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EXPLORING MOTIVATIONS, CONSTRAINTS, AND PERCEPTIONS TOWARD
SPORT CONSUMERS' SMARTPHONE USAGE

By

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B.A. University of California Davis, 2002
M.S. Barry University, 2011
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A Dissertation
Submitted to the Faculty of the
College of Education and Human Development
in Partial Fulfillment of the Requirements
for the degree of

Doctor of Philosophy in Educational Leadership and Organizational Development

Department of Leadership, Foundations, and Human Resource Education
University of Louisville
Louisville, KY

May 2015

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A Dissertation Approved on

April, 9, 2015

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DEDICATION

This dissertation is dedicated to my family. Mom, you always believed in me no matter what I did, and that support got me this far. You taught me everything I know, and I cannot think of any other word than I love you. And Dad, I know that you are always watching over me and I will try my best to make you proud. My sister Hyun, I cannot thank you enough. Throughout my life, I always knew in my heart that you only wished the best for me and without your support I wouldn't have made it this far. You are the best sister I could ever ask for. My sister Min Jung, thank you for always standing by my side, you always made me laugh and understood my feelings when I need it the most. And my brother Min, you stood by my side every step of the way and I always appreciated your friendship, love, and support. I am always grateful to have you all in my life.

I would also like to dedicate this dissertation to my wife, Mina Cho. Mina, thank you for being the best wife a man can ask for. You have been, and always will be the joy of my heart. I will always be grateful for all your support throughout my crazy doctoral journey. Thank you for your sacrifice, I love you.

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ABSTRACT

EXPLORING MOTIVATIONS, CONSTRAINTS, AND PERCEPTIONS TOWARD SPORT CONSUMERS' SMARTPHONE USAGE

Sun J. Kang

April 9, 2015

Today's technology trend in the United States is influenced by the growing population of 182.6 million smartphone users (Statista Inc., 2015). The technology trend has also affected the sport consumption behaviors in terms of how they obtain information, share similar interests, and purchase goods in support of their fandom. The range of efforts varies depending on sport consumers' level of fandom and their technological comfort level towards using a smartphone. Thus, understanding the relationship between sport and technology provides benefits for sport managers to discover innovative ways to further engage current fans and attract new consumers using smartphones.

Considering the benefits associated with smartphone technology, the primary purpose of this study was to examine motivations, constraints, and technological perceptions toward smartphones as it relates to sport consumers' fan identification. Specifically, the study examined (a) primary communication channels (b) factors that influence users (c) factors that prevent users from consuming sport (d) smartphone-specific technological perceptions, and (d) the differences in sport consumers'

motivations, constraints, and technological perceptions to follow sport based on sex, age, and fan identification, and (e) factors that predict actual usage, all based on sport consumers' smartphone usage.

Using a cross-sectional survey design, data were collected from the tech-savvy Amazon MTurk users ($N = 372$) living in the United States. The results of this study revealed three unique factors of motivations (i.e. intrinsic, social, diversion), three factors of constraints (i.e. personal, security, technology), and two factors of technological perceptions (i.e. hedonic, utilitarian) for smartphone usage in sport context. Among these factors, intrinsic motivations, personal constraints, hedonic perceptions and utilitarian perceptions were found to significantly predict actual usage. Further analysis also revealed that sport consumers' behaviors significantly differed based on the level of fan identification (i.e. high or low). The sport consumers also identified that they connected to the official sites the most followed by sport-related apps, and social media sites. In sports they followed, NFL was ranked the highest, followed by MLB, and NCAA Football, and within these sports, they followed their favorite team the most, leagues the second, and players the third.

The result of current study provided a holistic view towards understanding sport consumption behaviors by considering motivations, constraints, and technological perceptions associated with smartphone usage. The information captured in this study is particularly useful when designing a mobile marketing campaign to better engage current fans and attract new fans. In addition, sport managers will be able to further encourage sport consumers' motivating factors, while reducing the constraining factors by considering technological perceptions of the smartphones. Furthermore, the current

study's proposed scale could be used to assess motivations, constraints, and technological perceptions associated with actual usage to reflect upon specific characteristics of the fan identification.

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CHAPTER I

INTRODUCTION

Technologies have evolved over the years to change the way we live. One of the greatest high-tech innovations over the last half century was the introduction of the Internet (Boutin, 2013). Various devices were developed providing means to connect to on-line services provided on the Internet. Today, many people are accustomed to carrying a personal device such as a smartphone, laptop, personal computer, and tablet capable of providing a collection of services for users' personal and business activities. For example, a person who owns a smartphone is able to access business documents (e.g., using the *Dropbox* smartphone application or "app"), respond to emails, and text friends while on the move. The current trends of instant access to information and the convenience of keeping track of everything on the go have attracted users to the world of smart devices. Recently, U.S. smartphone users surpassed 164.2 million people, which accounts for 68.2% of the total mobile subscribers (comScore, 2014). Smartphone users are forecasted to increase another 12% by the end of 2017 (eMarketer, 2014). Since the release of the first generation iPhone in 2007, various smart devices that connect to a network via WiFi, 3G, and 4G networks have developed to enhance user convenience. These include mobile devices such as smartphones, phablets (i.e., hybrid of a tablet and smartphone), iPads, Android tablets, and Windows tablet PCs that have embedded functions of voice and video communication, Internet browsing, and geolocation (e.g., *Google Map*). In addition

to the popularity of the smartphone, the adoption of the tablet has exceeded 100 million users in the United States (Furman, 2012).

The phenomenon of accepting advanced technology in the belief that it will add convenience to the users' life is one of the primary reasons for such rapid growth. The benefits associated with today's smart devices have unquestionably changed the way people communicate, interact, entertain, and manage their daily lives (Liu, 2012). These benefits afford greater opportunities for diverse areas, including e-commerce, tourism, hospitality, media, and entertainment. For instance, event tickets whether for theater, concerts, events, or sports can now be accessed from smart devices using the *Stubhub* app to purchase and download paperless tickets onto consumers' devices, which are scanned at the entrance of the venue. This function not only creates an easy transaction for ticket purchase, but also provides multiple options for consumers to access ticket information, presenting increased revenue opportunities.

The business opportunities and potentials of smart devices also extend to sport fans. Sport fans are a unique group of individuals who socially classify themselves as being affiliated with sports or teams. Their identity as a fan influences various aspects of sport consumption behavior as they often see themselves as a part of the sports or teams they follow (Dietz-Uhler & Lanter, 2008). Depending on the degree of their fanship, sport consumers are encouraged to utilize technology in order to further engage in fan activities. Sport fan behavior involves connecting with others who share similar interests, purchasing goods supporting their fandom, watching and attending the games, and collecting information regarding their favorite teams and sports. The degrees of involvement in such activities vary depending on the level of their fanship. For example,

individuals who highly identify themselves with a sport team will attend more games and purchase team affiliated items when compared to individuals with low identification.

Recently, Clavio and Walsh (2013) surveyed college sport fans to identify the types of media they used to access sport information and to interact with their favorite college teams. Respondents indicated they used official websites--the most among the traditional media (Web 1.0)--and mobile phone applications--the most among the nontraditional media (Web 2.0). Based on this finding, it is evident that smart devices have become an integral part of the way sport fans communicate with other sport fans, obtain sport news and information, and support their fanship by keeping up with their favorite teams. However, not all fans utilize the available functions of smartphones to consume sport. The instant connection to all communication channels could be perceived as a threat to fans who are concerned with their privacy (see Gruzd, Staves, & Wilk, 2012). For others, technical difficulties associated with today's sophisticated devices (e.g., smartphones, tablets, wearable smart devices) may cause fans to look for alternative options (i.e., computers, televisions, face-to-face communications) to follow sport. Moreover, sport fans must be willing to make the effort in order to take full advantage of the technology in hand.

The range of effort varies depending on users' comfort level towards a technology or specific device. For this reason, capturing one's perception in terms of ease of use and usefulness predicts his or her intention to adopt technology (TAM; Davis, 1989). In other words, smartphone functions must persuade sport fans to believe they are easy and useful in order for them to fully take advantage of the benefits the device has to offer. This belief then must convince fans to initiate action to fully utilize smartphone

functions, since owning a smartphone does not guarantee enhanced sport experiences. Technology is only beneficial when users make effort to make available functions fit their needs.

Statement of the Problem

The introduction of smartphones has changed the way sport fans perceive and consume sport. To accommodate the change, sport organizations have adopted ways to utilize smart technology as part of their strategies to encourage fan involvement. In recent years, they partnered with telecommunication companies (e.g., AT&T, Verizon, Sprint, T-Mobile) and mobile developers (e.g., Apple, Android) to introduce smartphone applications, mobile websites, and live streaming functions to improve the overall fan experience (Pointstreak Sports Technologies, Inc., 2012). Such services provided by personal devices affect consumer behavior and increase effectiveness in communication processes (Chun, Lee, & Kim, 2012). Concerning sport consumers in particular, developing a close and personal relationship by using the communication channels has been emphasized as part of a success strategy in the sport industry (Clavio & Walsh, 2013).

However, providing enhanced fan experience using smart technology does not satisfy all fans since individuals consume sport differently, and their consumption behaviors largely depend on the level of commitment and emotional involvement they associate with sport (Sutton, McDonald, Milne, & Cimperman, 1997). On an individual level, the degree of such association with sport reflects their identities as sport fans. A part of that identity resonates with the degree of attachment and fandom displayed in regards to a team or sport (Sutton et al., 1997). Based on their degree of fandom, which is

normally referred to as fan identification, fans will demonstrate different sport consumption behaviors. For instance, high identified fans will have a higher desire to stay closely connected to their favorite team and players when compared to low identified fans (Gray & Wert-Grey, 2012). At all levels of fandom, individuals will consume sport using various approaches to fulfill their needs.

For many years, sport fans have adopted new technologies to effectively and conveniently fulfill their needs to consume sport. Following the adoption, the ways fans perceive and connect with sport change to reflect the benefits associated with the new technologies. For example, with the adoption of social media, sport fans were able to generate content or dialogues to interact directly with sport organizations without having to wait for access or permission. The benefits of such functions are evident as the strong bonds created between the fans and organizations have been found to encourage fanship, brand loyalty, and brand power (Gladden & Funk, 2001).

Considering the benefits associated with technology and communication channels for sport fans, a careful examination of their relationship will reveal helpful information to further improve fan satisfaction. Yet little is known about the factors that influence sport fans' motivations and constraints to consume sport using their smartphones. Understanding such factors will not only capture how sport consumers choose to interact and connect with sport today, but also provide the necessary information to improve existing services to attract a larger consumer base. Furthermore, despite the unique characteristics of different fan groups reported by recent literature (Steven & Rosenberger, 2012, Grey & Wert-Gray, 2012; Hu & Tang, 2010; Wann, Grieve, Patridge, Zapalac, & Parker, 2013), there is a gap in the literature addressing the

influence of fan identification on technology and sport consumption behaviors. Therefore, this study will explore sport fans' motivations and constraints to consume sport by examining the use of smartphones as well as users' perceptions toward technology in order to bridge the gap between technology and sport consumption. This study will also capture the influence of fan identification on sport and technology consumption behavior.

Technology Consumption

Since the introduction of the electronic era, which refers to the time between 1940 and the 2010's (Brady & Elkner, 2011), researchers have focused on developing theoretical models in order to understand technology users' decision making processes (Liao, Palvia, & Chen, 2009). Although models have evolved to reflect changing technologies and the limitations of previous models, the fundamental base of its framework continues to provide meaningful information. This is possible since all technology consumption models primarily focuses on users' perception toward a technology by quantifying users' behavioral intention.

Two primary perceptions identified through review of the literature are (a) perceived ease of use and (b) perceived usefulness, which originated from the Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1975) and Technology Acceptance Model (TAM; Davis, 1989). One's perception is defined by the person's belief, and it influences the decision making processes of behavioral intention, which eventually leads to actual usage (Davis, Bagozzi, & Warshaw, 1989). In detail, perceived ease of use reflects the level of effort users assume when referring to a technology. Perceived usefulness, on the other hand, considers users' beliefs in determining whether adopting a technology will benefit their current task at hand. While the primary perceptions were able to capture the

main categories of users' acceptance behavior, limitations were identified as other possible perceptions (e.g., perceived entertainment, perceived enjoyment, perceived playfulness) emerged, suggesting the existence of other intentions that are applicable (Kim, 2011; Liang & Yeh, 2011).

In order to overcome such limitations, researchers modified TRA and TAM to report additional perceptions and beliefs that further contribute to the user's intention and usage (Kim, 2011; Liang & Yeh, 2011; Nasri & Charfeddine, 2012; Tseng, Hsu, & Chung, 2012). Additionally, the Sport Website Acceptance Model (SWAM; Hur, Ko, & Claussen, 2011a), Unified Theory of Acceptance and Use of Technology Model (UTAUT; Venkatesh, Morris, Davis, & Davis, 2003), and UTAUT 2 (Venkatesh, Thong, and Xu, 2012) were developed to further explore users' technology adoption intentions. Based on the progression of the original models' framework, it is evident that capturing users' intention is complex as their perception will change depending on multiple factors, including the function of a technology, self-perception, situation, or any others that influences users' perspective (Steven & Rosenberger, 2012).

Further review of the literature also revealed that user intentions are naturally interconnected with user motivations to consume technology. According to Davis et al. (1989), behavioral intention implies that users form an intention to perform behaviors that will positively affect them. Similarly, motivation is defined as a reason for one to act or behave in a certain way (Oxford Dictionaries, 2014). In the online consumption motivation literature, researchers identified information, social, entertainment, pass time, fanship, and economic as salient online motivations (Hur, Ko, Velacich, 2007; Seo & Green, 2008). Considering the interconnecting relationship of intention and motivations,

users who believe social media sites are useful (i.e., perceived usefulness) will use them to obtain the latest news if they are motivated by information. Therefore, when examining technology consumption behavior, the connection between motivations and intentions needs to be considered in order to understand users' decision making processes in detail.

Technology Constraints

In the field of technology, reasoning related to users' constraints are undeveloped because researchers are naturally drawn to identifying reasons for adoption. One of the ways to understand one's behavior associated with technology rejection is by observing how it occurs when change in technology takes place. The studies that have explored users' resistant behavior during the implementation of information technology (IT) in businesses focused heavily on how users perceived and evaluated the changing process (Joshi, 1991; Lapointe & Rivard, 2005; Lin, Singer, & Ha, 2010). However, various studies reported users displayed resistant behavior changes depending on the influences of their social environment (Kim & Kankanhalli, 2009). In addition, the focus of constraints shifted towards individual resistant behavior as technology evolved to accommodate users' personal, work, and leisure lifestyles (Karlson, Meyer, Jacobs, Johns, & Kane, 2009; Sanford & Oh, 2010; Rhoda, 2010). In other words, constraints heavily depend on the users are and their intended use of technology.

With today's sophisticated technology designed to facilitate multi-tasking and assisting various aspects of our lives (e.g., schedule, memo, communicate, photos), resistant behavior shifted to reflect the change. Recent studies detailed the connection between user intentions and negative influences of the resistant behavior, while others

introduced reasons for rejection that are separate from acceptance reasons (Chen, Liu, & Dai, 2013; Watson, McCarthy, & Rowley, 2013; Witkemper, Lim, & Waldburger, 2012). Constraints such as technical difficulties or lack of skill to use a particular technology were unique as they related to certain type of technologies that required high learning curves (Czaja & Sharit, 1998; Witkemper et al., 2012). Other studies also identified privacy concerns, disinterest, and poor quality of services as resistant factors not directly related to motivations (Gruzd et al., 2012; Qingfei, Shaobo, & Gang, 2008).

While motivations and resistance are not directly related, researchers reported the negative influence of resistant behavior towards motivations derived from the technology acceptance models (Rohm, Gao, Sultan, & Pagani, 2012; Sandford & Oh, 2010). For instance, users' negative perception toward tablets will influence them to believe the technology is not quite useful (i.e., perceived usefulness), negatively affecting the motivations. Accounting for this finding, users' motivations and resistance are not considered to have an inverse relationship, but rather influence each other directly or indirectly depending on the focus of the study or technology being examined.

Further examination of constraining factors with today's technology, Rhoda (2010) argued for different levels of users' resistant behaviors towards technology. Rather than classifying everyone into the rejecter category, he suggested resistant behavior occurs at multiple levels depending on what the medium is and the types of barriers the user experiences. For example, resistant behavior towards computers and smartphones is different since users who feel comfortable typing with a keyboard may find touching the screen to be difficult. In comparison to the motivations models' framework where studies primarily focus on user intentions, resistant behaviors are

expressed in multiple levels depending on the purpose of technology and given situations (e.g., work, personal, leisure).

Sport Consumption

Among the entertainment sources that are available, sport is considered unique as sport fans are emotionally attached to their favorite teams or sport (Smith, 1988). One of the primary reasons for such attachment derives from one's self-concept in identifying themselves as a sport fan. The identification as a fan influences their individual characteristics as well as how they associate themselves with others. Just as technology acceptors and rejecters each revealed unique behaviors, not all sport fans are alike.

Over the years, researchers have focused on identifying the similarities and differences among the fan groups in order to determine the level of engagement fans have with the team or sport (Dietz-Uhler & Lanter, 2008; Fisher & Wakefield, 1998; Gray & Wert-Gray, 2012; Wann & Branscombe, 1993). Understanding the level of fan identification is important as they are highly associated with the outcome of fan behaviors. For example, a fan who highly identifies with his or her favorite team will often show anger when his or her team loses, whereas fans who are low in the spectrum of identification will demonstrate minimum change in emotion. Fan identification levels are categorized into high, medium, and low to predict and understand fans' sport consumption behavior (Sutton et al., 1997).

There are direct and indirect ways to measure the level of one's fan identification. Direct measures focus on sport fan identification itself (Wann & Branscombe, 1993), whereas indirect measures focus on their level of connection (Trail & James, 2001) and psychological commitment to a team (Mahony, Madrigal, & Howard, 2000). Based on

the literature review, both methods were highly effective in terms of predicting sport fan behaviors. Practically, the information captured from fan identification has been used to examine various aspects of sport including, fan loyalty (Steven & Rosenberger, 2012), consumer satisfaction (Gray & Wert-Gray, 2012), purchase intention (Levin, Beasley, & Gilson, 2008), game viewing motivations (Hu & Tang, 2010; Wann, et al., 2013), parasocial interaction with athletes (Sun, 2010), and more to draw a connection between ones' level of fandom and their relationship with sport. The researchers emphasize the importance of understanding fan identification since this identification determines how they connect and consume sport.

Purpose

Therefore, the purpose of this study was to understand the relationship between sport and technology by examining sport consumers' smartphone usage. By understanding sport consumers' motivations, constraints, and perceptions toward technology, sport managers will be able to establish effective communication channels for current and new sport consumers. In addition, understanding unique fan behaviors based on fan identification will provide helpful insights for sport managers and technology developers to further encourage fan involvement using technologies. The study will (a) examine primary communication channels using smartphones, (b) determine factors that influence users to consume sport using smartphones, (c) determine factors that prevent users from consuming sport using smartphones, (d) examine technological perceptions that encourage smartphone usage, and (d) examine the differences in sport consumers' motivations, constraints, and technological perceptions to follow sport based on sex, age, and fan identification, and (e) examine factors that predict

sport fans' smartphone usage.

Research Questions

The study addressed the following eight research questions:

RQ1: What communication channels (e.g., sport-related apps, social media, mobile web browser, texting) do sport consumers utilize the most in order to follow sport using their smartphone?

RQ2: What motivational factors drive sport consumers to use their smartphones to consume sport?

RQ3: What constraining factors hinder sport consumers from using their smartphones to consume sport?

RQ4: What technological perceptions encourage users to consume sport using their smartphones?

RQ5: Are sex, age, and fan identification significantly related to a linear combination of three factors of motivations?

RQ6: Are sex, age, and fan identification significantly related to a linear combination of three factors of constraints?

RQ7: Are sex, age, and fan identification significantly related to a linear combination of two factors of technological perceptions?

RQ 8: Are sport consumers' motivations, constraints, and technological perceptions significant predictors of smartphone usage for following sport?

Study Significance

More than half of the mobile users in the U.S. own smartphones (comScore,

2014). Connecting to sport using smartphones proved to be an effective method to encourage sport consumption in various aspects of sport (Kang, Ha, Hambrick, in press). For instance, smartphones allow users to keep track of their health with fitness apps, send notifications for sport news, and compute distances for sport participants using the GPS function. In addition, major sport news outlets (e.g., ESPN, FOX) incorporated texting and tweeting content to further encourage fan interaction and dialogue around fans' instant feedback. By taking advantage of the latest technologies, the sport industry gained an edge to survive in an increasingly competitive market (Funk, Filo, Beaton, & Prichard, 2009). Despite the numerous benefits technologies offer, studies concerning sport fans and their use of latest technologies' (i.e., smartphones) functions are limited. Results from this study will contribute helpful information for researchers and practitioners examining sport consumption behavior using smartphones.

