the relationship between the modality (the audio and the visual placements of the IGA) and the plot.

Future research needs to empirically examine each of the variable relationships within the *VR In-Game Advertising Congruity Framework* under the VR sport gaming context. Given the multidisciplinary nature of the research framework, its examination should not be restricted to just a sport marketing context, and rather multidisciplinary VR efforts will be optimal. Although the VR gaming industry has been exponentially growing in the last few years, there is room for improvement for both hardware and software within the $7.7 billion USD industry (Wood, 2020) that is expected to reach $57.55 billion USD by 2027 (Fortune Business Insights, 2021). Multidisciplinary contribution can enhance the collective level of understanding that researchers have about human behaviors in an extensive range of contexts (Kim et al., 2008). For example, collaborations among scholars in psychology, marketing, industrial engineering, and computer software science can produce rich findings and provide a great deal of insights for both researchers and practitioners.

This *VR In-Game Advertising Congruity Framework* can be tested using various VR games, and through group difference testing such as ANOVA, in order to examine framework variable similarities across different games genres (e.g., sport, action, action-adventure, military, role-playing games, etc.). Researchers can also utilize eye tracking built into VR HMDs such as the HTC VIVE Pro Eye with Tobii analytical software on either commercially available games or games in development creating further research opportunities. For example, researchers can develop a VR basketball game that allows IGA to be embedded or excluded in a way to manipulate the level of intrusiveness. VR players can be exposed to either a highly intrusive condition or unintrusive condition while playing the game. Following the completion of the game, the participants can complete a *VR In-Game Advertising Congruity Framework* guided survey or interview on their gaming experience, which includes IGA brand awareness and attitude toward the IGA. Additionally, researchers can explore framework ANOVA relationships to eye tracking analytics measuring gamer glances on the IGA through heat maps.

Finally, from a practitioner perspective, this study aims to benefit video game developers and advertisers. The proposed *In-Game Advertising Congruity Framework* of this study and comprehensive literature review provide a basis for video game developers and advertisers to make informed decisions regarding IGA in VR video games. This work is unique as there is a paucity of research within the literature on sport video games and none to date within the VR sport game context. The *In-Game Advertising Congruity Framework* provides practitioners

and academics alike with a baseline to measure fandom with respect to irrational choice of sport consumption and if purchase behaviors extend to a VR sport gaming experience. While it is difficult to conceptualize the role of each framework variable without empirical evidence, the context and role of IGA in VR reveals a unique boundary condition of existing theoretical frameworks. Additionally, VR gamers will potentially benefit from this study through more effective IGAs that are less intrusive and offer gamers targeted advertisements related to products that they may be interested in purchasing.

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All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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