This study builds on the body of literature concerning technology consumption and sport consumption behaviors in order to bridge the gap between the two disciplines. To their credit, researchers have examined sport consumption behaviors using the Internet (Hardin, Koo, Ruihley, Dittmore, & McGreevey, 2012; Hur, Ko, & Claussen, 2011a; Hur et al., 2012; Hur, Ko, & Valacich, 2007; Hur, Ko, & Valacich, 2011b; Seo & Green, 2008), social media (Clavio & Kian, 2010; Clavio & Walsh, 2013; Hambrick & Kang, 2014; Hambrick & Mahoney, 2011; Hambrick, Simmons, Greenhalgh, & Greenwell, 2010; Witkemper, Lim, & Waldburger, 2012), fantasy sports (Dwyer & Kim, 2011), and smartphones (Ha, Kang, & Ha, in press; Kang, Ha, & Hambrick, in press). However, limitations exist with the studies as they primarily focused on reasoning why sport fans selected specific content to connect with sport. Considering today's

smartphones' capability to access the Internet, social media, and fantasy sports, it is important to understand fans' preference for actual usage of smartphones. In addition, it is critical for sport managers to recognize the importance of understanding sport fans' technology motivations and constraints associated with their level of fandom in order to satisfy the needs of the unique consumer base. The current study takes a holistic approach to address the gap by identifying underlying reasons that contribute to sport fans' adoption and resistant behavior for using smartphones to follow sport.

From a practical standpoint, sport fans and technology developers will also benefit from this information as improvements can be made to address constraints and further encourage motivations and technological perceptions. For instance, technology developers may be able to include simple instructions to assist sport fans who face technical difficulties. On the contrary, sport fans who are motivated by the entertainment aspect may be further encouraged to use smartphones by providing them with a variety of options such as live streaming, on demand sports movies, and sport radios to enjoy sports. Furthermore, understanding the different preferences formed by fan identification will help sport managers to develop appropriate strategies to satisfy different consumer needs. For example, when approaching highly identified fans who are motivated by information but experience economic constraints may be more interested in using the free communication channels (e.g., social media, website, apps, etc.) when compared to low identified fans who are motivated by curiosity factors but constrained by the security factors. By understanding today's sport consumer needs, sport managers will be able to effectively disseminate, communicate, and engage fans to enhance fans' sport media experiences.

Delimitations

According to Creswell (2011), delimitations are external issues that may threaten the ability of the researcher to generalize the findings from the sample data to other settings. Following the definition, several delimitations exist within the current study:

a. The sample chosen for this study includes only the sport fans who are smartphone users. Specifically, the sampling criteria include MTurk workers with a reputable A+ rating. Mturk workers are registered users of Amazon, Inc.'s crowdsourcing internet marketing place that allows users to participate and work for projects requiring human intelligence. While researchers reported MTurk population to accurately reflect the U.S. population (Obal, 2014), the reputable online users represent only a portion of sport fans who are smartphone consumers. Thus, the results may not be generalizable to smartphone users who are not Amazon users and others living outside of the U.S.

b. The study focuses on determining sport fans' motivations and constraints associated with smartphones. Thus, the findings may not be generalizable to other consumption behaviors (e.g., point of attachment, degree of involvement) or other mediums (e.g., tablets, phablets, notebooks).

c. This study focuses on fan identification as it relates to sport in general rather than fanship towards specific sports (e.g., golf, tennis, basketball) or teams (e.g., Los Angeles Lakers, Pittsburgh Steelers, Cincinnati Reds). Sport fans who identify with specific sports or teams may respond differently than those who identify themselves as fans of sport in general. Therefore, the findings may not be generalized to fans that only identify with specific sports or teams.

Limitations

Limitations are internal issues threatening the ability of the researcher to draw correct inferences commonly due to inadequate measures of variables, loss of participants, small sample size, errors in measurement and other data collection analysis related issues (Creswell, 2011). The current study also contained the following limitations:

a. The current study's aim is to examine motivating and constraining factors as they relate to sport fans' smartphone usage. Sport fans' technology acceptance behavior may be influenced by other factors such as gender, age, household income, level of fandom, and living location.

b. The instrument adapted for this study has demonstrated reliability and validity in previous studies. However, it is impossible to control for variables beyond the theoretical structure (i.e., extraneous variables).

c. Participants' level of fan identification with sport may be influenced by other extraneous variables such as their involvement with a sport, affiliation with a sport, or attachment to a community.

Definitions of Terms

Amazon Mechanical Turk (MTurk) – Online marketplace enabling registered users to conduct task creation, labor recruitment, compensation, and data collection with more than 100,000 active workers representing 90 different countries (Franzen, 2013).

Communication channel – Seamless stream of dialogues or instant communication between the source and receivers by using today's media such as Internet, social media, electronic notifications, and smartphone applications or “apps” (Irwin, Sutton, & McCarthy, 2008).

Fan identification – Degree of psychological and emotional connection an individual develops with a team or sport (Murrell & Dietz, 1992).

Media consumption – Usage of specified media (e.g., Internet) by a person or group to obtain and exchange information about matters of interest (Wright, 2012).

Smartphone usage – Time spent consuming sport using a smartphone to search, receive, disseminate, discuss, and share sport information as well as conducting sport activities via smartphone functions (e.g., sport-related apps, mobile browser, timer, scheduler).

Sport consumption – Intake of sport products/services/information through attending sporting events, participation in sport activities, or consumption of sports using electronic and print media such as television, newspaper, radio, and Internet.

Sport fans' technology constraints:

Time: Having limited or no free time to use technology to follow sport.

Lack of interest: Having little or no attraction or interest towards using technology to consume sport.

Skill: Restrained by not having the ability or required skill to use technology to follow sport.

Security: Restrained to have feeling of security required to safely using technology to follow sport.

Expense: Restrained by financial obligations related to using technology to consume sport.

Technology error: Limitation experienced by failing to have a technology work properly or flawlessly when consuming sport.

Sport fans' technology motivations:

Information: Motive to obtain sport information and learn about things happening in the sport industry using technology.

Social: Motive to connect and interact with other sport fans using technology.

Entertainment: Motive to enjoy sport and have fun using technology to follow sport.

Pass time: Motive to spend free time or pass time away using technology to follow sport.

Fanship: Motive to consider oneself as a fan of sports or teams for psychological, emotional, and behavioral reasons.

Economic: Motive to receive monetary incentives or save money by using technology.

Curiosity: Motive to try new functions to enhance sport experience using technology.

Media multitasking: Motive to conduct multiple tasks on one device and to use multiple devices simultaneously to follow sport.

Ease of use: Degree in which one perceives technology to be easy when connecting to sport.

Usefulness: Degree in which one perceives technology to be helpful when connecting to sport.

Technology constraints – Psychological, emotional, or behavioral stage that prevent individuals from accepting or using technology to enhance practicality of current status.

Technology consumption – Psychological, emotional, or behavioral acceptance of technology (e.g., computer, smartphone) that leads to actual usage in order to develop an efficient and optimal lifestyle.

CHAPTER II

LITERATURE REVIEW

The primary purpose of this study is to understand how consumers' technology consumption motivations, constraints and perceptions shape the way sport fans connect with their favorite sports or teams. In addition, this study examines fan identification processes in order to recognize the potential effects of fan identification on technology and sport consumption behavior. The relationship between technology, sport, and fan identification will provide further understanding of today's technology trends from a sport perspective. The following literature review is organized in the following order: (a) technology consumption, (b) technology constraint, and (c) sport consumption.

Technology Consumption

Technology is defined as “the application of scientific knowledge for practical purposes” (Oxford Dictionaries, 2014). In other words, individuals adopt technology in order to enhance the practicality of their current status. With innovation of technology, our society has moved in the direction to develop efficient and optimal ways to enjoy convenient lifestyles. For example, with the introduction of microwave, individuals were able to reduce cooking time to spare more time to accomplish other duties. As technologies became more sophisticated, convenience was not the sole reason for adopting technology. Rather, more complex reasons emerged as devices were capable of accomplishing multiple tasks to accommodate various parts of individuals' lifestyles. One of the ways to understand technology consumption behavior is to examine one's

decision making process within the scope of various theoretical frameworks. With the evolution of technology, researchers have proposed several theoretical frameworks in attempts to provide a better understanding of technology consumption behavior. This section highlights the most commonly used theories in technology, including the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), and Unified Theory of Acceptance and Use of Technology (UTAUT) in chronological order.

Theory of Reasoned Action (TRA)

First, the Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1975) provides a foundation for understanding one's decision making process in regards to technology consumption, and serves as the fundamental basis for other theories examining the same. TRA is one of the most influential theories of human behavior in social psychology (Venkatesh, et al., 2003), and predicts behavioral intention based on one's attitude and influence. TRA is commonly employed in studies that attempt to predict fundamental human behavior. The two core constructs of TRA are (a) attitude toward behavior and (b) subjective norm. Attitude toward behavior refers to "an individual's positive or negative feelings (evaluative affect) about performing the target behavior" (Fishbein & Ajzen, 1975, p. 216). This construct captures information regarding types of feelings associated with the particular behavior they perform. For example, positive feelings about a personal computer will allow users to believe that the outcome of their performance through their computer usage is positive. Subjective norm refers to "the person's perception that most people who are important to him think he should or should not perform the behavior in question" (Fishbein & Ajzen, 1975, p. 302). In other words, subjective norms capture how one feels about the perceptions significant others have regarding how he or she

should behave and act. For instance, if one's best friend was using an iPad to take notes and suggests that he or she should use iPad in class, then one would perceive using an iPad as appropriate for the task. Therefore, these two core constructs of TRA act as important determinants of an individual's intention to act (See Figure 1).

Figure 1. Theory of Reasoned Action (Fishbein & Ajzen, 1975)

The attitude toward behavior and subjective norm constructs are, however, determined by a set of beliefs (Hur et al., 2011a). According to Fishbein and Ajzen (1975), beliefs are defined as “the information he has about the object,” and individuals could have different degrees of beliefs (p. 12). Specifically, beliefs are divided into behavioral and normative beliefs. Behavioral beliefs are related to an outcome or consequences of a particular behavior. For example, sport fans may believe keeping track of their favorite team's score (behavior) shows their support for the team (outcome). While behavior beliefs focus on the consequences, normative beliefs are an individual's belief about whether a specific group or individual approves or disapproves of an individual's behavior. In a way, normative beliefs are very similar to the subjective norm construct. The major difference between the two is the fact that normative belief involves specific groups or individuals whereas subjective norm concerns people who are

important to the person who performs the behavior (Hur et al., 2011a). In other words, a person with a normative belief will comply with expectations from co-workers, colleagues, and friends, whereas a person who is concerned with subjective norms will comply with his or her significant others, family, or someone who is considered to be important to him or her.

As mentioned above, whether the person is influenced by the behavioral beliefs or normative beliefs, it greatly affects the two core constructs of attitude toward behavior and subjective norms. To validate this claim, Davis et al. (1989) applied TRA to examine students' intention to use and actual usage behaviors. The researchers examined 107 MBA students who participated and answered questionnaires regarding a word processing program called WriteOne. Students were given a one hour introduction to the software at the beginning of the semester and were able to access it on campus computer laboratories. The results of the study indicated that the attitude toward behavior and subjective norm explained 32% and 26% of the variance in intention and use, respectively.

Technology Acceptance Model (TAM)

Building upon the core constructs of TRA, the Technology Acceptance Model (TAM) was initially developed to predict users' intention to accept information technology (Davis, 1989). Specifically, the TAM attempts to answer the question of "what causes people to accept or reject information technology" (Davis, 1989, p. 320). The model focuses on two constructs: (a) perceived usefulness and (b) perceived ease of use. Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320). This

construct examines how much one views using technology to be useful. For instance, a laptop user could perceive the device as useful if he or she became more efficient by using it. Perceived ease of use is defined as “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989, p. 320). In other words, it refers to how much one perceives the technology as easy to use. For example, if people perceive the smartphone to be easy to use and believe they could learn the functions without much effort, they would more likely accept the smartphone technology in comparison to someone who perceives the smartphone to be difficult. In addition, TRA’s constructs of beliefs and attitude towards behavior were also included in the TAM model. However, Davis et al. (1989) later excluded the TRA’s attitude towards behavior construct after finding users’ attitude showed limited evidence of its mediating effect on their behavior. Therefore, the beliefs construct from TRA was the only construct retained from the TRA, and is defined as the behavioral determinants that are influenced by the perceived usefulness and perceived ease of use. In other words, if a user finds the technology to be useful and easy to use, he or she would be more likely to accept the technology--demonstrated through the subsequent behaviors. With these three core constructs, TAM focuses on how users’ perceptions towards usefulness and ease of use will contribute to beliefs that will lead to intentions and eventually technology use (See Figure 2). The TAM has been applied and modified in various studies to understand users’ intentions and perceptions towards different evolving technology usage. To date, researchers have used TAM to examine various types of technology use such as online sport consumption motivations (Hur, et al., 2011a; 2012; Hur, et al., 2011b), mobile consumption (Jiang, 2009; Jung, Perez-Mira, & Wiley-Patton, 2009; Lee, Ryu, & Kim,

2010), and information technology (Tseng et al., 2012).

Figure 2. Technology Acceptance Model (Davis, 1989)

Even with rapid changes in technology trends, TAM is still powerful in comprehensively capturing users' intention to adopt technology. Examining studies that used TAM as a framework are important as they demonstrate the extent of applicability of the model. The following empirical studies highlight how TAM is used to address users' intention to adopt today's technology and factors that influence users' perception toward their decisions. Using TAM as a theoretical framework, Jiang (2009) examined users' intention to adopt a mobile Internet service by examining undergraduate students in the southeastern United States. The researcher discovered that users' beliefs, which originally derived from TRA and quality perception of the service played a major role in affecting adoption intentions. Respondents indicated mobile users who viewed mobile Internet as a positive and effective tool were more likely to believe that using the mobile Internet service had a positive outcome. Thus, those who expressed positive views towards the quality of the technology and the beliefs that are associated with positive outcomes were more likely to adopt the innovative technology when compared to someone who did not share the same perception.

Another smartphone study examined the behaviors of mobile shoppers to

determine how TAM constructs influenced mobile users' adoption intention of mobile shopping (Aldás-Manzano, Ruiz-Mafé, & Sanz-Blas, 2009). The researchers surveyed 470 mobile users in Spain who were 14 and older, including mobile shoppers and non-mobile shoppers. Based on the results of the survey, they found that users who experienced Internet shopping prior to using a mobile phone were more likely to perceive mobile shopping as easy and useful. Users' positive perception associated with Internet shopping influenced intention to adopt a new technology to accomplish the same task. For example, an Internet shopper who enjoyed the convenience of shopping at Amazon.com would most likely associate the same feelings for the Amazon app, if they worked similarly on the Internet and their smartphone. The positive perception associated with the online shopping experience will transfer to the mobile shopping experience making the user believe that the smartphone app would also be easy and useful.

Similarly, Jung, Perez-Mira, and Wiley-Patton (2009) conducted a survey to explore user intention to use mobile TV service. Mobile TV service was chosen at the time because the device was one of the newest technologies available for early adopters. When examining TAM constructs, researchers may find that new technology mediums are ideal for a study, as TAM focuses on intention to adopt and how likely those intentions will result in actual consumption (Jung et al., 2009). Usually, adoption intentions and the chance of it leading to an actual usage are likely to be forgotten or altered when the technology has been around and used for a long time. Taking this time sensitivity into consideration, the researchers examined early adopters of mobile TV and factors affecting user intention to adopt this new technology. Using TAM as a framework, Jung et al. (2009) concluded that perceived usefulness had a direct influence on intention

as the users viewed mobile TV as part of their daily leisure activity. Based on the results, perceived ease of use and perceived usefulness were identified as important variables that significantly affected users' intention (Jung et al., 2009). In fact, the early adopters of mobile TV showed behavioral intention to use the device as long as they perceived the technology to be functionally easy and useful. However, the researchers noted that such behaviors could have resulted from the curiosity and willingness-to-try nature of early adopters. Using TAM as a framework, these studies revealed that understanding users' intention to consume technology was an important component for understanding actual usage behavior.

TRA and TAM in Technology

As TAM evolved from TRA, many researchers examined technology through the frameworks of both TRA and TAM (Kim, 2011; Liang & Yeh, 2011; Nasri & Charfeddine, 2012; Tseng et al., 2012). Recent works that employed both frameworks include studies examining information technology (IT) and the Internet, social media sites, and mobile games (Kim, 2011; Liang & Yeh, 2011; Nasri & Charfeddine, 2012; Tseng et al., 2012). These studies demonstrate how TRA and TAM can be employed and modified to measure users' intention to consume various types of new emerging technologies. Tseng, Hsu, and Chung (2012) examined acceptance of IT and the Internet by people over fifty in Taiwan. Using TRA and TAM, the researchers proposed four hypotheses that were relevant to the main constructs of TAM, perceived usefulness and perceived ease of use. They also proposed an additional fifth hypothesis based on the TRA belief construct. In combining TAM and TRA constructs, the five hypotheses examined the relationship between the TAM and TRA constructs and their effect on

acceptance in IT. The study revealed that perceived usefulness and attitude have a positive effect on intention to use the website for users over 50. The respondents indicated that they were able to accept information technology even at an older age as long as they had positive feelings towards using the technology and perceived it to be useful. Additionally, perceived usefulness and perceived ease of use had a positive effect on attitude, and perceived ease of use had a direct effect on perceived usefulness. In other words, the users' perception towards the use of technology being easy and useful is highly integrated to the point where the technology's ease of use helped to explain its perceived usefulness (Tseng et al., 2012). The study provides support for the framework of both TRA and TAM, and offers helpful insights as to how the constructs are related to one another as Davis et al. (1989) suggested.

While several of the studies above address IT adoption, the frameworks of TRA and TAM are not limited to examining these services. Many studies have employed the frameworks to examine a variety of emerging technologies. Kim (2011) extended the TRA and TAM constructs to examine users' pre-adoption intention for Cyworld (a social media site in Korea). The researcher surveyed 280 college students in Korea and conducted confirmatory factor analysis (CFA) to support the core constructs of TRA and TAM. Similar to findings of Tseng et al. (2012), the study results confirmed that perceived usefulness was a significant predictor in social media site usage intention. The respondents indicated that Cyworld is a useful tool when trying to keep in touch with friends and family. Many participants indicated that they actively use Cyworld on a daily basis as it was viewed as an effective way to stay in touch with others. Based on these studies, perceived usefulness is seen as a valid construct just as Davis (1989) had

suggested. The researcher also discovered that an additional construct driven by the TAM, perceived enjoyment, was a significant predictor for capturing Cyworld usage intention. For example, users who found Cyworld to be fun because they are able to share pictures online demonstrated high intention to use Cyworld. Finally, the TRA construct, subjective norm, was also supported as the Cyworld users were highly influenced by others who used social media sites (Kim, 2011).

Another study conducted by Nasri and Charfeddine (2012) used TAM and TRA as the conceptual frameworks to examine adoption of Facebook by Tunisian students. The purpose of the study was to examine these students' intention to adopt social media, focusing on the fact that the students are considered users from a developing country. Although the study was conducted eight years after the launching of Facebook, the students were viewed as late adopters and therefore an ideal sample to examine user intention. Their model included perceived usefulness, perceived ease of use, attitude, social norm, and intention to use Facebook as the core constructs. The study subjects were 300 Facebook users who completed a French version of the survey. The study confirmed that the TAM and TRA were applicable in predicting social media site adoption in a developing country. The researchers used structural equation modeling (SEM), and found that perceived usefulness was not a significant factor in determining users' intention to use Facebook. However, the study revealed that perceived ease of use had a significant effect on perceived usefulness towards using Facebook. In other words, the degree of ease that users perceive plays a critical role in determining how users will accept Facebook. The results also supported the TRA by reporting that attitude and social norm had the strongest effects on intention to use Facebook (Nasri & Charfeddine, 2012).

The studies conducted on social media sites such as Facebook are important because they demonstrate the applicability of TRA and TAM in new emerging technologies that are beyond information technologies.

In support of TRA and TAM's applicability to other areas, Liang and Yeh (2011) examined mobile games. The researchers augmented the frameworks to examine the moderating effect of the TRA and TAM variables to fit the "hedonic nature of mobile games" (Liang & Yeh, 2011, p. 187). For instance, mobile games are often seen as a form of entertainment where users seek pleasure and excitement by playing them. Considering differences in the nature of gaming versus other technologies, the researchers modified the frameworks of TRA and TAM and their accompanying variables to address the research questions. For example, perceived usefulness was modified to perceived playfulness to fit the purpose of the study. The findings of the study revealed that perceived ease of use and perceived playfulness explained 65.8% and 38.2% of the variance in attitude, respectively, supporting both TRA and TAM. Intentions to use the mobile games were primarily affected by attitude and perceived ease of use. On the other hand, perceived playfulness and subjective norm had no significant effect on the continuance intention to use the mobile games (Liang & Yeh, 2011). This study suggests that the frameworks of TRA and TAM could be modified and applied to other new technologies, including mobile related technologies. As mentioned above, the concept and model of the TAM was used as a framework for many research studies involving new technology to further understand users' intention to accept them.

As evidenced with the previous studies, one advantage of the models is their flexibility. Originally derived from TRA, TAM was developed to examine IT adoption in

the workplace in 1989. The above studies demonstrated TAM's capability to consider various technology mediums. The TRA and TAM, whether separate or together, are powerful tools to examine users' intention to adopt various types of technologies in all types of situations across disciplines. The core constructs of the models are capable of accommodating specific characteristics that are related to unique functions of technology (e.g., hedonic nature of online gaming). The frameworks of the models are also capable of considering other related models and variables depending on the purpose of the study. The studies also illustrated that the perceived ease of use and perceived usefulness constructs are the bases of other intentions that derives from functions of specific technologies. For example, user intentions toward technology that are geared towards social media sites (communication) are different than technology for sport games (entertainment). The studies that modified the original model to include constructs such as perceived enjoyment (Kim, 2011) and perceived playfulness (Liang & Yeh, 2011) exemplifies the differences in user intentions depending on characteristics/functions of the technologies. Thus, one's perception, belief, and attitude towards technology directs technology acceptance that lead to actual usage (see Kim, 2011; Liang & Yeh, 2011; Nasri & Charfeddine, 2012; Tseng et al., 2012).

Unified Theory of Acceptance and Use of Technology (UTAUT)

Since the development of TRA and TAM, other models such as the Theory of Planned Behavior (TPB; Ajzen, 1991), Innovation Diffusion Theory (IDT; Rogers, 1995), Combined TAM and TPB (Taylor & Todd, 1995), and TAM2 (Venkatesh & Davis, 2000) have evolved from the original frameworks of TRA and TAM. However, the listed theories and their accompanying frameworks, which included user acceptance

determinants, were criticized, since each theory captured different aspects of users' intention to adopt technology rather than a comprehensive perspective with all of the variables (Venkatesh, et al., 2003). Moreover, the lack of empirical studies testing and comparing each of these models posed limitations for researchers attempting to utilize these models for further analysis. In order to overcome these limitations, Venkatesh et al. (2003) empirically tested and compared eight prominent models that measured users' intention to adopt technology. Based on their comparisons, they reported the limitations of each model by listing the variance explained by each of the eight models. The variance in intention and use accounted for by each model ranged from 26% to as much as 60%. For instance, the variance in intention explained by TRA and TAM was 32% and 47%, respectively.

With these results, Venkatesh et al. (2003) proposed a new model called the Unified Theory of Acceptance and Use of Technology (UTAUT) model that combined seven significant constructs of the eight models (See Figure 3). The researchers theorized that four of these seven constructs would play a critical role as “direct determinants of user acceptance and usage behavior” (Venkatesh et al., 2003, p. 447). The four constructs were (a) performance expectancy, (b) effort expectancy, (c) social influence, and (d) facilitating conditions. The first construct, performance expectancy, is defined as the degree to which a user believes he or she will gain something by using the technology. For example, if the user thinks that he or she will save time by using the computer, he or she will be more likely to use the computer. The second construct, effort expectancy, is similar to perceived ease of use (TAM; Davis, 1989), and is defined as the “degree of ease associated with the use of the system” (Venkatesh et al., 2003). The variable refers

to a user's perception on how easy or difficult the technology will be perceived. The third construct, social influence, expands on the subjective norm construct from TRA. Social influence in the model is defined as how a user would perceive the views of others who believe he or she should use the system. For instance, at the workplace or at school, peer pressure or a co-worker's perception towards technology use plays a critical role in influencing others who are around them. If a co-worker continues to tell a peer that an Apple computer is the best device for the project, he or she will likely be influenced to believe Apple computers are the right device for the job. Finally, the facilitating conditions construct deals with the support system for the technology usage. The construct is defined as the "degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003, p. 453). Facilitating conditions are quite complex as they include the compatibility, job-fit, and behavior control aspects of the system use. For example, if the users believe that they could gain access to a helpline any time they face trouble, they are more likely to use the system. Also, if users believe their job requires them to use the system for work purposes, they are more likely to adopt the technology knowing the organization will provide support during the learning process. The researchers also proposed that each of these constructs will be moderated by age, gender, and experience (Venkatesh et al., 2003).

With these four core constructs, the researchers empirically validated the UTAUT and cross-validated the instrument. All four constructs were found to be direct determinants of intention to use technology. Also, the researchers determined that experience, gender, and age had significant moderating influences on the intentions. Particularly, the results revealed that the moderating effect for performance expectancy

was stronger for men and younger workers. In other words, young professionals and men in particular had high expectation towards performance of a new device (e.g., speed and memory) when compared to other demographics. In fact, when their expectations were met, the usage intention increased. The researchers also determined that moderating effect for effort expectancy was stronger for women, older workers, and workers with limited experience. For example, women, older professionals, and workers who are new to work believed adopting new technology would require an excessive amount of personal effort to learn, which in turn decreased their intention to use. Notably, social influence was also found to be stronger for women, older workers, and those with limited experience or who are required to use the technology. Furthermore, facilitating conditions on usage was moderated to be stronger for older workers with more experience. For instance, an older worker who had been working for a company for more than 15 years was more likely to adopt new technology when technical support was available. The moderating effects based on experience, gender, and age are important as people in different stages of their lives would be in different stages of their careers to influence technology acceptance behavior. Also, the gender difference in the moderating effect is important to note as it provides helpful insights into understanding the usage intentions. The UTAUT captured 70% of the variance in usage intention, explaining more than each of the eight models examined separately in this study. As a result, the proposed UTAUT model advanced previous models by providing a parsimonious model that could be used to examine emerging technologies (Venkatesh et al., 2003).

Figure 3. Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003)

UTAUT model in technology. Since the introduction of UTAUT, several studies examined different uses of technology through the lens of this framework. Recent studies that incorporated the UTAUT model explored mobile phone messaging (Ho, Hung, & Chen, 2013), digital libraries (Rahman, Jamaludin, & Mahud, 2011), mobile commerce (Qingfei, Shaobo, & Gang, 2008), and social media (Gruzd et al. 2012). The following studies illustrate how the UTAUT model could be employed to examine users' technology acceptance behavior and demonstrate its applicability to measure various types of new technologies. Ho et al. (2013) examined users' acceptance behavior towards mobile phone messaging to enhance parent-teacher interactions. The researchers determined that the lack of effective communication between the teachers and parents limited students' learning potential, and proposed mobile phone messaging as part of the solution. In order to effectively integrate the mobile phone messaging system, the researchers examined teacher intentions to adopt mobile phone messaging through the framework of UTAUT. The participants of this study were 315 primary school teachers,

and the majority of them worked for more than five years in education. The major finding of this study showed that perceived usefulness and perceived ease of use in the UTAUT model affected behavior intention. In other words, the teachers viewing mobile messaging as useful and easy to use encouraged this usage as a teacher-parent communication source. In addition, the study confirmed the TRA model by suggesting that subjective norms are important determinants to capture users' intention. For example, if implementing mobile messaging systems is viewed as normal and effective in the school system, the teachers would more likely adopt them, believing that they would encourage parent-teacher communication. Based on these results, the researchers suggested incorporating training sessions to facilitate the adoption process. These sessions would help ensure the teacher perspectives that mobile messaging systems are easy and useful to implement successfully in the school system. Additionally, they proposed providing incentives for the teachers to foster positive attitudes and further increase user intentions (Ho et al., 2013).

The UTAUT model was also employed to capture academic researchers' social media usage. Gruzdt et al. (2012) observed the increasing trend of adopting social media as a networking tool for scholarly practices. The study, through the lens of the UTAUT model, explored what social media tools scholars use and why they used them. The method chosen for this study was a qualitative approach by conducting semi-structured interviews with 51 scholars involved in various fields (e.g., computer science, library science, and information science). The researchers believed a qualitative approach was appropriate, considering the exploratory nature of the study and that no studies prior had used the UTAUT model to examine social media usage. The researchers first revealed the

top five most frequent used social media tools were wikis (e.g., Wikipedia), non-academic social networking tools (e.g., Twitter), listserv groups, blogs, and video/teleconferencing tools (e.g., YouTube, Skype). Additionally, using the UTAUT model as a theme, the researchers provided helpful insights in understanding scholars' social media usage. The researchers determined that scholars saw the social media tools as a way to find new professional connections and to keep up with existing contacts, and this finding supported the performance expectancy to positively influence intention (Gruzd et al., 2012).

However, in terms of the UTAUT effort expectancy construct, Gruzd and his colleagues (2012) expected a negative association with intention, as many scholars expressed concerns regarding privacy and fear of losing control over content posted to the social media sites. Similarly, a negative effect on the facilitating conditions construct was observed, as many respondents expressed concerns about time constraints and information overload on the social media sites. For instance, most of their educational institutions did not provide support for professors to utilize social media tools for their teaching or research purposes. With this lack of support from the university, the scholars would have to find their own ways to learn and disseminate information through the social media sites, resulting in a negative effect on the facilitating conditions construct. Furthermore, the social influence construct was determined to be important as many scholars encouraged each other to stay connected and disseminate information using social media tools. Overall, the respondents expressed positive feelings associated with social media, as the platforms provided convenient ways for scholars to collaborate and connect with other scholars. This study was significant for two reasons. First, this study

demonstrated how UTAUT could be used qualitatively when exploring emerging technologies that are relatively new to the field. Second, results from this study provide guidance towards future research to further explore the topics (Gruzdt et al., 2012).

Although the above study employed UTAUT for qualitative analysis, the UTAUT model is traditionally used for quantitative analysis. Taking the traditional approach, Rahman et al. (2011) examined users' intention to use a digital library based on the modified UTAUT model. The researchers only employed the two major constructs of UTAUT, performance expectancy and effort expectancy, and excluded the facilitating conditions and social influence constructs. The researchers replaced facilitating conditions and social influence constructs with information quality and service quality as they believed these two constructs to be more relevant and appropriate in examining digital library usage. As with the original UTAUT model, age, gender, and experience were examined for their potential moderating effects. For this study, 534 postgraduate students were surveyed from four different universities in Malaysia that had access to digital libraries. The results of this study indicated that performance expectancy, effort expectancy, and information quality were positively related to intention to use digital library. For example, if postgraduates believed that using a digital library would help them conduct research more effectively and easily, they were more likely to use the technology. Also, the more users believed information from the digital library source to be valid, relevant, and accurate, the more intention increased. However, the results also indicated that service quality was negatively related to the intention to use digital libraries. In other words, even with poor service quality, the respondents perceived digital libraries to still be better than not having access to one. In regards to moderating effects, the

researchers discovered no significant interaction for age and gender, while experience showed a moderating effect towards intention to use the digital library. There was no difference in intention to use the digital library services between female and male graduates. Also, age difference was not indicated as a moderator, meaning ways to conduct research were not significantly different for younger or older scholars. However, experience was a significant moderator, since familiarity would affect the confidence level of users who make use of a digital library system. The results of this study demonstrated that UTAUT could be modified depending on the type of technology and users being examined. Additionally, this study revealed that UTAUT results could be supported partially when constructs are modified to fit the purpose of the research (Rahman et al., 2011).

Qingfei et al. (2008) also proposed a modified UTAUT model to examine Chinese mobile commerce users. First, the researchers replaced the performance expectancy construct with utility expectancy, which involves playfulness, satisfaction, and quality of life, as this construct was deemed one of the primary characteristics of the mobile commerce technology. They also replaced facilitating conditions with convenience cost as mobile commerce is strictly related to shopping experiences that involve costs. The replacement of the construct was necessary since the existence of organizational support (facilitating conditions) was irrelevant for individual mobile shoppers. In addition, the researchers added the trust and privacy (TP) construct for the same reason relating to nature of the mobile commerce technology. Mobile users are constantly threatened by security issues that are related to trust and privacy, which in turn could discourage users from purchasing products using their mobile devices. Hence, the

TP construct was included to specifically address mobile commerce users. In regards to moderating factors, the researchers also added a Chinese culture variable, as results from a collective society might reveal different findings. The final model included the major constructs of trust and privacy, utility expectancy, effort expectancy, social influence, and convenience and cost constructs that would be moderated by user demographics and Chinese culture. Although this study did not empirically test the modified model, the researchers made a valuable contribution to future studies that would examine users' intention concerning mobile commerce technology. To a certain extent, this study also demonstrates how UTAUT could be modified to examine a specific sample (i.e., Chinese users) concerning specific technology such as mobile commerce devices (Qingfei et al., 2008).

In summary, UTAUT is continually being employed and modified to examine new technologies. As a unified model, UTAUT provides detailed insights as it includes attributes from eight individual models such as TRA and TAM. UTAUT is especially useful when attempting to comprehensively understand users' intentions, because it captures more dynamic perspectives of user intentions when compared to individual models proposed prior to the UTAUT. As demonstrated above, the UTAUT model could be examined both quantitatively and qualitatively depending on the research purposes. Furthermore, UTAUT's potential is not limited, as studies have also modified the major constructs to address specific technologies. In the future, more studies validating UTAUT model will further strengthen the validity and reliability of the model.

Extending the Unified Theory of Acceptance and Use of Technology (UTAUT 2)

Recently, Venkatesh, Thong, and Xu (2012) proposed that the UTAUT model should incorporate three additional constructs in efforts to further strengthen the existing model. The three additional constructs are (a) hedonic motivations, (b) price value, and (c) habit based on theories of previous studies (Brown & Venkatesh, 2005; Coulter & Coulter, 2007; Davis & Venkatesh, 2004). The moderating variables of age, gender, and experience were kept the same as the original model. In terms of hedonic motivations, Holbrook and Hirshman (1982) indicated that hedonic motivation plays an important role in predicting consumer behavior (as cited in Venkatesh et al., 2012). As part of the inclusion, hedonic motivations is conceptualized as perceived enjoyment and defined as “fun or pleasure derived from using a technology” (Venkatesh et al., 2012, p. 161). In other words, if users believe a technology to be fun, the users’ intention to use the technology will increase. The price value construct was also indicated to impact users decision as Zeithaml (1988) determined cost to be related with quality of service or perceived value of the product (as cited in Venkatesh et al., 2012). The price value construct is more conceptual as users would make a “cognitive tradeoff between the perceived benefits of the applications and the monetary cost for using them” (Venkatesh et al., 2012, p. 161). For example, if the cost of notebook computers were perceived as cheap when compared to the benefits received from using the computer, the price value would be positive. On the other hand, if the users feel they paid too much for the computer in comparison to the benefits they receive, the price value would be negative. The last construct, experience and habit, was deemed a significant predictor in capturing user intention (Kim & Malhotra, 2005; Limayem, Hirt, & Cheung, 2007). The previous studies found that experience impacted habit on technology use. For example, a driver

exposed to a navigation system would habitually turn on the system even when he or she is familiar with the road. Based on this finding, Venkatesh et al. (2012) adopted the habit construct based on how experience forms individual habits depending on the extent of familiarity and interaction with the target technology.

After proposing an updated model with an additional three constructs, Venkatesh et al. (2012) empirically tested the model by examining mobile Internet users in Hong Kong. The data for the UTAUT 2 were analyzed using partial least squares (PLS), which indicated significant improvement in variance explained compared to the original model. The variance explained in behavior intention improved from 56% to 74%, and technology use improved from 40% to 52%, respectively. The study results revealed that hedonic motivations, price value, and habit were important additions to the original model. Specifically, hedonic motivation was a critical determinant of behavior in a non-organizational setting. For instance, a mobile user who plays an *Angry Birds* game on his or her phone would perceive the technology to be enjoyable for personal use rather than for organizational purposes. For the price value variable, the results indicated that price value had a significant effect depending on the moderating variables (age, gender, experience). The results suggested that perception of price value differs depending on the social role, as it contributed to moderating effects. For example, the person who provides for the family, whether they are male or female, would have different perceptions about the monetary value of the technology being used. Depending on who the users were, price value variable played a critical role in determining the user intention to consume technology. Lastly, habit was also found to have a significant impact on personal technology use. For instance, users who habitually use push functions on iPhones to

receive news would more likely use other devices that included push functions (Venkatesh et al., 2012).

As indicated in the results of this study, hedonic motivations, price value, and habit were all examined to be important additional predictors for understanding user intention (Venkatesh et al., 2012). Theoretically, the additional constructs comprehensively extended the previous existing body of literature that had suggested hedonic motivations, price value, and habit to be important predictors of intention (Brown & Venkatesh, 2005; Coulter & Coulter, 2007; Davis & Venkatesh, 2004; Holbrook & Hirshman, 1982). Furthermore, UTAUT 2 is suggested as a better model since more variance accounted for by the behavioral intention and technology use was greater than the original UTAUT model (Venkatesh et al., 2012). Once the model is employed in the future studies, the validity and reliability of the instrument and the model will be significantly strengthened.

Overall, this section provided the theoretical frameworks of models that are used to examine users' decision making process to measure the degree of their intention to adopt technologies. Since the introduction of technology in our society, researchers have found various approaches to identify what elements led to the adoption of technology in users' lives. As mentioned previously, Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT) are the main theories that examine how users' perception affects their intention to consume technology. With various studies using TAM and TRA as a framework, the models were proven to be valid and reliable ways to explore users' intention to adopt technology. Additionally, through empirical evidence, TAM and TRA demonstrated their

flexibility to adopt and modify existing and added variables to address the research purposes. While powerful in examining users' intentions, TRA and TAM were observed to be limiting as the models' core variables portrayed limited focus pertained to specific beliefs and perceptions. To overcome such barriers, UTAUT and UTAUT 2 were introduced to comprehensively examine users' acceptance and behavior towards technology. As relatively new models in technology, UTAUT and UTAUT 2 are continuously being examined today to provide concrete evidence to support their applicability.

Technology Constraints

The theoretical frameworks mentioned above examined users' intentions and perceptions that are relevant to technology consumption. However, a user's likelihood of accepting the technology only shows one side of the user's technology consumption. In order to fully comprehend user behavior related to technology, both intentions and constraints must be examined comprehensively. Individuals' reasons to resist technology could largely vary depending on the outcome of desired goals (Bagozzi & Lee, 1999). Fewer researchers have conducted studies examining the complex nature of technology constraints (Joshi, 1991; Kim & Kankanhalli, 2009; Lapointe & Rivard, 2005; Lin et al., 2010; Rhoda, 2010; Sanford & Oh, 2010) in comparison to technology acceptance. To their credit, researchers have examined behavioral aspect of users' resistance to change (Joshi, 1991; Kim & Kankanhalli, 2009; Lapointe & Rivard, 2005; Lin, et al., 2010), passive resistance behavior (Czaja & Sharit 1998; Trauth, 2006), constraints related to IT innovation (Rhoda, 2010), constraints for using social media (Witkemper, Lim, & Waldburger, 2012) and resistance to adopt mobile services (Chen et al., 2013; Rohm, et

al., 2012; Sanford & Oh, 2010; Watson et al., 2013). This section will discuss some of the reasons identified as constraints in adopting new technologies.

The Equity-Implementation (E-I) Model

Since the development of information systems, various studies have offered insights into why people use technologies, but paid less attention to identifying some of the reasons that are associated with why individuals resist or reject technologies (Laumer & Eckhardt, 2012). It is important to understand the underlying reasons for resistant behavior in order to overcome such limitations in the future to attract and engage a wider range of consumers.

In attempt to provide theoretical explanations of how and why user resistance occurs, Joshi (1991) examined the implementation of new technology from a business management aspect. The researcher indicated that individuals in an organization naturally attempt to evaluate changes that occur in their workplace. Based on the evaluation of outcomes, people adopt changes perceived as favorable but resist when they are perceived as unfavorable. With this in mind, this study proposed equity-implementation (E-I) model as one of the ways to assess the relationship between resistance and its antecedents. In terms of the theoretical frameworks, the E-I model was one of the first models introduced in information technology (IT) to address constraints related to innovation (Joshi, 1991). The model was developed based on equity theory, which is a widely used theory in social science to explain relational satisfaction in terms of perceptions of fairness distribution of resources within interpersonal relationships (Adams, 1963). In other words, individuals evaluate fairness based on perceptions of how much was gained and lost. Grounded in equity theory, the E-I model acknowledges the

fact that “in any exchange relationship, individuals are constantly concerned about their inputs, outcomes, and the fairness of the exchange” (Joshi, 1991, p. 231). A person who went through five hours of training to use a new computer would evaluate how much time he or she has saved, and will compare the benefits versus the effort made in the process. Individuals also constantly compare themselves with others and assess the importance of their inputs and outcomes in comparison to others. The comparison made between individuals will result in one’s perception of inequality. According to equity theory, the perception of inequality will finally result in resistance. For example, if someone believes implementing a new technology will increase their workload when compared to their co-workers, they are more likely going to resist change and implementation (Joshi, 1991).

The E-I model employed three levels of analysis from the equity theory to evaluate a user’s behavioral change process when implementing a new technology at work. At the first level of analysis, users assess change in terms of gain or loss based on their equity status. For instance, if changes result in greater benefit (outcome) when compared to the input, users would establish favorable views towards change. On the other hand, if the change results in more work hours (input) and less amount of work accomplished (output), users would establish negative views towards change and resent it. At the second level of analysis, the user is viewed as comparing his or her outcomes with that of the organization. The user compares the proportion of benefit obtained as an individual to the benefit obtained by the employer. If the employer’s benefit was perceived to be greater than the user’s gain, the change is viewed as unfavorable. For example, if an employee by learning a new skill had contributed to production increase

by 5%, which resulted in the overall profit increase by 30% for the employer, the change will be perceived to be unfavorable (Joshi, 1991).

At the third level of analysis, users compare their relative outcomes with other users in the referent group. For example, employees will evaluate whether the new system at work impacts everyone the same way or differently in terms of benefits. If the employee feels that the change had unequal benefits in comparison to his or her co-workers, he or she will perceive the change as unfavorable. For example, if an employee had reduced 10% of the workload but his or her co-worker had reduced 20% of the workload due to a new system, the implementation will be seen as unfavorable. All three levels of analysis focuses on equity perception of the users, and all levels are considered important. Following the theoretical explanation, Joshi (1991) provided case studies demonstrating how the three levels of analysis are used to evaluate the computer systems implementation in a practical business setting.

The E-I model introduced a useful tool for practitioners when predicting likeliness of resistance to change when implementing new technologies at work. The E-I model is still relevant today since functions of advanced devices (i.e., laptop computers, tablets, and smartphones) are capable of handling both personal and professional tasks. The portability and functional capacity of the devices allow people to go beyond the office doors and business hours to work at their desired location and desired time (Karlson et al., 2009). Therefore, with today's technology, the E-I model is extended to corporations and business entities that encourage portable device to improve work efficiency. For example, part of sport managers' job is to communicate with fans by quickly responding to their question using the Internet. However, if the sport managers

have negative perceptions towards using the Internet due to privacy issues, the task still be perceived as challenging to them, resulting in resistant behaviors. Furthermore, resistant behaviors observed above with previous technologies are still observed today with new technologies in terms of how users react to change. However, as a one-dimensional model, the E-I model was highly limited as it only focused on individual behaviors (Joshi, 1991).

Multilevel Model of Resistance

In order to overcome such limitations, Lapointe and Rivard (2005) expanded the E-I model by adopting a multilevel perspective approach towards understanding the nature of resistance. This multilevel model of resistance takes group behavior into account by acknowledging that, to a certain degree, group behavior emerges from an individual behavior. Using analytic induction, the researchers developed cases examining the implementation of clinical systems for hospital physicians, and the cases revealed that resistance occurred in multiple stages. First, when users in a group are introduced to a new system, they first make assessments at the individual and organizational levels. They then make projections about the consequences. If the consequences are perceived to be threatening, user resistance occurs (Lapointe & Rivard, 2005). For example, on a personal level, sport fans who were introduced to iPhone to receive sport news on their phone will think about technological challenges associated with using a new device. The fans may perceive potential errors occurring on an iPhone while reading sport news to be a frustrating experience. Therefore, the fans may prefer to read the sport news via a newspaper and thus reject changing their traditional way of accomplishing desired tasks. However, on an organizational level, during the implementation stage, the balance of

power between the groups will act to modify the initial condition and resistance. For example, if implementing a new system changes the dynamics of relationship between the physicians and nurses, resistance could occur even if the initial assessment and consequences were positive. The multilevel perspective captured users' resistance level at multiple stages in addition to considering both individuals' and organizations' resistance structure (Lapointe & Rivard, 2005).

To further examine this multilevel model, other researchers focused on resistance of technology within an organization (Lin et al., 2010). In addition, the researchers focused on organizational behavior to consider users' perception towards organizational norm and institutional arrangement. They surveyed 1,022 university employees regarding a computer-mediated communication information system (CIS). The participants consisted of 47% faculty, 27% administrative staff, 24% classified staff, and 2% administrators. The researchers also conducted open-ended interviews with 20 faculty and staff members. The results from this study revealed that users can support and resist new technologies simultaneously. For example, users who had been pre-exposed to the technology may understand the limitations that are associated with the new technology to accept the benefits, but resist the limitations at the same time. In this study, instructors using Blackboard program only accepted functions that they viewed as useful in their classes, while refusing to use unfamiliar or functions that appeared to be complex or unnecessary. Additionally, the researchers found that university members were more accepting of the CIS, believing that employing a new technology was the institutional norm of education. In other words, when a group of users within an organization perceives that implementing a new technology is the industry standard, users are more

accepting of the change (Lin et al., 2010).

Moreover, resistance for information system implementation was extended to include the additional perspective of status quo bias, which accounts for a user's preference to stay with the current situation (Kim & Kankanhalli, 2009). The researchers defined user resistance in information system (IS) in this study as "opposition of a user to change associated with a new IS implementation" (p. 568). The study target sampled a 5,800-employee organization that deployed a new enterprise system, which took a year to customize. The study randomly sampled 500 employees, and revealed that perceived value, switching costs, and organizational support for change had significant effects and accounted for 62% of the variance in user resistance. This result may have been influenced by the users' status quo bias as subjects may not have seen the added value for switching to a new system. The study also concluded that switching costs was the key determinant of user resistance, which also supports the E-I model (Joshi, 1991) in reference to gain or loss in equity status. For example, users who view switching costs to be high in comparison to the benefits that would be received from the new system are more likely to resist the change (Kim & Kankanhalli, 2009). The human nature to stay within their comfort level of technology is evident in this study.

According to social identification theory (Ashforth & Mael, 1989), user behaviors translate between professional, personal, and leisure because a person is capable of having multiple identities depending on the social environment. With today's devices that allow users to cross the boundaries between work and personal life, resistant behavior towards new systems at work transfers onto personal life (Karlson et al., 2009). For instance, users who demonstrate resistance towards learning Microsoft Excel at work

will not likely learn it for personal purposes. Considering the human interaction between a new technology and a person, the models introduced above are helpful in understanding user's resistances that are associated with implementing new technologies. On the contrary, when considering the wide spectrum of technologies that are capable of approaching task from a multi-device (e.g., email access from PC and iPad), the findings from previous studies may be limited as the models focused on resistant behaviors of employees at an organization. Therefore, examining users' resistant behavior from a various perspectives will provide helpful information in understanding how resistant behavior transitions from one's professional to personal life.

Individual Resistance

Today's technology is not only capable of approaching tasks from a multi-device standpoint, but is also able to cross both work and personal tasks. Therefore, it is important to examine resistance behavior from an individual level. Considering individual resistance, it is important to understand who the target groups are and how adoption of technology will fulfill their needs (Rhoda, 2010). Similar to the complex structure of how users accept technology, individuals who portray resistant behavior towards technology are not a homogenous group. According to Rhoda (2010), two dimensions of individual information technology resistance are active resistance and passive resistance. Active resistance occurs in two levels where the individual is either a rejecter or postponer. The rejecter will refuse to use the technology due to functional, psychological, or informational barriers even when information regarding the technology is available. The postponers will delay the adoption process as they wait for the right moment to adopt. For instance, rejecters will resist adoption of the iPhone as they believe

the smartphones are difficult to use, whereas postponers will delay the adoption until price is reduced. On the other hand, passive resistance occurs when individual has no knowledge of the technology (unaware) or when he or she has no interest in the product. For example, a traditionalist who is not interested in the newest technology will not be interested in purchasing the latest iPhone. Passive resistance is more subtle when compared to active resistance (Rhoda, 2010), and both dimensions of resistance are relevant to today's fast changing technologies. However, the literature has heavily focused on active resistance behavior as researchers are interested in determining ways to overcome limitations associated with technologies.

A relevant study found in relation to an individual's device was a study that examined resistance in the adoption of a mobile data service (Sanford & Oh, 2010). Using the frameworks of the information system resistance models and TAM by viewing the variables as an inhibiting force, Sanford and Oh (2010) concluded that a user's resistance to change was one of the major contributors in adopting mobile data. The researchers sampled building inspectors in Eastern Europe who accessed the building database using BlackBerry to update inspection information on the job site. Accounting for employees who did not use BlackBerry, two 8-hour days of training were given to 130 employees at the organization. The employees were surveyed immediately after the training and after three months of usage. The results of the study revealed that resistance to change had a significant negative effect on mobile data service usage behavior and a strong negative effect on perceived usefulness. For example, a minor error encountered while using a mobile phone may lead a user to believe the mobile phone's overall quality is poor, and therefore not useful. The negative perception will then result in resistance to

change. The study results were similar to the previous studies conducted in information system (Davis, 1989; Tseng, et al., 2012) in ways that users' intention to adopt technology were influenced only when they perceived the technology to be easy and useful.

Similarly, Rohm, Gao, Sultan, and Pagani (2012) evaluated mobile marketing efforts by examining youth consumers' mobile content adoption behaviors. Based on TRA and TAM, the researchers focused on drivers of consumer attitude towards mobile marketing and their actual usage behavior in regards to mobile marketing activities. A total of 450 youth consumers in the U.S. reported users' perceived usefulness and positive attitude toward mobile marketing are critical for the success of mobile marketing efforts. Additionally, consumers' levels of innovativeness and personal attachment were identified to enhance users' attitude towards mobile marketing. On the other hand, the researchers discovered that users' desire for privacy and risk avoidance were found to negatively affect perceived usefulness and positive attitude. For example, if the mobile content was perceived as dangerous due to the risk involved in the release of personal information, the user would be less likely to perceive the content as useful and would avoid the content. The study also found that users were hesitant to release credit card information or other personal biographic information as opposed to email addresses and phone numbers for registering their mobile apps. Furthermore, users' high level of personal attachment to their phones were found to negatively affect the attitude towards the mobile contents as they developed higher expectations for mobile services when compared to users who were not attached to their phones (Rohm et al., 2012).

In the same context, Chen, Liu, and Dai (2013) interviewed 20 smartphone users

in China to examine users' smartphone consumption behavior as it relates to mobile marketing communication. The study has revealed that the price of an app and satisfaction of users' needs to be additional factors that could negatively influence mobile marketing efforts. The majority of the participants were drawn to download only the free software and apps, indicating high price will discourage users from adopting the mobile contents. Additionally, the participants indicated that the advertisement and mobile commerce had to meet their needs. For instance, one of the participants mentioned receiving coupons was deemed beneficial even when the user was required to accept advertising on his or her smartphone. However, when the received advertisement was not seen as beneficial, the content was instantly deleted.

Drawing from this study, technology resistance will likely occur when users' needs are not met or when technology is perceived to be useless. Other possible negative attitudes towards mobile marketing efforts are also examined based on users' active resistance behavior as it includes negative experience due to malfunction of the technology and poor service. According to Watson et al. (2013), the most commonly accessed content was information on a website and newspaper or magazine adverts provided by the pull technology of QR (Quick Response) codes. The participants in this study indicated that they most strongly agreed with the statement "I feel irritated when a website does not work well on my mobile handset" (p. 845). The participants also reported that they felt negatively towards a brand that provided a poor mobile website.

While researchers explored users' resistance behavior, others have made an effort to examine both motivations and constraints related to the Internet (Hur, et al., 2007), fantasy sports (Suh, Lim, Kwak, & Pedersen, 2010), and social media (Witkemper,

Lim, & Waldburger, 2012). Hur and his colleagues proposed and tested a conceptual model for online motivations and concerns for sport fans when accessing the Internet sport information and shopping. The conceptual model is the foundation for their later model discussed in the next section (i.e., Sport Website Acceptance Model; Hur et al., 2011a). In the study, they proposed five types of motivations (i.e., convenience, information, diversion, socialization, and economic), and four types of concerns (i.e., security and privacy, delivery, product quality, and customer service). The researchers claimed the fit of the model was good based on confirmatory factor analysis (CFA) results that examined the relationship between 31 variables and nine latent constructs identified in previous literature (e.g., Anderson & Srinivassan, 2003; Kau, Tang, & Ghose, 2003) concerning online consumption behaviors. They also tested the effects of motivations and concern constructs on actual usage by using the structural equation modeling (SEM) technique. The results revealed the motivations construct to be a significant predictor of actual usage, while no significant path coefficient was found for concern constructs to actual usage. In addition, a path coefficient from concerns to motivations was not significant for their model. Despite the result, concern variables relating to product quality, security and privacy, customer service, and delivery should not be undermined as the summated mean scores for them were all higher than the median, ranging from 3.80 to 4.72 in a 7-point Likert scale survey. Among the constraints, the participants expressed concerns for security and privacy as they scored high on the “I am uncomfortable giving my credit card number on the Internet” item (Hur et al., 2007, p. 531).

In the same line of research, Suh, Lim, Kwak, and Pedersen (2010) identified

motivations and constraints associated with fantasy sports participants. According to the researchers, fantasy sports are unique as the consumption occurs in both a real world and virtual world. Based on previous studies, (e.g., Carroll & Alexandris, 1997; Seo & Green 2008; Sloan, 1989; Trail & James, 2001; Wann, 1995), the researchers examined 12 latent constructs related to motivations and constraints factors by conducting a CFA. The 12 constructs included seven motive dimensions (i.e., economic, social interaction, escape, fantasy, achievement, knowledge, and pass time) and five constraint dimensions (i.e., time, accessibility, lack of interest, lack of partners, and lack of knowledge). Following CFA, they conducted SEM to understand the influence of motivations and constraints on fantasy sports participants' attitude. The results from the CFA indicated that the overall fit of the model was good. Based on the results from SEM, the researchers reported the motivations construct to be a significant predictor of attitude towards fantasy sports participants. In addition, contrary to Hur et al.'s study (2007), the study reported a significant path coefficient from constraints, indicating a negative influence of constraints on attitudes toward fantasy sports participation. The results from this study are noteworthy as some of the identified dimensions of motivations and constraints may only be applicable to fantasy sports participants. For instance, not having a person to play fantasy sports with (lack of partner construct) or being too busy to play fantasy sports (time construct) are only applicable for the ones who cross both the real and virtual worlds.

Recently, researchers have also examined motivations and constraints related to social media usage (Witkemper et al., 2012). For constraints measures, the researchers employed variables from leisure constraint research originated by Crawford and Godbey

(1987). The included variables for constraint measures were economic, social, skill, accessibility, and interest constraints. For instance, questions related to skill constraints included questions such as “I do not know where or how I can participate in following athletes on Twitter” and “I cannot find any friends or colleagues that use Twitter” to measure social constraints. The data were collected from 1,124 undergraduate students and were analyzed using SEM. The researchers found that motivations to follow athletes on Twitter positively affected usage. On the contrary, constraints related to skill and social were negatively related to their Twitter consumption behavior of following athletes. For example, sport fans who are less skilled in gathering information on Twitter are less likely to consume sport using Twitter, whereas fans who have high motivations to follow athletes are more likely to consume sport using Twitter.

The above studies highlighted active resistance behavior as constraints that are relevant to functional, psychological, or information barriers (Rhoda, 2010). Conversely, others reasoned age and gender differences to be possible explanations for passive resistance behavior. Czaja and Sharit (1998) examined different age groups to understand attitudes towards computer experiences. A sample of 384 participants performed computer tasks for a 3-day period to reveal that attitudes towards computers were similar across different age groups. However, they found a correlation between the age of participants and the level of perceived comfort, efficacy and control level. For instance, the older the participants were, the lower the perceived comfort, efficacy, and control levels they exhibited. They also found attitudes towards computer tasks were moderated by different tasks (i.e., data entry, database inquiry, accounts balancing) and gender. As mentioned above, difficulties lie with passive resistance behavior as many researchers

continue to argue whether age and gender differences are valid reasons for passive resistance (Trauth, 2006; Venkatesh & Morris, 2000; Wajcman, 1991). In detail, the researchers argued that individual differences (e.g., socio-economic background) may be underlying reasons behind the difference between gender and age groups (Trauth, 2006). Passive resistance is more subtle as it is difficult to detect the reasons for individuals' disinterests in adopting the technology, and it is also difficult to gauge the individuals' level of knowledge in technology. Whether active or passive, individual resistance is much more complex as differences among individuals are difficult to identify.

Overall, the findings above indicate that users' resistance towards technology is not directly opposite of users' intention to adopt technology. The dynamics between one's favoring and opposing forces often create complexity for understanding individual resistance behavior (Sanford & Oh, 2010). Based on the findings from above, resistance constructs are unique and distinct from adoption and usage characteristics (Sanford & Oh, 2010). However, limitations exist with theoretical frameworks involving technology resistance studies as the implications are specifically directed towards employee behaviors within the organizations. Limitations also exist with individual resistance behavior since the possible underlying reasons identified above are only relevant to current users rather than individuals who fail to fully adopt the technology. Furthermore, the studies examining both motivations and constraints identified constraints dimensions that are only relevant to technology specific consumption behaviors. For non-adopters and individuals who portray passive resistant behavior, studies are limited because the underlying reasons are far more complex. Considering the complex nature of technology constraints, researchers must understand the difference between constraints and adoption

behavior in order to comprehensively understand users' overall consumption behavior.

Technology Consumption in Sport

One of the ways to overcome some of the limitations that exist within the complex nature of technology constraints is to examine groups of individuals, such as sport fans, who may share similar interests or behave in a similar manner. With today's high capacity devices capable of completing work and personal tasks (e.g., smartphones), sport fans are subject to consume sport using the most convenient medium for them (Hur et al., 2011b). For example, sport fans who feel most comfortable searching for online information will most likely consume sport using the Internet. The advances in technology have allowed sport fans to conveniently access sport information and reach other sport consumers with ease in support of their fandom (Seo & Green, 2008). Considering the fact these sport fans are part of the larger group of technology consumers, the next section will highlight sport fan behaviors in order to cross the gaps between technology and sport consumption.

In sport, technology consumption behaviors are frequently observed from a spectator and fan perspective as these users follow sport via the most up-to-date technologies (Hur et al., 2011b; Seo & Green, 2008). Sport fans no longer need to wait for the newspaper to arrive at their front door to check the latest sport news. Instead, with our current technology, fans are able to obtain sport news and information instantly using their computers, smartphones, and tablets. Similar to other industries, the current trend of instant access to sport information has reshaped the way fans perceive sport news and information. In order to examine the changes due to these advances in technology, researchers have examined sport fans' technology consumption behavior by exploring

sport websites (Hur et al., 2011a; 2012, Hur et al., 2011b; Seo & Green 2008). This section will examine the Sport Website Acceptance Model (SWAM; Hur, et al., 2011a) and Motivations Scale for Sport Online Consumption (MSSOC; Seo and Green, 2008) that were developed to better understand the decision making process of online sport consumers.

Sport Website Acceptance Model (SWAM)

One of the most recent attempts to understand technology usage in sport through the TAM was the examination of sport websites. The Sport Website Acceptance Model (SWAM; Hur et al., 2011a) integrates the theoretical framework of the TRA and TAM to understand online consumption behavior. The conceptual model focused on the idea that “sports websites influence intention to use the websites, which in turn influences use of websites” (Hur et al., 2011a, p. 211). The SWAM consists of four salient factors: (a) perceived ease of use, (b) perceived usefulness, (c) perceived enjoyment, and (d) perceived trustworthiness, all deriving from the TAM (Hur et al., 2011a). The TRA framework also was incorporated to draw a relationship between “beliefs, attitude, intentions, and behaviors” and a user’s intention (Hur et al., 2011a, p. 212). The SWAM also suggested that one’s level of sport involvement and psychological commitment to sport led to intention to use the website. SWAM provided a comprehensive framework for understanding a sport fan’s perception of sports websites.

The perceived ease of use construct in SWAM was originally adopted from the TAM, and is defined as “the degree to which a sports fan believes that using a sports website would be free of effort” (Hur et al., 2011a, p. 215). Others have also referred to this construct as “the level of cognitive and deliberative effort that is required of the

individual in learning to use the technology” (Kwak & McDaniel, 2011, p. 242). The second salient factor, perceived usefulness, is defined as “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis, 1989, p. 320). Applying the above definition to sport consumption settings, sport fans would perceive a sport website to be useful or beneficial when they can obtain various types of information about their favorite teams, players, or sports leagues quickly and at once.

In SWAM, Hur et al. (2011a) adopted the perceived enjoyment construct from Davis, Bagozzi, and Warshaw’s (1992) study that examined extrinsic and intrinsic motivations of computer users in the workplace. Perceived enjoyment is defined as the extent to which sport fans expect sport websites to be fun and enjoyable (as cited in Hur et al., 2011a). Since the introduction of this construct (Davis et al., 1992), studies have documented perceived enjoyment as a significant determinant in the adoption and utilization of new technologies (Ha, Yoon, & Choi, 2007; Hsu & Lin, 2008; Moon & Kim, 2001). The last salient factor, perceived trustworthiness, refers to the perception of confidence in reliability, honesty, and trust in sport websites. This construct emerged as an important factor as the Internet became more sophisticated and served functions such as facilitating e-commerce and e-marketing while operating as a two-way communication channel (Belanger, Hiller, & Smith, 2002). In a sport context, trustworthiness could be broadened to include accuracy of the information posted on the sport pages, reliability of the sport news, and quality of discussion for fan portals.

Additionally, SWAM captures users’ sports involvement, which is defined as “the perceived interest in and personal importance of sports to an individual” (Shank &

Beasley, 1998, p. 436) by utilizing sports itself as the stimulus object. For example, a person who trains for a marathon will perceive the marathon to be an important part of his or her life, whereas non-marathoners would not share the same thoughts. In the realms of leisure and sports activities, involvement has shown to be a significant predictor of various sport consumption behaviors and pertinent psychological factors such as commitment and loyalty (Bee & Havitz, 2010; Bennett, Ferreira, Lee, & Polite, 2009; Hur et al., 2012; Iwasaki & Havitz, 2004; McGehee, Yoon, & Cardenas, 2003).

In order to validate the SWAM's core constructs, Hur et al. (2012) empirically tested the model using SEM. The researchers used two different models to test the relationship between the proposed constructs. For the first model, the results revealed that the relationship between sport involvement and actual usage was statistically not supported (Hur et al., 2012). The relationship between commitment, intention, and use was also statistically not supported (Hur et al., 2012). After determining that relationships among salient factors were not significantly supported, the researchers tested the second model explaining the indirect effect of non-significant relationship. The findings from the second model suggested that commitment indirectly influences intention and the actual usage, and identified consumer beliefs to be the important predictor. Sport involvement also was found to indirectly influence intention. The key variables of perceived ease of use, usefulness, enjoyment, and trustworthiness were also found to indirectly influence intention. Although the originally proposed SWAM was not fully supported, the indirect influence of the core variables were found to be important when predicting and measuring user intention towards sport websites.

Motivations Scale for Sport Online Consumption (MSSOC)

While SWAM examines the decision-making process of sport website users, the concepts captured in Motivations Scale for Sport Online Consumption (MSSOC) attempt to explain psychological and behavioral reasons beyond the actual consumption. The online consumption motivations in sport are primarily grounded in the MSSOC developed by Seo and Green (2008). The MSSOC identified ten dimensions of motivations, including fanship, interpersonal communication, technical knowledge, fan expression, entertainment, economic, pass time, information, escape, and support. The motivations included in the ten dimensions were examined separately in other sport motivations studies (Chen & Wells, 1999; Funk, Mahoney, & Ridinger, 2002; James & Ridinger, 2002; Trail, Fink & Anderson, 2003), but they were not all-inclusive for online motivations. The MSSOC was one of the first attempts to comprehensively understand motivations that relate to online sport consumption.

The first dimension, fanship, is defined as “the reason that one considers oneself a huge fan of particular sports and teams” (Seo & Green 2008, p. 86). Fans often visit their favorite team’s website to obtain new information or to seek additional insights about the team they support. The information gathered from the website is often shared with others, forming a communication channel. The motivations to communicate with other fans are labeled as the interpersonal communication, which refers to the motive to share sport knowledge with other fans. Another type of knowledge sports fans obtain from the website is the technical knowledge, which refers to motivations to learn specific rules or skills on the websites. The fourth dimension, fan expression, is defined as the concept of fan community, belongingness, and subcultural expressions. For example, fans often find ways to express their feelings or opinion about the teams they follow through

communication channels such as social media (e.g., Twitter, Facebook), blogs, or chat rooms. Sport team websites also provide fans with forms of entertainment such as games, videos, and pictures to excite the fans who visit their official website. The excitement created on the website is determined as entertainment, which is the fifth dimension, and is defined as motive to enjoy sports using a website. Certain sport websites offer incentives such as free game tickets and discounted merchandise to continue attracting fans to their websites. The motivations to obtain incentives or buy gifts are defined as the sixth dimension, economic. The seventh dimension, pass time, is defined as the motive to pass time through use of sports team's websites. Included in this scale are information, which is defined as the motive to learn about things happening in the sport world, and escape, which is defined as motive to relax through navigation of team's website. Finally, the tenth dimension, team support is defined as the motive to show support for favorite team through team's website. The MSSOC provides a wide range of motivations fundamental to understanding consumption behaviors regarding a new technology medium.

In order to validate the scale, Seo and Green (2008) initially conducted exploratory factor analysis (EFA) to generate a 10-factor, 40-item scale. Following the CFA, the scale was reduced to include 30 items and 10 dimensions measuring sport online consumption motivations. The results revealed the 10 dimensions had acceptable levels of Cronbach's alphas ranging from .77 to .90 and reported a positive correlation with users' web commitment, which established further validity. To date, various studies have either fully or partially adopted MSSOC in studies examining other types of websites (Hardin et al., 2012; Hur et al., 2011a) and mediums (Dwyer & Kim, 2011; Hambrick & Mahoney, 2011) related to sport consumption. The studies that employed

the MSSOC exemplify its adoptability for other mediums as well as studies relevant for sport consumption.

Hardin et al. (2012) examined the relationship of motivations, perceived value, and usage for website subscriptions by employing the MSSOC. The data were collected from the Rivals.com network that had 7,100 subscribers. The results from 499 sport fans revealed team support, information, interactivity, diversion, and perceived value to be important motivating factors for sport website subscribers. Similar to Seo and Green's (2008) finding, the average subscribers of the Rivals.com site primarily connected to the site as part of their escape activity and gathered information to increase their knowledge about their favorite team. The study confirmed motivating factors for web subscribers were similar to those of other sport fans who connected to sport websites. In detail, they discovered that loyal subscribers frequently visited the site and used it as an entry point into other sport websites.

For other mediums, Dwyer and Kim (2011) developed a motivational scale for fantasy football participants, employing the fanship and escape dimensions from the MSSOC. Since many of the fantasy football participants form an online community, the researchers determined that communicating with sport fans with similar interests was an important motive for fantasy football fans. They also reported that fantasy football fans' participation motivations came from perceiving fantasy football as entertainment or a means to escape. By examining these fantasy football participants, they found that MSSOC variables such as fanship and escape dimensions were important to consider when understanding sport fan motivations.

In addition, Hambrick and Mahoney (2011) examined Twitter by using

categories derived and modified from the MSSOC. The researchers specifically employed the operational definition of content, fanship, and promotional, and applied it to Twitter-specific motivations. For example, the definition of content was adopted to represent tweets containing links to other sites or pictures. By adopting these categories from the MSSOC, their study revealed that celebrity athletes often used Twitter messages for communication and promotional purposes. Similarly, Witkemper, Lim, and Waldburger (2012) employed 12 items from MSSOC to examine motivations and constraints of Twitter use in sport. For the results related to motivations, the researchers indicated information, entertainment, pass time, fanship, economic, skill, accessibility, and social constructs to be significant predictors of actual usage of Twitter. Specifically, fanship, information, and entertainment motivations were reported to be strong predictor variables (Witkemper et al., 2012).

Furthermore, Hur et al. (2011b) used the MSSOC comprehensively to understand the relationship between a sport website's quality, e-Satisfaction, and e-Loyalty. In their study, the researchers determined that loyalty to a sport team's website was more likely to occur when fans developed positive perceptions towards the website (Hur et al., 2011b). Considering the studies above, MSSOC's operational definitions and primary motivations are useful when identifying users' motive to consume sport online. However, the MSSOC may be applicable to other technologies, as it touches upon possible motivations that users may experience when consuming sport through a new medium. Therefore, when exploring consumer motivations toward technology or new media, the operational definition and survey instrument provided in this study could be employed to enhance understanding of the consumer behavior.

It is important to note that the ten dimensions of MSSOC are not separate from the previous studies examining user perceptions (SWAM; Hur et al., 2011a; TAM; Davis, 1989; TRA; Fishbein & Ajzen, 1975; UTAUT; Venkatesh et al., 2003;). User perception captures intention to use technology prior to usage, while motivations are captured upon actually using the technology. In other words, users' intention and decision making processes and motivations are highly relevant as intentions naturally lead to motivations upon actual usage. For example, perceived usefulness and perceived ease of use from TAM are fundamental in understanding how sport fans approached the team's website initially. The perception then naturally leads to information motivations as fans desire to obtain sport information conveniently. In a similar manner, perceived enjoyment from SWAM serves as a base for entertainment motivations. For instance, sport fans will develop a perception to expect the sport website to be enjoyable, which eventually transforms into entertainment motivations once the fan starts to have fun on the website. In addition, the subjective norm construct from TRA and social influence from UTAUT initiate interpersonal communication motivations since many sport fans believe conversing with other fans who share similar interests to be acceptable fan behavior. Understanding the relationship that exists between user intention and motivations will provide a comprehensive view towards understanding sport fans' technology consumption motivations.

Sport Consumption

As mentioned in the MSSOC, sport fanship demonstrates the behavior of people who refer to themselves as a "fan" and captures their response to sport. Sport fans that are primary consumers of sport are quite different when compared to traditional product

consumers (Smith, 1988; Sutton et al., 1997). Although sport consumption behavior is similar to product consumption behavior in terms of purchase, sport consumers are different in the ways that they become emotionally and psychologically attached to their favorite players and teams (Smith, 1988). According to Sutton, McDonald, Milne, and Cimperman (1997), “sport differs from other sources of entertainment through evoking high levels of emotional attachment and identification” (p. 15). In addition, unlike other industries where millions of dollars are spent to attract customers, sport fans often choose to become fans for multiple reasons (e.g., family and group influence). Depending on the reasons, sport fans exhibit different types of consumption behavior. Considering the unique characteristics of sport fans, this section will explore ways to examine sport consumption behaviors based on social identity theory and fan identification.

Social Identity Theory

One of the ways to examine sport fans’ consumption behavior is through the framework of social identity theory. Social identity theory was originally developed to explain group behavior as a part of a social-psychological construct (Crane & Ruebottom, 2011). Over time, social identity was found to influence self-concept of affiliation, attachment, identification, and action to reflect “multiple selves” (Laverie & Arnett, 2000, p. 227). In fact, the concept of self considers multiple identities and draws connections between self and its role in society (Laverie & Arnett, 2000). For example, a person who is a baseball fan could also be a father who supports the Republican Party. He would view himself from multiple angles depending on his selection of the groups (i.e., baseball fan or father or Republican). Conceptually, the individual’s identity revolves around a cluster of social units, and the interaction created within each unit impacts the

individual's life. Considering the different roles the individual plays, social identity theory provides a possible explanation for how and why the individuals decide to take on a certain role over others (Serpe, 1987).

Another way of looking at social identity theory is to perceive it as a way to categorize and classify individuals into social categories (Ashforth & Mael, 1989). Social classification allows people to identify themselves in a social environment to answer the question of who they are in comparison to others (Tajfel & Turner, 1985). Related to how individuals play multiple roles, classification also works the same way in terms of how individuals categorize themselves. For example, a person may define and categorize herself as an American, Catholic, and a teacher. Essentially, the major role of group identification drives the social identification, and they are often used interchangeably (Ashforth & Mael, 1989).

Although social identity theory was originally created as a part of a social-psychological construct, the theory evolved in different fields examining connections between self and social environment (Lam, Ahearned, Hu, & Schillewaert, 2010). In relation to sport, fans are a unique group that consumes sport and affiliates with sport followers. Social identity is also particularly applicable for sport, since fan behavior involves connecting with others, developing a fan role, and providing satisfaction associated with the role (Donavan, Carlson, & Zimmerman, 2005; Laverie & Arnett, 2000). According to social identity theory, individuals have both personal and social identities (Tajfel & Turner, 1985). Personal identity is comprised of specific attributes related to an individual's characteristics and interests. In addition, social identity is comprised of attributes that are related to how individuals perceive themselves in terms

of group membership. The individual's perception of identity, whether personal or social, is examined in the studies that explored one's consumption behavior (Laverie & Arnett, 2000; Lock, Taylor, Funk, & Darcy, 2012; Reysen, Snider, & Branscombe, 2012; Underwood, Bond, & Bear, 2001). Social identity theory is fundamental in understanding sport fans as their fandom primarily influences their overall behavior.

Social Identity Theory and Sport Consumption Behavior

When individuals identify themselves as fans, they not only strongly identify themselves as such, but also display unique behaviors when it comes to sport consumption. For instance, using social identity theory as a framework, Laverie and Arnett (2000) developed and empirically tested a model of factors that influence fans' game attendance. Based on previous literature, the researchers first presented a hypothesized model suggesting the existence of directional effects from fans' situational involvement, attachment, and enduring involvement to identity salience. The operational definition for situational involvement is an individual's ongoing concern for activity due to temporary conditions (i.e., time conflict, commitment). Enduring involvement is an ongoing concern with an activity (i.e., performance of a team). Attachment in this study refers to the degree of connection with a sports team. The focus of this study revolved around identity salience of a fan. According to Stryker (1968) social identity theory takes into consideration that the identity of an individual is situational, and depending on a situation, individual's identities are formed hierarchically (as cited in Laverie & Arnett, 2000). For example, a person at work would prioritize his or her identity as an employee, but will prioritize his or her role as a friend when going out to dinner with group of friends after work. Laverie and Arnett (2000) proposed that identity salience and

satisfaction are both directly related to attendance, whereby individuals who have stronger connections to and satisfaction with a sport are more likely to attend.

Their hypothesized model was empirically tested by sampling 190 college students at the end of the National Collegiate Athletic Association (NCAA) women's basketball season. Based on the results, the proposed model accounted for 65% of the variance in identity salience, 26% of the variance in satisfaction, and 22% of the variance in attendance, respectively, indicating the identity salience to be the most important factor that influences attendance. In other words, respondents of this study perceived their identity as a sport fan to be more important than other identities. The more they prioritized the role of being a fan, the more frequently they attended the game. Furthermore, the study revealed that situational involvement, attachment, and enduring involvement factors were positively related to identity salience. In other words, the more concerns participants had about the team and the more they felt attached to the team, the more they prioritized their identity as a fan. Identity salience and satisfaction together also had a positive influence on attendance. Based on the results, the positive relationship between the factors showed that the participant's identity as a sport fan could be encouraged by providing an environment with which fans could become more involved and attached (Laverie & Arnett, 2000).

Using social identity theory as a framework to understand identity formation, Lock, et al. (2012) explored how team identification develops for sport fans. The researchers conducted in-depth interviews with 21 participants who were members of the Sydney Football Club (FC). The identified themes were centrality, personas, searching, and spruiking, and explained how individuals identify themselves with the team.

Centrality refers to how the fan's life revolves around the team and how the team becomes part of a fan's life. For example, a participant of this study talked about how he organized his daily schedule around the games, indicating the central position of the Sydney FC in his self-concept. Persona in this study is concerned with the process of getting to know the team and players and how the development process affects the fan's identity. Searching, on the other hand, refers to the socialization process of learning to become part of the team by following the news and media. For example, being up to date on club news allowed fans to share and display their knowledge about Sydney FC with others. The final theme identified in this study was spruiking, which refers to the individual's desire to spruik (i.e., elaborate) and promote the team to others. The participants talked about how they would bring friends to the game who do not normally support the club to change their perspective. Such behavior may positively alter one's view to become part of the Sydney FC members.

The study was one of the first to examine the process of how fans identified with the team by capturing the fan's personal experience (Lock et al., 2012). Using social identity theory, team identification forms depending on how individuals identify themselves as a part of the team. Other relevant studies further suggested that team identification and teams' performance was a statistically significant predictor for sport consumption in terms of attendance and purchase of merchandise (Fisher & Wakefield, 1998; Gray & Wert-Gray, 2012; Trail et al., 2003).

As mentioned in the previous studies, the conceptual framework of social identity theory captures how individuals perceive and identify themselves in a social environment. Social identity theory is capable of explaining consumer behaviors in any

field that examines how one's identity is influenced. However, social identity theory is often employed in the field of sport (Underwood et al., 2001) as sport fans instantly connect with others who share the same interest in forming a sense of community and exhibiting group behavior. Many sport fans associate themselves with their favorite team or players, making fandom part of their identity by claiming that they are a "Los Angeles Lakers fan," "basketball fan," or simply a "sports fan." Sport fans commonly identify themselves as a fan as part of group identification. Thus, social identity theory is extended to fan identification and team identification. In fact, the concepts of fan identification and team identification stem from social identity theory (Fink, Parker, Brett, & Higgins, 2009).

Fan Identification

Fan identification is defined as "the personal commitment and emotional involvement customers have with a sport organization" (Sutton et al., 1997, p.15). Others have defined it as the degree to which one feels a psychological connection to a team or sport (Murrell & Dietz, 1992; Wann, 2006). The general concept of fan identification developed to capture information regarding the fans' motivations and benefits that are associated with the level of motivations classification. The importance of this classification relies on the fact that each fan differs in degrees of involvement and association with his or her favorite team (Dietz-Uhler & Lanter, 2008). Researchers have also determined that identification has a close relationship with "team-related affective, cognitive and behavioral outcomes" (Stevens & Rosenberger, 2012, p. 223). In other words, the more the fan identifies with a team or sport, the more likely he or she becomes engaged in activities such as media consumption to support the team (Fisher & Wakefield,

1998; Wann & Branscombe, 1993). For instance, highly identified fans will spend more time online searching for teams' most updated news in comparison to others who are not connected to the team. Therefore, increasing fan identification contains benefits of increasing desirability, satisfaction, and loyalty towards a team (Sutton et al., 1997). The benefits associated with understanding the different levels of fan identification are enormous, since not all the fans behave in the same manner.

The level of fan classification is commonly referred to as low, medium, and high depending on the degrees of attachment and fandom towards a team or sport (Sutton et al., 1997). In an attempt to comprehensively understand levels of fandom portrayed by fans, Sutton et al. (1997) explicitly discussed the conceptual framework for fan identification. With low identification, the individual's relationship with the team is seen as a long-term relationship with the team, and such identification comes with low levels of emotion, financial commitment, and involvement. Low identification fans are also referred to as social fans since they are attracted to the pleasure and entertainment aspects of sport. For example, someone who enjoys the ballpark atmosphere because they enjoy hanging out with friends would fall into the low identified fan category. For many people initial attraction to sport is entertainment, and with this in mind, the positive experience at a sporting event could influence growth within the team identification.

For medium identification, fans are associated with a sport team based upon team performance, player personality, or social factors. Some of these fans are referred to as focused fans, and among them exist fans who are achievement-seeking. Although positive association is observed between the team and the fans, their achievement-seeking behavior is often viewed as a short-term relationship. For example, medium identification

fans will wear teams' jerseys, but their level of identification could be highly influenced by the teams' performance in terms of wins and losses. Finally, high identified fans are also referred to as vested fans demonstrating the strongest loyal fanship towards their favorite team. High identified fans exhibit long-term relationships and often show high commitment in terms of time or money, or both. High identified fans may also view themselves as an extension of a team and often refer to the team as "we" and "us." For instance, a high identified Dodgers fan will purchase the season ticket, other team related items (e.g., jerseys, hats with logo), and be proud of the team's history regardless of the performance outcome.

Depending on the level of fan identification, fans will behave and act differently. Fans' behavioral responses and consequences affected fan loyalty, pro-social behavior, and psychological well-being (Dietz-Uhler & Lanter, 2008). For example, high identified fans were more engaged and involved with a team when compared to low identified fans (Gray & Wert-Gray, 2012; Wann & Branscombe, 1993). In terms of cognitive responses, team knowledge, perceptions of teams, and attributions were found to affect fan identification. For example, fans with high identification indicated deeper knowledge about the team when compared to low identified fans (Wann & Branscombe, 1993; Wann, Schrader, & Wilson, 1999). In support of previous studies, Wann, Morris-Shirkey, Peters and Suggs (2002) examined bias assessments of team performances by examining high identified sport fans. The researchers surveyed college students to explore how fans identified the verb describing their favorite team. Based on the choice of verb used by the fans, the findings revealed that high identified fans are subject to biased assessment of their favorite team compared to low identified fans. For instance, high identified fans

would intentionally choose the verb that was less intense (i.e., “defeated” versus “shellacked”) to protect their identity as they highly associate themselves with the team (Wann et al., 2002). As mentioned above, high identified fans are loyal and protect their territory and identification as they consider themselves as an extension of the team.

Most sport fans can easily talk about their favorite team or sports, and often demonstrate their passion by expressing their emotions associated with them. However, the strength of connection among sports, teams, and fans differs for each fan. Fan identification is one of the ways to measure the degree of strength portrayed by the fans. In fact, fan identification was first developed to quantify and understand the level of one’s fandom (Brown, Devlin, & Billings, 2013). Moreover, fan identification considers fans’ level of commitment and involvement in “psychological and behavioral aspects of identification” (Underwood et al., 2001, p. 3). For example, an avid fan may not be ashamed to show his or her emotion by yelling and screaming during a game, when casual fans may not be influenced emotionally by that game.

The level of fans’ commitment and involvement is also highly noticeable through how fans respond. Fans’ responses include attending sporting events, viewing sports on televisions and listening to them on the radio, as well as engaging in sport discussions (Melnick & Wann, 2004). Obviously, the more fans are attached to a team or sport, the more they engage in activities to express their fandom. A study that examined how sport fandom influenced fan behavior reported that high identified fans were more likely watch sport on television when compared to low identified fans (Melnick & Wann, 2004). For example, avid tennis fans will annually watch and follow the U.S. Open more so than average tennis fans. On the contrary, from a consumption perspective, the nature of sport

elicits an uncontrollable outcome that can influence an invested consumer's experience and emotional state (Kaynak, Salman, & Tatoglu, 2008). In other words, a fan's behavior can possibly fluctuate depending on the performance of his or her favorite team, which in turn can result in changes in a fan's consumption behavior. Such behavior is often observed with fans who are "high-achievement-seeking," the ones who view the outcome of the game to be the most important factor to attend the game (Sutton et al., 1997, p. 17). For such fans, their favorite team winning the Super Bowl can suddenly make the fans purchase excessive amounts of team-related merchandise to capture the memory of such a moment even when the fans had only purchased a couple of team-related products before. Alternately, some fans may periodically purchase products in support of their favorite team regardless of the outcome of the team. Thus, all sport fans may engage and respond differently to the same game or sport depending on the degree of their fandom.

Previously, researchers identified geographic location, gender, and social identity as possible reasons for such a unique type of sport consumption behavior (Reysen et al., 2012). Another possible explanation for this difference is accounted for by the individual differences and characteristics among the fans (Donavan et al., 2005). For instance, depending on the degree of fanship, one fan may attend every game in a season when others may only watch the major games. The degree of individual differences in level of fanship is associated with one's fan identification. Therefore, fan identification is often used in sport marketing in order to segment fans into different categories (Sutton et al., 1997). In sport, market is segmented based on demographics, psychographics, product usage, and many other ways in order to maximize market responses and customer satisfaction (Mullin, Hardy, & Sutton, 2007). Fan identification works the same way in

order to better understand how a fan relates to the sport market. Each individual sport fan is considered to be different and unique as the levels of identification influence fans differently in terms of behavioral, cognitive, and affective responses (Wann & Branscombe, 1993). More specifically, Wann and Branscombe (1993) examined college students' overall identification with the college's men's basketball team to determine that students who high identified with the team were more involved, viewed other spectators at the game as special, and were willing to pay more to watch important games, unlike those students who were low in identifying themselves with the team.

Measuring Fan Identification

Considering the conceptual frameworks of fans' social identities and fan identities, various studies have proposed ways to quantify one's level of fan identification. More specifically, the measurement tools and models demonstrate some of the approaches used to classify sport consumers, in order to better understand and predict one's sport consumption behaviors (Stewart, Smith, & Nicholson, 2003). The majority of the assessment tools are strongly grounded in the theoretical and operational definitions examined in the previous section (Wann & Branscombe, 1993).

The evidence from the studies above suggests groups of fans with varying levels of identification contribute to different types of behaviors. The differences are measured both directly and indirectly (Dietz-Uhler & Lanter, 2008). Direct measures focus on sports fan identification (Wann & Branscombe, 1993) and indirect measures focuses on connection to a team (Trail & James, 2001) and psychological commitment to a team (Mahony et al., 2000). Other indirect measures also include measuring the frequency of attendance, number of viewers on television, or amount of money spent on fan

merchandise (Murrell & Dietz, 1992). Both direct and indirect measures are highly correlated in predicting sport fan behaviors (Wann & Pierce, 2003).

One of the most prominent ways to measure the level of fan identification is by using a direct measure (Dietz-Uhler & Lanter, 2008). Others have referred to this model as a tiered typology, as sport consumers are ranked depending on fans' beliefs and behavior (Stewart et al., 2003). Wann and Branscombe (1993) developed a Sport Spectator Identification Scale (SSIS) to assess fan identification based on the attributes of fan involvement, attributions and outlook, investment, and friendship among fans. The scale measured sport fans' individual differences based on the level of identification with a team. In this study, fan involvement refers to the extent and length of a fan's involvement with his or her favorite team. For example, high identified fans are more likely to be involved with every event associated with their favorite team when compared to fans who occasionally watch the game. Attribution and outlook are, respectively, the team's current standing and its future outlook for the remaining sport season. For instance, high identified fans will demonstrate positive attributions for the team's performance when compared to low identified fans who may not have any hopes of the team's current or future performance. Investment refers to the amount of money and time a fan is willing to invest or has invested. In other words, the time a fan will be willing to stand in line to purchase a ticket in a prime location represents an investment. Lastly, friendship among fans refers to the extent to which fans see other fans of the team as special. For example, high identified fans believed that other fans in their team were special and that they bonded well together by sharing a common interest (Wann & Branscombe, 1993).

With the above operational definitions, the researchers designed questionnaires

and conducted reliability analysis and factor analysis to validate the scale. Upon validating the scale, the researchers sampled 358 students to examine the degree of fan identification with each participant's favorite team. The fans were separated into high, moderate, and low identification levels based on the mean score of the attributes of fan involvement, attributions and outlook, investment, and friendship among fans constructs. The finding revealed a significant difference among fans with high, moderate, and low identification. In other words, each fan belonging to a different identification group demonstrated a different overall behavior. Additionally, the study results indicated statistically significant differences in behavioral, cognitive, and emotional reactions in determining fans' loyalty to a team. As expected, high identified fans demonstrated more involvement, investment, and positive attributions for the team (Wann & Branscombe, 1993). This proposed scale was further developed by Wann (1995) as a Sport Fan Motivations Scale (SFMS). Using the operational definitions above, the researcher identified eight underlying factors such as eustress, self-esteem benefits, escape, entertainment, economic factors, aesthetic qualities, group affiliation, and family needs constructs. The survey included 23 items, and the instrument was reported to be reliable and valid by Wann and colleagues (Wann, Brewer, & Royalty, 1999; Wann et al., 1999).

In addition to measuring fan identification directly, the construct can be measured indirectly by measuring motivations behind sport fans' connections to a team. In order to measure sport fans' consumption behaviors, Trail and James (2001) developed the Motivations Scale for Sport Consumption (MSSC) based on previous studies (Sloan, 1989; Milne & McDonald, 1999; Wann, 1995). The purpose of the MSSC was to improve previous scales by incorporating and combining the best aspects of previous

scales. The MSSC design was multidimensional because the constructs in the model took various attributes into consideration (Stewart et al., 2003). The MSSC contained 27 items representing nine factors, including achievement, knowledge, aesthetics, drama, escape, family, physical attraction, physical skills, and social interaction constructs. Additionally, the MSSC included two new factors (knowledge, physical attraction) in comparison to Sloan's scale (1989), and one more new factor (knowledge) in comparison to Wann's scale (1995). One of the new factors, knowledge, measures how knowledgeable a fan is by examining whether the fan keeps track of win-loss records or the statistics of a player. The other construct, physical attraction, measures the reason for watching the sport by identifying how likely fans find the players to be attractive. The rest of the constructs represent items included in SSIS under the same general theme. In order to validate the scale, the MSSC was administered to 275 seasonal ticket holders for a Major League Baseball (MLB) team. Based on the results of this study, the researchers determined that the scale was valid and reliable by indicating good construct validity, convergent validity, and discriminant validity.

Furthermore, fan identification has been examined and measured based on the antecedents and sponsorship outcomes (Gwinner & Swanson, 2003). Unlike other instruments that directly or indirectly measured fan identification, the researchers proposed a model capable of examining the impact of fan identification with the outcomes from a NCAA Division I football team. The four outcomes included in the model were sponsor recognition, attitude towards sponsor, sponsor patronage, and satisfaction with sponsor. In addition, the researchers included antecedents in the model based on previous studies that examined team identification (Fisher & Wakefield, 1998;

Wann & Branscombe, 1993). The three antecedents were prestige, domain involvement, and number of associations for predicting team identification among the spectators. In order to validate the model, the researchers sampled 992 spectators attending the NCAA Division I football game. Spectators at the game rated their attitude towards sponsors and fan identification based on a seven-point Likert scale. The major findings from the study indicated high identified fans associated positive outcomes related to sponsors by showing a positive correlation between attitude towards sponsors and fan identification. The high identified fans viewed sponsors more positively in comparison to low identified fans at the college football game. Furthermore, the study revealed that the level of team identification can be predicted based on spectators' perceived prestige of the university. In this study, the participants indicated the more they perceived their school to be prestigious, the more they identified with the team. Students who believed their school to have a good reputation would extend that belief to the football team. Moreover, using CFA and SEM analysis, the proposed model was validated (Gwinner & Swanson, 2003).

Although such scales claimed the accuracy of the measure, limitations exist for every model due to the complex nature of sport consumption. According to Holt (1995), "it is impossible to describe the archetypical sport consumer, because there are a multitude of interdependent values, attributes, and behaviors to consider" (as cited in Stewart et al., 2003). In other words, there is more than one way to explain what sport consumption entails. Therefore, some of the recent studies focusing on fan identity do not solely depend on one scale, but rather combine various scales depending on the purpose of the study. For instance, Stevens and Rosenberger (2012) employed scales from three different studies (Gladden & Funk, 2001; Mael & Ashforth, 1992; Shank & Beasley,

1998) to explore the relationship between fan identification, sports involvement, and fan loyalty. Gray and Wert-Gray (2012) used an instrument that combined scales from two different studies (Matsuoka, Chelladurai & Munehiko, 2003; Trail & James, 2001) to examine sport fans' retention based on team identification and team performance. Levin, Beasley, and Gilson (2008) also combined scales from two different studies (SIS; Madrigal, 2000; Wann & Branscombe, 1993) to measure NASCAR (National Association for Stock Car Auto Racing) fans' perceived group norms and fan identification. Furthermore, Hu and Tang (2010) combined SFMS and open-ended questions to measure sport fans' broadcast viewership by using fan identification as a mediator. These recent studies demonstrate the various ways to measure fan identification, and these scales could be used either independently or by combining certain portions of the scales depending on the purpose of the study. By using fan identification measures, various aspects of sport consumption are examined and the outcomes of these studies are discussed below.

Outcomes of Fan Identification

Fan identification contributes to various aspects of sport consumption behavior. Previous studies found a positive correlation between the level of fan identification and level of enjoyment and emotional arousal (Branscombe & Wann, 1992). Wann, Tucker, and Schrader (1996) also found a strong positive correlation between the level of fandom and understanding sport terminology. Such findings are an example of how fan identification influences fans' cognitive behaviors. However, outcomes or consequences of fan identification are far more complex than just simple observed fan behavior. The complex consequences of sport fan identification are examined next with studies that

quantified outcomes of fan identification from various angles. Understanding the outcomes of fan identification is beneficial as it dictates how fans will behave (i.e., adopt or resist technology) in order to achieve their sport needs.

Stevens and Rosenberger (2012) explored the Australian National Rugby League (NRL) to determine whether involvement, following sport, and fan identification influenced fan loyalty. The researchers employed scales from three different studies (Gladden & Funk, 2001; Mael & Ashforth, 1992; Shank & Beasley, 1998) to survey 484 Australian fans attending home games of NRL teams. The researchers constructed a model by using AMOS 18 to conduct a maximum-likelihood path analysis. The major findings of this study indicated that fan identification, following sport, and involvement positively influenced fan loyalty. In other words, high identified fans of NRL teams who followed rugby by attending the games and were actively involved in the fan community were more likely to become a loyal fan of NRL games. In addition, following sport positively influenced fan identification. For example, a fan who actively follows NRL games on television would most likely become a high identified fan of NRL games. Fan identification also directly influenced fan loyalty. In fact, if a low identified fan becomes a high identified fan due to increase of interest in the game, the fan's level of loyalty would also increase. Based on these main findings, the researchers recommended the NRL teams to find creative ways (e.g., using social media sites) to encourage fans to become more involved and follow rugby more frequently. Additionally, by acknowledging the fact that sport fans are not born as loyal fans, the researchers emphasized the importance of enhancing the current fan identification of NRL consumers.

Another study that examined fan identity was conducted by Gray and Wert-Gray

(2012). The researchers examined sport fans' retention based on team identification and team performance. Specifically, the study focused on the impact of team identification on fan consumption behaviors. Team identification highly influences fans' sport consumption behaviors, and this study examines that aspect. Similar to fan identification, team identification represents fans' emotional and psychological attachments and personal commitments (Gray & Wert-Gray, 2012). The researchers collected the data from 300 college students by adopting and modifying the instrument from Trail and James (2001) and Matsuoka et al. (2003). The instrument was developed to measure psychometric properties of fans as they related to satisfaction and consumption behavior. For example, adopted items included "I will purchase the team's licensed merchandise" and "I will tune into the team's games through television, radio, the Internet, or other media." The findings from this study indicated that team identification had a greater impact on sport consumption behavior in regards to in-person attendance, media-based attendance, purchase of team merchandise, and word-of-mouth communication. Teams that can create a close relationship with fans who are high identified with the team will enjoy the benefit of increase in merchandise sales, attendance, and communication. Furthermore, the results suggested that high identified fans are unlikely to be influenced by the outcome of team performance. The fans who consider themselves as high identified with the Cincinnati Reds will support the Reds regardless of the team's wins and losses. Similar to the suggestions of the above study, it is important for teams to create a special bond with fans as this relationship creates loyal fans who are high identified with the sport.

In addition, Levin et al. (2008) examined fans' purchase intentions towards the

sponsor of NASCAR events. According to this study, NASCAR fans are generally considered loyal fans that supported various sponsors in the past. Using social identity theory as a framework, this study specifically focused on the relationship between fan identification and purchase intention from the current and past sponsors. Based on the results, NASCAR spectators were high identified fans who followed the sport using various types of media (i.e., television, radio, Internet). Similar to high identified college football fans that showed positive attitudes toward sponsors (Gwinner & Swanson, 2003); NASCAR fans also indicated a positive correlation between NASCAR Fan Identification (NFI) score and purchase intention. For example, high identified fans of NASCAR are more likely to purchase from sponsors of the event, whereas low identified fans are less likely to purchase from the sponsors. On the other hand, perceived group norms among fans were found to be a significant predictor of intention to purchase less from the past sponsors. In fact, many NASCAR fans perceive themselves as a part of the NASCAR family and demonstrate group behavior among fans. For example, if a fan stops drinking Gatorade because they are no longer a NASCAR sponsor, other fans may show the same type of behavior. Avoiding the products from past sponsors is perceived as an acceptable behavior among the NASCAR family. Furthermore, high identified fans of NASCAR shopped more with current sponsors when compared to sponsors of the past. This study demonstrates the consumption behavior of loyal fans who make every effort to support NASCAR. Thus, the sponsors should evaluate the characteristics of the fan base when determining events to sponsor in the future (Levin et al., 2008).

Furthermore, Hu and Tang (2010) examined the relationship among viewing motivations, fan identification, and viewing behavior of baseball games on television.

The study focused on the effect of fan identification on viewing behavior. To address the research purpose, the study sampled 800 MLB fans in Taiwan. The study adopted and modified SFMS to include open-ended questions to determine frequency and length of viewing time. Using fan identification as a mediator, this study explored the relationship between fan motivations and viewing behavior. Considering fan identification as a strong predictor of sports fan consumption behavior, the researchers hypothesized that Taiwanese MLB fans who are motivated by certain attributes will be highly influenced by their fan identify to watch more games through television. The result of this study indicated that entertainment, self-esteem, and eustress (i.e., positive level of stress) positively affected fan identification, which was measured by the length of viewing time. Affected fan identification stimulated length of fans' television viewing time. The study supported the researchers' initial hypothesis. Thus, respondents of this study demonstrated that the more they perceived MLB games to be entertaining, the more fan identification was influenced and thereby increased length of watching MLB games on television (Hu & Tang, 2010).

In line with Hu and Tang's (2010) study, Wann, et al. (2013) examined predictors for watching televised sport programs. The researchers expanded the previous study by examining six different types of televised sporting events. The six types consisted of events (a) involving a favorite team, (b) involving a moderately supported team, (c) involving a rival of a favorite team, (d) involving neither a rival nor a preferred team, (e) sport news shows, and (f) sport documentaries. The predictors of time spent on viewing the six types of events were sex, team identification, sport fandom, and involvement in fantasy sports. The survey instrument contained five sections with one

section consisting of open-ended questions that listed six types of events. For the open-ended question section, the study asked respondents to indicate total viewing percentage of sporting events watched in the last seven days with the percentage equaling 100. The instrument used for the other sections of the study employed scales from Sport Fandom Questionnaire (SFQ; Wann, 2002) and SSIS (Wann & Branscombe, 1993) to examine responses from 448 students. Major findings from this study revealed that games involving a favorite team and sport newscasts accounted for 40% of the variance in viewing time. The participants also indicated that they spent more time watching their favorite team than rival teams. Additionally, team identification predicted the amount of time spent on sport television viewing. However, inconsistent with the previous study (Hu & Tang, 2010), the level of fandom did not predict the amount of time spent on sport television viewing. Furthermore, male students were found to spend more time watching sport news programming and sport documentaries than female students. Overall, the respondents of this study indicated that sport fans watch sport on television for different reasons. For example, some of the University of Louisville (U of L) basketball fans may follow only the U of L team, while other fans may follow both University of Kentucky (rival) and U of L games. The result of this study again suggested that each sport fan is different (Wann, Grieve, Zapalac, & Pease, 2008).

Another media-related study examined parasocial interaction between fans' favorite athletes and fans' emotional attachment to their favorite team (Sun, 2010). More specifically, the study explored the antecedents and consequences of sport fans' parasocial interaction with their favorite athletes and teams. In the study, parasocial interaction is a one-sided interpersonal relationship in terms of how one establishes a

relationship with media character. For example, a golf fan following Tiger Woods on television will develop his or her own identification with Tiger Woods and affiliate with him. Such interaction could promote attitudes and beliefs such as proper eating habits or dressing style. Rubin and Perse (1987) indicated that such interaction can be influenced by psychological factors such as perceived realism (as cited in Sun, 2010). This study examined parasocial interaction, and employed fans' personality traits such as emotional instability, agreeableness, extrovertedness, openness to experience and conscientiousness (i.e., big-five traits). In addition, the other major component of this study, team identification, was defined as a fans' degree of attachment to their favorite team. In order to assess the relationship, 199 undergraduate students completed a survey that was mainly based on SSIS (Wann & Branscombe, 1993), and the parasocial interaction scale (Rubin, Perse, & Powell, 1985). The results from this study failed to support the existence of a relationship between fans' personal characteristics and team identification. However, emotional instability related significantly to parasocial interaction. For instance, the more emotionally unstable participants were, the more likely they could develop relationship with athletes. Additionally, the participants would use avoidance strategies to deal with stressful games. It is noteworthy that the non-significant relationship observed in this study was one of the few not consistent with previous studies that found positive relationships between fan identification and favorite teams (Donavan et al., 2005; Wann, Dolan, McGeorge, & Allison, 1994).

Theodorakis, Wann, and Weaver (2012) also observed a mediating relationship between fans' team identification and behavioral intentions to demonstrate the outcome of fan identification. The researchers combined SSIS (Wann & Branscombe, 1993) and

Team Identification Scale (TIS; Dimmock & Grove, 2006; Theodorakis, Dimmock, Wann, & Barlas, 2010) to assess overall identification of a fan. Theodorakis et al. (2012) first proposed a model called the antecedent model, predicting antecedents such as cognitive, personal evaluative, and perceived others evaluative. The model proposed that these variables will be mediated by the overall team identification, which, in turn, influences behavioral intention. Another way to think about this model is by viewing it from a fan's perspective. For example, a fan's perception of service quality (personal evaluative) acts as an antecedent to how the fan identifies with other fans and how they collectively behave as fans. The researchers tested the antecedent model using series of regression analysis to reveal that overall identification fully mediated the relationship between antecedents of identification and behavioral loyalty. In other words, increasing levels of team and fan identification by antecedents such as changing the perception of team's value encourages loyal fan behavior (Theodorakis et al., 2012).

Social Identity Theory and Fan Identity

In order to further understand fans' behavior based on individuals' identification, recent studies have examined fan behavior (Brown et al., 2013) and fan motivations (Uhlman & Trail, 2012) by combining both social identity theory and fan identification as a framework. Brown et al. (2013) examined Ultimate Fighting Championship (UFC) fans' attitude towards athletes and the organization, and determined how fandom affects one's identification with athletes and organization. The researchers conducted a quantitative study and categorized participants' identification in either the high, medium, or low category based on either their identification towards a specific fighter or towards the UFC organization. The most high identified fans for both organization and individual fighters

were within the youngest (18-24) and oldest (35+) demographics. The major findings of this study suggest that demographics (age and gender) were a stronger predictor for identification towards athletes more than how fans were classified (low, medium, high). This finding was inconsistent with studies that indicated fan identification as the strongest predictor for fans' sport consumption behavior. One of the possible reasons for this outcome may be explained through the social identity theory. One could have multiple identities and depending on how the fans perceive their salient identity (Laverie & Arnett, 2000), the level of fanship may become irrelevant. For example, if the UFC fans identify more with fans of their age group than their fan identification, the outcome of this study would suggest that demographics represent a strong predictor. However, UFC fans in the study were highly attached to the sports and enjoyed the feeling of being part of the group. The excitement driven by belonging to a group supported the concept of fan identification in the previous study (Branscombe & Wann, 1992). The respondents in this study demonstrated behaviors that can be examined from both the social identity theory and fan identity perspectives. As with other studies, high identified fans purchased more of the UFC merchandise and pay-per-view events when compared to medium and low identified fans. Furthermore, the purchase behaviors for all three groups of fans were significantly different, supporting previous literature that examined fan identification (Wann & Branscombe, 1993; Wann et al., 1999; Wann et al., 2002).

Another study that examined both social identity theory and fan identification was the case study conducted on the Seattle Sounders Football Club (Sounders FC) season ticket holders (Uhlman & Trail, 2012). The researchers proposed a theoretical model based on previous literature suggesting that vicarious achievement, attachment to

community, and sport attachment were influential factors for team identification (Fink, Trail, & Anderson, 2002; Trail, Robinson, Dick, & Gillentine, 2003). In addition, Uhlman and Trail (2012) examined the relationship between team identification and the Sounders FC fans' perceived superiority. To validate the model, the researchers conducted the empirical study by sampling 328 Sounders FC season ticketholders. The results from this study indicated that the relationship between team identification and the aforementioned three factors was significant. Sport attachment, attachment to community, and need for vicarious achievement explained 70.6% of the variance in team identification, and team identification explained 30.8% of the variance in fan superiority. For respondents of this study, being supportive of the geographic location Seattle combined with their passion towards soccer and the superior performance in Major League Soccer influenced the levels of their identification towards the team. In addition, highly identifying with the team influenced fan superiority to motivate them to purchase season tickets. Similar to UFC fans in the Brown et al. (2013) study, levels of team identification were not the primary motivations to become a loyal fan. Again, referring back to social identity theory, perceptions of fans could vary depending on what they perceive as a salient identity (Uhlman & Trail, 2012).

Moreover, Donovan et al. (2005) examined the influence of personality traits on fan identification. By examining fan identification based on the social identity theory, the researchers divided one's social identity into units to examine how personality traits influence one's sport identification. The relationship between personality traits and fan identification was identified in this study by using a need for affiliation as a mediating variable. A person's need for affiliation is the desire to interact with others by becoming

socially affiliated, and this variable is grounded in social identity theory. For example, sport fans desire to be a part of a club or team to share their opinion and passion towards sport with others who share the same interest. The researchers hypothesized that fan identification is positively related to a need for affiliation based on previous findings from Wann and Branscombe's (1993) study. To further examine the relationship, this study examined eight personality traits: (a) extraversion, (b) agreeability, (c) need for arousal, (d) stability, (e) need for body resources, (f) materialism, (g) openness, and (h) conscientiousness. Using a quantitative method, the researchers sampled 177 college students enrolled in upper-division business courses. The results from this study revealed that an individual's personality traits (extraversion, agreeability, need for arousal, materialism) predicted a need for affiliation. A need for affiliation also related positively to fan identification. Therefore, the participants in this study indicated that their personality affected the desire to belong to a group, which in turn affected fan identification. For instance, a cyclist who has sympathetic characteristics would be more likely to join the local cycling club to ride with others on the weekend. The affiliation with the local cycling club would encourage the cyclist to become a loyal fan of cycling. In other words, the cyclist's personal characteristics could influence him or her to become an avid fan, but will also be highly encouraged by others who belong to the same group. Therefore, a marketing campaign that would stimulate an individual's personal trait such as need for arousal would stimulate a need for affiliation to increase loyalty of a fan (Donavan et al., 2005).

The studies discussed in this section had mixed results depending how they were framed around their theories. Inconsistent with findings from fan identification literature

that indicated level of fandom affected consumption behavior, Brown et al. (2013) and Uhlman and Trail (2012) determined that fans' sport consumption behavior heavily depended on how they perceived their identity. In fact, the two studies, which suggest that one's identity salience and self-concept influence how sport fans behave, were more consistent with social identification theory. In addition, Donovan et al.'s (2005) study related closely to social identity theory in that the personal traits mentioned in the study may highly influence how sport fans identify themselves in terms of their social environment. The studies, however, were consistent with research noting that sport fans are different depending on sport, event, personality, needs, and other attributes that contribute to the difference. Overall, researchers examined these theories in attempt to understand why sport fans behave and act in certain ways in order to determine the relationship between fans' identities and their behaviors. Understanding this relationship is beneficial, especially for sport marketers in order to maximize market responses and customer satisfaction.

Fan Identification and Technology Acceptance

Stewart et al. (2003) noted "the desire to understand the behavior of sport consumers has been a long-standing goal" for marketers of any field (p. 206). In general, marketers take into consideration that no two individuals are alike. However, marketers also understand consumers who purchase the same products may share some of the attributes that could lead to similar outcome behaviors. Thus, individual consumer units are often segmented into groups to better gauge consumers and understand their consumption behaviors to achieve desired marketing goals (Sutton et al., 1993). In sport, one of the ways to understand consumer behavior is by examining one's level of fan

identification (Sutton et al., 1997). Depending on how each individual is categorized, similar behavioral patterns are expected to be observed. On the other hand, in technology, consumer behavioral patterns are explored through the intention of consumers to determine how likely customers are going to accept or adopt technology (Davis et al., 1989).

With the growing trend of mobile networks and portable devices (e.g., laptop computer, smartphone, tablet, iPad), sport consumers who took part in media consumption demonstrated different types of lifestyles and behaviors (e.g., fantasy football participation; Dwyer, & Kim, 2011). For example, a middle-aged sport fan may have experienced recording the Super Bowl on a Video Home System (VHS) tape and then transferring it onto a Digital Versatile Disc (DVD) as VHS players started to disappear. Currently, he may be recording Super Bowl games on his Digital Video Recorder (DVR) or watching them live on a laptop computer or smartphone. The Super Bowl watching aspect of behavior stayed the same over the years, but the medium used to consume sport continued to change. It is important to note the changes in technology mediums, as they may eventually influence consumers' overall behavior (e.g., mobile TV; Jung et al., 2009). In fact, sport fans no longer stay home to wait for their favorite teams to play on television, unless by choice. A majority of the games are broadcast instantly on the web, and could be accessed through personal portable devices anytime from nearly anywhere (e.g., smartphone, portable television). Sport fans also follow their favorite athletes on social media sites and tune into sports news as soon as new information is released (Witkemper, Lim, & Waldburger, 2012). As noted previously in the chapter, high levels of involvement in sport translate to behaviors such as attending sporting

events, playing sports games, and searching for sport-related information (McGehee et al., 2003). In detail, high identified fans were found to view more sports on television (Hu & Tang, 2010; Sun, 2010; Wann et al., 2013), and follow teams on the Internet (Hur et al., 2011a; 2012) when compared to low identified fans.

The advance in technology has allowed people to easily and instantly connect with sport information, fans, teams, and organizations. Furthermore, changes in technology mediums have allowed fans to consume more sport conveniently with minimum effort. Yet technology is only useful when people take advantage of the usage. Prior to usage sport fans must have positive perceptions towards technology in order to accept and take an advantage of the convenient functions (Jiang, 2009). For example, owning a smartphone does not automatically allow sport fans to consume more sport information. The fans would need to initiate an action (e.g., download the *ESPN Radio* app) to make the smartphone function useful for their needs. On the contrary, fans may feel technologically challenged to adopt new technology to consume sport. Such fans will resist to change, and will continue to consume sport using alternative media such as television and newspaper, the media they feel comfortable using (Sanford & Oh, 2010).

When considering today's sport consumption behavior, it is important to take into account that there is an overlap between sport consumers and technology consumers. Also, sport consumers are potential technology consumers and technology consumers are potential sport consumers. Previous studies that examined technology consumption behavior in sport focused on identifying reasons for fans to use technology (Dwyer & Kim, 2011; Hardin et al., 2012; Hur et al., 2007; 2011a; 2011b; 2012; Seo & Green, 2008; Witkemper et al., 2012). However, as mentioned previously, not all sport fans are alike

(Sutton et al., 1993), and by taking that into consideration, gaps in the literature exist in terms of determining how fan identification contributes to fans' sport consumption behavior using the newest technology. Considering the distinctive technology consumption behavior and the unique fan behavior, it is important to comprehensively understand how fans' identification levels influence technology intentions, and in turn affect sport consumption behavior.

Summary of Literature

Whether sport or technology, one's consumption behavior is a "self-defining phenomenon" (Stewart et al., 2003, p. 212), which involves the complex nature of human behavior. In general, understanding one's intention and behavior is difficult considering each individual is cognitively, affectively, and behaviorally different (Stevens & Rosenberger, 2012). Additional attributes considered are one's level of motivations, perception, attitudes, and beliefs to further understand why consumers demonstrate such behaviors (Fishbein & Ajzen, 1975; Trail & James, 2001; Wann et al., 2008). The studies examined in this chapter support that consumers are not homogeneous (Stewart et al., 2003). In fact, sport fans and technology adopters each experience a wider range of psychological, behavioral, and emotional stages leading to different consequences depending on how they identify themselves in the society (Lam et al., 2010; Laverie & Arnett, 2000).

Subsequently, following different consequences, consumers will demonstrate distinct outcome behaviors (e.g., overspending, showing anger). The fan identification process allowed marketers to quantify fans into different groups to further understand fans' sport consumption patterns across consumers with different profiles (Hur et al.,

2011b; Lee et al., 2010; Sutton et al., 1997; Wann, et al., 2008). Understanding the difference between groups of fans' consumption patterns will benefit marketers in bridging the gap between sport and technology consumption as consumers are capable of belonging to both consumption categories. In other words, highly identified sport fans may also be technologically savvy and consume sport using their favorite personal device. Therefore, it is important to examine consumers in both fields to further understand their consumption patterns and underlying reasons (i.e., consumption and resistance) for consuming sport and technologies.

To bridge the gap theoretically, researchers need to take a holistic approach towards understanding sport fans' thought processes, capturing their perceptions that lead to intentions and motivations to use new technologies. The studies in this chapter generally noted that capturing users' perception is the key to understanding their intention to adopt technology. Yet, studies addressing technology use in sport failed to establish the connection between the users' perceptions, intentions and motion. Based on the literature review, it is evident that the frameworks of the technology consumption models complement each other, as the perception constructs in the TRA and TAM expand the motivations factors from the MSSOC. In other words, the perceived usefulness in TAM could be further explained with the information dimension in MSSOC (Kang et al., in press). Thus, in order to understand users' decision making processes in depth, the relationship between the concepts should be considered as a whole.

Another way to address the limitations from previous studies is by examining both motivations and constraints related to new technologies. As mentioned above, users' resistant behavior towards technology does not result from users' lack of motivations, but

derives from a variety of reasons (e.g., privacy concerns) constraining the users from adopting the technology. The literature reviewed in this chapter predominantly focused on addressing either the motivations or constraints. Considering both factors separately fails to provide a comprehensive view towards understanding the full scope of technology adoption processes, as favoring one side of the users' decision making processes may skew the results. Furthermore, technology motivations and constraints will be different for various technology mediums as they each serve specific purposes and functions. For example, smartphone users purchase an iPhone to gain constant access to the Internet, while iPod users may solely focus on listening to music while on the move.

Considering the limitations from previous studies, this study will expand the theoretical framework of previous literature by exploring the full scope of sport fans' decision making processes to adopt smartphone technology. Furthermore, this study will explore how sport and technology consumptions are related by the influence of fan identification. Sport fans are unique individuals as they each connect differently with their favorite teams or sports. This study will explore the unique individual's perspective from various angles to capture information that is necessary to take an advantage of current technology in order to further engage and satisfy sport fans.

CHAPTER III

METHOD

This chapter will discuss the research methods used to address the purpose and research questions of the study. Specifically, this chapter focuses on the research design, study participants, sampling procedure, data collection procedure, instrumentation, and data analysis.

Purpose

The purpose of this study was to understand the relationship between technology and sport by exploring sport consumers' motivations and constraints associated with their smartphone usage. Smartphone usage refers to individuals' use of smartphones to search, receive, disseminate, discuss, and share sport information as well as conduct sport activities by using smartphone functions (e.g., sport-related apps, mobile browser, timer, scheduler). By understanding sport consumers' motivations, constraints, and perceptions related to technology usage, sport managers will be able to develop strategies to spur sport fans' motivating factors and address constraints to establish effective communication channels with fans. In addition, understanding unique fan behaviors based on fan identification will provide helpful insights for sport managers and technology developers attempting to reach consumers with different levels of fan identification. The study (a) examined primary communication channels where smartphones are used, (b) determined factors that influence users to consume sport using

smartphones, (c) determined factors that prevent users from consuming sport using smartphones, (d) determined technological perceptions that encourages users to consume sport using smartphones, and (d) examined factors that predicted sport consumers' actual smartphone usage, and (e) examined the differences in behavior to follow sport based on sex, age and fan identification.

Research Questions

The study addressed the following research questions:

RQ1: What communication channels (e.g., sport-related apps, social media, mobile web browser, texting) do sport consumers utilize the most in order to follow sport using their smartphone?

RQ2: What motivational factors drive sport consumers to use their smartphones to consume sport?

RQ3: What constraining factors hinder sport consumers from using their smartphones to consume sport?

RQ4: What technological perceptions encourage users to consume sport using their smartphones?

RQ5: Are sex, age, and fan identification significantly related to a linear combination of three factors of motivations?

RQ6: Are sex, age, and fan identification significantly related to a linear combination of three factors of constraints?

RQ7: Are sex, age, and fan identification significantly related to a linear combination of two factors of technological perceptions?

RQ 8: Are sport consumers' motivations, constraints, and technological

perceptions significant predictors of smartphone usage for following sport?

Research Design

To address the above research questions, this study incorporated a cross-sectional survey design. Cross-sectional studies are often employed in exploratory studies to make inferences about a population at given point in time (Babbie, 2010). Cross-sectional survey design is also helpful in examining “current attitudes, beliefs, opinions, or practices” (Creswell, 2011, p. 377). Considering the exploratory nature of the study, as it is one of the first to comprehensively examine sport fans’ consumption behavior related to smartphone usage, a cross-sectional survey design was most appropriate. A cross-sectional survey design offers several advantages and disadvantages. The greatest advantages are the ability to describe the characteristics of a large population and the capability to make descriptive assertions about the population by using probability sampling and standardized questionnaires (Babbie, 2010). Flexibility is another advantage of the design as a researcher may ask many questions on a research topic to have flexibility for analysis when compared to experimental design (Babbie, 2010). On the contrary, the design may be inflexible as the study design remains unchanged while field research may be able to discover emerging new phenomena (Babbie, 2010). Additionally, standardized questionnaires may be limited when describing complex topics (i.e., attitudes, experiences, orientations) as the items will represent the mean scores of participants’ responses (Babbie, 2010). Researchers examining sport consumption behaviors using the latest technologies have commonly employed survey design to capture sport fans’ decision making processes (Clavio & Walsh, 2013; Dwyer & Kim, 2011; Hardin et al., 2012; Hur et al., 2012; Seo & Green, 2008; Witkemper et al.,

2012). Furthermore, survey design is widely used for studies examining outcomes of fan identification (e.g., Gray & Wert-Gray, 2012; Steven & Rosenberger, 2012; Wann et al., 2002).

Study Participants

The current study investigated sport consumers' experiences with using their smartphones to follow sport. Specifically, this study focused on sport fans who are smartphone users and explored factors that influence these fans' sport consumption behavior. With the introduction of the iPhone in June 2007 (Apple, 2014), sport fans experienced the first mobile phones with a multi-touch interface. The introduction of the smartphone changed the way sport fans obtain sport information by providing instant access to online information. Today, more than half of American surpassing 164.2 million people own smartphones including sport consumers (comScore, 2014). More than 45.7% of those sport consumers use smartphones to access sport content (Tode, 2014). During the recent 2014 FIFA World Cup in Brazil, 68% of the soccer fans indicated that they shared the excitement of the game using social media through their smartphone (Goldberg, 2014). As smartphone use continues to grow, it is critical to understand how new technologies are shaping the way sport consumers access, watch, communicate, and interact with their favorite sport, teams or players. Following the research aim, sport consumers who self-identified as fans of sport and owned smartphones represented the target population for this study. In order to identify motivational and constraining factors, and technological perceptions related to sport consumers' experience using smartphones, the target population was considered adequate to address the research questions of the current study. Targeting sport consumers who are smartphone owners regardless of their

smartphone usage for sport was meaningful in that it provided great insights for sport managers to understand how sport fans' way of connecting with sport evolved with the latest technology. Targeting all self-identified fans who own smartphones also allowed the researcher to examine those who use smartphones and those who choose not to use smartphones for following sport.

In this study, the sample was drawn from the survey population of registered Amazon users in the United States. Amazon, Inc. established Amazon Mechanical Turk (MTurk), which is an online service where requesters are able to hire temporary workers to complete the jobs or tasks requesters want workers to complete (Amazon Mechanical Turk, 2014). Approximately more than 500,000 participants (workers) from 90 different countries are registered users of Amazon MTurk, and are able to participate and complete work tasks of their choice using their computers or smart devices. The tasks on MTurk may include transcribing, identifying objects in a photo or video, researching data, completing surveys, and more (Franzen, 2013). Among the registered workers, approximately 100,000 workers are considered active, meaning that they collect MTurk grants or payments on a monthly basis (Amazon, 2014). The MTurk allows requesters to hire a large temporary workforce while participants are able to earn money deposited to their Amazon.com account by completing an assigned task. From the requesters' perspectives, MTurk allows them to target a certain population or filter participants for a specific qualification prior to hiring the workers online. For instance, researchers have the option to only select A+ rated workers who earned their reputation by receiving at least a 95% approval rate from previous researchers who collected responses from them. Additionally, an option could be selected to check the participant's IP address to avoid

duplicate survey responses from participants.

Participants can receive a payment of \$0.30 for their work. However, Buhrmester, Kwang, and Gosling (2011) conducted experiments with MTurk workers and reported that the compensation rates do not affect data quality. In fact, the data were at least as reliable as those obtained by using a traditional method (i.e., paper survey). The demographics of MTurk workers consist of more than 50% of the users from the United States between the ages of 21 and 35 years old (Ipeirotis, 2013). Moreover, researchers at MIT, Yale, and Cal-Berkeley reported the MTurk population closely matched the U.S. population (Obal, 2014).

Since the MTurk population accurately represents the U.S. population, this means of data collection offers a convenient option to reach a greater number of survey participants when compared to a student population or respondents from a specific region. For this reason of accessing a more demographically diverse population, studies in psychology, economics, and management fields employed representative samples from MTurk workers (Buhrmester et al., 2011; Horton Rand, & Zeckhauser, 2010; Paolacci, Chandler, & Ipeirotis, 2010). Recently, researchers in sport have surveyed MTurk workers to examine sport tourists (Shim, 2013) and physical activity policy (Hipp, Pless, Adlakha, Chang, & Eyler, 2012). The MTurk population has also provided helpful information for sport marketers when surveying sport fans who use digital and social media content (Dylewski, 2014). Similar to the previous studies, the MTurk workers may closely reflect the current study's target population since they are considered to be among the tech-savvy group having frequent access to online services using their computers or smartphones (Christenson & Glick, 2013). Thus, considering the nature of the study that

explores the latest technology use, reliable (A+ rating) and tech-savvy online-based workforces were expected to provide helpful information to address the purpose of this study. The advantages of surveying MTurk workers are discussed in detail in the following section.

Sampling and Data Collection Procedure

This section will discuss the sampling and data collection procedures in detail. Following the research aim, a purposive sampling method was employed to examine individuals' sport consumption behavior using their smartphones. According to Creswell (2011), probability sampling, including simple random sampling, systematic sampling, stratified sampling, or multistage cluster sampling is the most rigorous form of sampling methods in quantitative research as the sample is representative of the population. However, when probability sampling is not feasible, Ary, Jacobs, Razavieh, and Sorensen (2009) suggest non-probability sampling as an effective method, including convenience sampling, purposive sampling, and snowball sampling. Previously, a purposive sampling method was commonly used in studies examining sport consumption behavior (Gray & Wert-Grey, 2012; Lock et al., 2012; Potter & Keene, 2012; Stevens & Rosenberger, 2012). The purposive sampling method is particularly useful when targeting specific groups or types of people who share common characteristics (Black, 1999). With the purpose of exploring specific population, the participants met the following inclusion criteria: (a) over the age of 18, (b) self-identified sport fan, (c) smartphone owner, (d) reliable online respondent (i.e., A+ rated MTurk worker), and (e) resident of the United States.

When examining the technology use of sport consumers, various studies often

employed a purposive sampling method to select participants who meet their proposed inclusion criteria (e.g., Clavio & Walsh, 2013; Hardin et al., 2012; Hur et al., 2007; 2011a; 2011b; Witkemper, et al., 2012). For example, Clavio and Walsh (2013) used a purposive sample of college students meeting the inclusion criteria of being a college sport fan and social media user to understand their online participation motivations. Moreover, recent studies concerning smartphone usage often utilized MTurk for survey research (Duff, Yoon, Wang, & Anghelcev, 2014; Kelley, Cranor, & Sadeh, 2013; Schaub, Seifert, Honold, Muller, Rukzio, & Weber, 2014; Thakur, Gormish, & Erol, 2011). For instance, Duff et al. (2014) collected data from MTurk representing a national consumer population to understand media multitasking behavior. Similarly, Thakur et al. (2011) surveyed MTurk workers to understand how they used their smartphone for job purposes. One of the primary reasons for researchers to conduct smartphone studies on MTurk is because many workers are able to access surveys using their mobile browsers. Considering previous studies and the exploratory nature of the study, using the purposive sampling method to collect data from the A+ rated MTurk workers who reside in the United States was appropriate.

While the sampling method is important, sampling bias may raise concerns. In this regard, it is important to note that the current study captures information regarding sport consumers' smartphone experiences, making it necessary to sample the individuals who are current sport fans and smartphone consumers. In order to ensure the sample is representative, the researcher took additional steps beyond the data collection procedures mentioned above. As noted above, MTurk population has been reported to closely reflect the U.S. population (Obal, 2014). The researcher collected the demographic information

of the samples and compare them with the survey population of previous studies addressing sport fans' technology usage (i.e., Kang et al., in press) and studies examining MTurk population (i.e. Bates & Lanza, 2013). In addition, the researcher compared responses of early and late respondents to evaluate the quality of the data. The comparisons were analyzed using one-way Analysis of Variance (ANOVA). These steps helped to ensure the sample is representative in order to generalize the findings from the sample data to the target population of sport fans who own smartphones.

One of the greatest advantages of disseminating the survey through MTurk is the fast response time. In a recent study, Ha, Kim, Kang, and Park (2014) compensated subjects \$0.50 per 20 minute survey and collected 482 usable surveys within a 60 hour (8 participants per hour) period. Buhrmester et al. (2011) also collected 500 responses in 33 hours (15 participants/hour) by offering \$0.02 for a two-item survey. Although MTurk response rates depend heavily on the length of the task and compensation, MTurk provides alternative ways to combat low response rate concerns for online surveys. In the case of low response rate, the researcher had a plan to increase the incentives ten days following the initial post on MTurk.

Each participant received a survey with five main sections: (a) demographics (b) motivations, (c) constraints, (d) fan identification, and (e) actual usage. Prior to conducting the survey, participants were asked to answer screening questions to meet the study's inclusion criteria. The screening questions were in a dichotomous format (i.e. yes or no) to include: (a) Are you fan of sports? and (b) Do you own a smartphone? (i.e. iPhone, Android, Windows phone). If participants answered no in any of the two questions, they were excluded from the current study. In addition, the researcher used the

MTurk screening option to make the survey only available to participants living in the United States and A+ rated MTurk workers. The survey was hosted on Qualtrics.com. The site link was provided to MTurk workers, who spent approximately 15 to 20 minutes completing the survey. All the registered workers of MTurk received an automatic notice of the survey posting through their MTurk account and email. All participants were able to email the researcher if they encounter any questions by using an anonymous email function provided through the MTurk site. The incentive listed for MTurk workers could range from \$0.01 to \$20 depending on the length and complexity of the survey tasks. Although Buhrmester et al. (2011) found data quality is not affected by the amount of incentives between \$0.02, \$0.10, and \$0.50, an incentive of \$0.75 for a 30 minute multiple choice survey was found to be reasonable (Barger, Behrend, Sharek, & Sinar, 2011). As for this study, based on Buhrmester et al.'s (2011) finding, approximately \$0.30 was awarded to participants who meet the study's inclusion criteria. Upon meeting the criteria, participants were asked to agree to the informed consent (See Appendix B).

With MTurk in mind, the researcher needed to determine the adequate sample size for this study. One of the ways to determine sample size is by examining the statistical and inferential requirements. In order to address the research questions, this study used combination of Exploratory Factor Analysis (EFA), two-way factorial Multivariate Analysis of Variance (MANOVA), and multiple regression analysis. In regard to EFA, a sample size of 200 is a minimum, 500 is considered very good, and 1000 is considered excellent. To avoid technical problems associated with a small sample size, a minimum of 200 participants is needed for the current study (Stevens, 2009). For the sample size determination for a two-way factorial MANOVA, a G Power *priori*

power analysis was used. A sample size of 110 is needed to achieve power of .80 and medium effect of .25 (Cohen, 1988). Stevens (2009) suggests a minimum of 15 participants per predictor variable. The current study used eight predictors including motivations, constraints, and technological perception variables, requiring a minimum of 120 participants. In addition to conduct calculations based on statistical analysis, a sample size requirement may be determined on the basis of sampling error. According to Dillman (2007), a sample size of 383 is needed for a population of 100,000 (currently active MTurk workers) to achieve 95% confidence level with a $\pm 5\%$ margin of sampling error. The researcher will make an effort to exceed the minimum sample size suggested by Dillman (2007) to generalize the findings to the target population.

The sampling and data collection method was approved by the Institutional Review Board (IRB) prior to the data collection. All respondents agreed to the IRB requirements by giving consent to participate on a voluntary basis (See Appendix B). The respondents were given an option to discontinue the participation at any point in time and their personal identifier information was deleted (e.g., Amazon user ID). As recommended by the IRB, the researcher stored all data on a password-protected external hard drive to ensure anonymity and confidentiality.

Instrument

The survey included five main sections measuring (a) motivations, (b) constraints, (c) perceptions, (d) fan identification, (e) smartphone usage, and (f) demographic information. The details of the instrument for the following sections are discussed below.

Sport Fans' Technology Motivations

As technology continues to shape the way sport consumers connect with sport information, researchers in sport management have made various attempts to understand how and why technology affects sport consumption behavior. To date, two existing scales exist address smartphone technology in sport. The first scale by Kang et al. (in press) focuses on motivations for smartphone apps specifically, and the second scale by Ha et al. (2014) addresses intention and actual usage of mobile web browsers and sport-related apps. Both scales combined items from the technology acceptance and online sport consumption literature (Davis, 1989; Davis et al., 1992; Hur et al., 2007; 2011b; Seo & Green, 2008), as a scale for measuring sport consumption using smartphone did not exist to address their research purposes. The current study faces a similar issue as the two scales measuring smartphone usage fail to measure motivations, constraints, and perceptions related to smartphone usage. Therefore, the researcher will employ and modify existing scales from the technology and sport consumption literature.

The following six salient motivations were identified to address the sport consumption behaviors using the latest technology: (a) information, (b) social, (c) entertainment, (d) pass time, (e) fanship, and (f) economic (See Appendix A). The scale items were primarily adopted from two studies examining online sport consumption (Hur et al., 2007; Seo & Green, 2008), smartphone usage in sport (Ha et al., 2014; Kang et al., in press).

Motivations scale. Initially, a total of 141 motivation items were generated based on the relevant literature noted above (Davis, 1989; Dwyer & Kim, 2011; Jung et al., 2009; Ha et al., 2014; Hardin et al., 2012; Hur et al., 2007; 2011a; Kang et al., in

press; Seo & Green, 2008; Venkatesh et al., 2003; Witkemper et al., 2012). However, based on an extensive review of this literature, only the items that were most appropriate for the definition of each motive, and showed sound psychometric properties were selected based on their reported reliability and validity coefficients.

The examined scales were in a 7-point Likert-type scale format anchored by 1 = *Strongly Disagree* and 7 = *Strongly Agree*. The wording of the survey items for this study was modified to reflect smartphone usage instead of online usage. For example, three items measuring information motivations were adapted from Hur et al. (2007), which included “I learn about things happening in the sport industry using my smartphone,” “The sport related information obtained from my smartphone is useful,” and “I can get information about various sports such as team performance, player profiles, and game schedules through my smartphone.” The three items effectively capture one’s desire to gather sport information and understand current events, reflecting information motivations for sport fans. Another important factor that influences sport fans is the socialization motive. Hur et al. (2007) discovered that sport consumers desire to maintain human relationships using the Internet to share their common interest. The four items from their study were adapted to examine fans who use smartphones as their primary source of communication. The item included, “I like to chat with people about sports using my smartphone,” “My smartphone provides me a chance to interact with other people about sports,” “I like to share my opinions about sport teams and players using my smartphone,” and “I enjoy debating sport-related issues using my smartphone.” These were used to capture sport consumer’s motive to communicate and socialize with other fans who shared similar interests.

Hur and his colleagues (2007) reported the nine construct online sport consumption scales to be reliable with Cronbach's alpha ranging from .69 (delivery) to .90 (economic). Cronbach's alphas greater than .70 are considered acceptable internal consistency (Nunnally & Bernstein, 1994). For information and social motivations specifically related to this study, they reported Cronbach's alphas of .81 and .85, respectively. Convergent validity is indicated when each item has significant factor loading on its specified factor (Rahim & Magner, 1996). Factor loadings were statistically significant with critical ratios ranging from 6.22 to 18.19 ($p < .05$), supporting convergent validity.

The next three motivations, entertainment, pass time, and fanship, were adapted based on the MSSOC used in Seo and Green's (2008) study. Each of these motivations contained three items for a total of nine items. These motivations were chosen from MSSOC because previous studies examining sport fans' technology usage behaviors (Dwyer & Kim, 2011; Hur et al., 2007; Kang et al., in press, Seo & Green, 2008; Witkemper et al., 2012) indicated these motivations to be most prevalent across the different technologies each study examined. For instance, items adapted for the entertainment motive capture sport fans' experience as they encounter fun and entertaining aspects of sport using their smartphones. An example item includes, "I use my smartphone to follow sport because it is exciting," asking respondents to rate the degree of excitement experienced as a motive for consuming sport. The three items adapted for the pass time motive include items such as "I use my smartphone to follow sport because it passes the time away, particularly when I'm bored," measuring how likely fans will spend their free time to connect with sport using the gadget in their hand.

Moreover, the studies examining sport fans' technology usage define the fanship motive as one of the most important factors in determining fans' decision to adopt and use technology. According to Seo and Green (2008), the fanship motive captures the "reason that one considers oneself a huge fan of particular sports and teams" (p. 86). A sample item for the motive includes "One of the main reasons I use my smartphone to follow sport is that I consider myself a fan (e.g., fan of football, fan of sports games, fan of fantasy football)."

The original MSSOC (Seo & Green, 2008) reported all 10 dimensions to be reliable as Cronbach's alpha coefficients ranged from .77 (escape) to .90 (interpersonal communication). Specifically, the entertainment, pass time, and fanship motivations adapted for this study reported Cronbach's alpha of .86, .81, and .90, respectively. According to DeVellis (2012), Cronbach's alphas between .65 and .70 are considered minimally acceptable, ranging .70 to .80 are respectable, and between .80 and .90 are excellent. The convergent validity was also established as they reported the three dimensions adapted for the study were significantly correlated ($p < .01$) with a measure of Web commitment. The correlation coefficients for the three dimensions were .62 (entertainment), .49 (pass time), and .34 (fanship). According to Nunnally and Bernstein (1994), if the instrument significantly correlates with other measures of a theoretically related construct, the measure is considered to possess convergent validity. Similarly, Hur et al., (2007) reported the nine construct online sport consumption scales to be reliable with Cronbach's alpha ranging from .69 (delivery) to .90 (economic). A significant factor loadings for items ranged from .56 (economic) to .97 (customer service), supporting convergent validity (Rahim & Magner, 1996). Furthermore, discriminant validity is

evident when the estimated correlations between the factors are not excessively high (e.g., $< .85$; Kline, 2005, p. 73). The measurement model only revealed three high factor correlations of .85 between convenience and economic motivations, .96 delivery and customer service, and .96 between product quality and customer service were reported to support discriminant validity (Kline, 2005). The scale of MSSOC was supported to be a valid and reliable measure for sport consumption motivations using technology even when the items are partially adopted (Dwyer & Kim, 2011; Hardin et al., 2012).

Economic is another motive identified as important for fans using the Internet to purchase sport related merchandise (Hur et al., 2007; Seo & Green, 2008). In order to address the purpose of this study, the researcher adapted items from Kang et al.'s (in press) study that examined sport fans' smartphone app usage. Instead of focusing on purchase motivations, the items for economic motive examine value and affordability of a smartphone as a whole. An example item includes, "sport using my smartphone because they are very affordable," capturing sport consumers' motive that derives from economic benefits. Similar to Hur et al.'s (2007) and Seo and Green's (2008) instrument, Kang et al. (in press) reported acceptable range of Cronbach's alphas (DeVellis, 2012) from .65 (economic) to .93 (curiosity) when they tested the internal consistency of the scores.

Sport Fans' Technology Constraints

As mentioned in Chapter Two, studies measuring both motivations and constraints are limited when compared to the number of studies that focused on user motivations. The scales for constraints primarily adapted measures for technology constraints (Lapointe & Rivard, 2005; Watson et al., 2013) and sport consumption

constraints using technologies (Hur et al., 2007; Suh, et al., 2010; Witkemper et al., 2012). The following six salient constraints were identified: (a) time, (b) lack of interest, (c) skill, (d) security, (e) expense, and (f) technology error. The constraints were selected based on their theoretical reasoning to address the purpose of this study. A 7-point Likert-type scale format will also be used to measure sport fans' technology constraints, where 1 = *Strongly Disagree* and 7 = *Strongly Agree*.

Constraints scale. The wording of the survey for constraints scale was also modified to assess participants' smartphone usage. Three items for time constraints were adapted from Suh et al. (2010), which measures the time conflict sport fans face as they make attempts to utilize their smartphone to follow sport. In regards to the scales measuring constraints, Suh et al. (2010) reported Cronbach's alpha coefficients ranging from .65 (time) to .92 (lack of interest), establishing an acceptable reliability level (DeVellis, 2012). All of the AVE measures except for time factor (.39) were greater than .5, supporting convergent validity. According to Hair, Anderson, Tatham, and Black (1998), AVE greater than .50 of the total variance and reliability coefficient larger than .70 supports convergent validity. However, they decided to retain all items for the time factor, as it was a theoretically meaningful construct derived from existing research. One of the items measuring time constraint includes, "I am way too busy to follow sport using my smartphone because of my study or work obligations." Additionally, three items were adapted from the same study for lack of interest constraints. Lack of interest constraints derives from an individual's negative psychological state that influences his or her personal preferences (Suh et al., 2010). The survey questionnaire includes "Using my smartphone to follow sports is not attractive to me" to measure participants' degree of

resistance in regards to their personal preferences.

Another important constraint related to skill and economic was identified by Witkemper et al. (2012). The three items adapted for skill constraints includes, “Following sport using my smartphone is not easy,” “I am not good at certain technical skills required to use my smartphone to follow sport,” and “I do not know where or how to use my smartphone to follow sport.” The items assess if skill is a factor in using a smartphone and whether it would hinder an individual’s ability to use these services to follow sport. The measures developed by Witkemper et al. (2012) also reached acceptable reliability levels by reporting Cronbach’s alpha coefficients ranging from .76 (skills) to .88 (information). All the constructs showed acceptable AVE levels greater than .50 except economic (.49) and accessibility (.43). The two constructs, however, were included in their scale as the measure of constructs provided evidence for convergent validity (intercorrelation for items ranging from .79 to 1.00, $p > .05$) and discriminant validity (correlation between the latent factors below .85). Convergent validity is typically established when measures that should theoretically relate are correlated, and discriminant validity is established when measures that should not be related are not highly correlated (Fields, 2009).

For security constraints, Hur et al. (2007) developed four items measuring the degree of sport consumers’ perceived risk associated with their personal and financial information online. A total of four items were adapted, including the item “When following sport, I am concerned that my personal/financial information on my smartphone might be shared with others without my consent.” These items were relevant to the abuse of personal information, which may discourage individuals from using the

latest technology. As mentioned above, Hur et al.'s (2007) overall measure established reliability including security dimension with Cronbach's alpha of .85. For expense constraints, a total of three items were adapted. The first item, "Using my smartphone to follow sport requires more money than I can spend," was adapted from Witkemper et al.'s (2012) scale. As stated above, Witkemper and his colleagues reported acceptable reliability coefficient of .82 and .49 for AVE. The second item, "The price I pay for the smartphone usage to follow sport (including device, services, apps) are way too high" was adapted from Hur et al.'s (2007) scale. The third item was generated based on the theoretical frameworks and definition of economic constraints (Hur et al., 2007; Witkemper et al., 2012). It was necessary to generate these items as both of the studies solely focus on either a service fee related to following athletes on Twitter or purchasing sport-related products online. In order to address economic constraints for smartphones more specifically, the researcher included an item, "The expense related to smartphone usage discourages me from following sport using my smartphone." Smartphone services require users to have a plan for data, voice, and text use, which may hinder sport fans from using sport services in order to stay within their plan or to avoid additional fees occurring beyond their plan.

Finally, three items were adapted to measure technology error constraints. Two items were "I feel irritated when my smartphone does not work well to follow sport" (Watson et al., 2013), and "Experiencing an error while following sport is a frustrating experience (Lapointe & Rivard, 2005). For the technology constraints measure, Lapointe and Rivard (2005) took a longitudinal case study approach to examine hospital physicians' adoption behavior for an electronic medical record system. They reached an appropriate

degree of internal validity by triangulating direct observation, documentation, and interviews. In case study research, construct validity is often addressed by using multiple sources of evidence (Yin, 1994). The other items from the two scales were not applicable for the current study because they were designed to measure constraints for QR code users (Watson et al., 2013) and users' perception towards IT implementation at a hospital (Lapointe & Rivard, 2005). In order to address the technological aspect of smartphone usage, the researcher included "I feel irritated when my Wi-Fi/3G/4G connections are too unstable to follow sport." According to Watson et al. (2013) smartphone users expressed strong frustration when their mobile handset failed to fulfill their needs. Considering Wi-Fi/3G/4G connections control the major operation of smartphones, this additional item further investigated errors related to online connections in greater detail.

Sport Fans' Perceptions toward Technology

In order to comprehensively understand one's consumption behaviors pertaining to a specific technology medium, the researcher also employed based on literature addressing technology consumption behaviors: (g) curiosity, (h) media multitasking, (i) ease of use, and (j) usefulness (See Appendix A). The scale items were adopted from studies examining relatively new technology mediums (Ha et al., 2014; Kim, Kim, & Kil, 2009; Yang, Lu, Gupta, Cao, & Zhang, 2012), as well as studies examining technology acceptance behaviors (Davis, 1989; Jung et al., 2009).

Technological perceptions scale. As mentioned previously, technology perception constructs were employed to further understand smartphone users' technology consumption behaviors. Originally derived from the perceived curiosity construct (Kim & Kankanhalli, 2009; Yang et al., 2012), items for perception towards curiosity include,

“I enjoy exploring new functions on my smartphone to follow sport” and represent today’s technology savvy sport consumers. Furthermore, a total of six items for technology perception towards ease of use and media multitasking were adopted from Ha et al. (2014) that developed and tested a conceptual model for smartphone usage in sport. Originally, items for the perception towards ease of use were adapted from Davis’ (1989) study. Although perceptions are theoretically different from motivations, the items are considered as they are found to greatly affect individuals’ behaviors to actually use the technology. The items for perception focus on measuring operational aspects of smartphones by asking users to rate the accuracy of the statement, “Learning to operate my smartphone to follow sport is easy for me.”

Davis (1989) developed two constructs (i.e., perceived usefulness and perceived ease of use) with a ten item scale. As mentioned above, studies in the field of technology claimed that such perceptions lead to actual usage in similar ways that motivations affect one’s consumption behaviors (Kim, 2011; Liang & Yeh, 2011; Nasri & Charfeddine, 2012; Tseng et al., 2012). He established reliability for the scale by reporting the Cronbach’s alpha of .97 for usefulness and .91 for ease of use. In addition, convergent validity was tested using multitrait-multimethod analysis (Cambell & Fiske, 1959), revealing statistically significant correlations at the .05 alpha level for both constructs supporting convergent validity. Comparably, Jung et al.’s (2009) scale that modified Davis’ (1989) scale also confirmed convergent validity and reliability for their constructs. Jung et al. (2009) reported respectable Cronbach’s alpha ranging from .78 to .91 and all AVE values over .50 providing evidence for the confirmation. According to Hair et al. (1998), AVE greater than .50 and reliability coefficient larger than .70 supports

convergent validity. Moreover, discriminant validity of the constructs were established as they reported the items to load mainly onto their corresponding constructs with no cross loadings in their EFA results. Based on studies that claimed the scale to be valid and reliable, adoption of the items for smartphone users in this study is expected to reveal similar results. The users' perception towards media multitasking derives from Zhong's (2013) study examining the diffusion of today's mobile media technologies (e.g., tablet PC, smartphone, iPad) as they impact human interaction. Media multitasking is particularly relevant to sport spectators with smart devices as it refers to both multitasking on one's device and multitasking by switching between devices. The scale was adapted from Ha et al.'s (2014) study, which states, "I often find myself using smartphones and other media/devices (e.g., TV, computer, radio) simultaneously to follow sport." Regarding the construct, Ha et al. (2014), reported .77 for the alpha coefficient and AVE of .53 for the construct. Finally, three items for the perception towards usefulness were originally developed by Davis (1989), but adapted from Jung et al.'s (2009) study since they explored adoption of mobile television in a similar manner to the current study. The motive includes the item, "Use of smartphone can assist my fan lifestyle," and also measures the impact of technology in sport fans' daily life. In regards to the perceived usefulness construct specifically, Jung et al. (2009) reported acceptable reliability coefficient of .91 and factor loadings ranging from .81 to .85 for the three items, supporting convergent validity.

Fan Identification

Fan identification measures one's level of psychological and emotional connection he or she establishes with a team or sport (Murrell & Dietz, 1992). As noted

in the previous chapter, multiple scales exist to measure one's level of fandom (i.e., fan identification). Among them, the Sport Fandom Questionnaire (SFQ; Wann, 2002) had been widely used to understand how the individual level of fanship influences consumption behaviors (Melnick & Wann, 2004; Park, Mahony, & Greenwell, 2010; Theodorakis et al., 2012; Wann & Weaver, 2009; Wann, Dimmock, & Grove, 2003; Wann et al., 2008). The SFQ was developed to measure "one's identification with his or her role as a sport fan" rather than focusing on one's connection to a specific team (Wann, 2002, p. 104). This study focuses on sport fans' smartphone usage rather than how they identify with a specific team. Thus, SFQ was selected to measure how smartphone users identify with sports in general. The five-item SFQ in an eight-point Likert scale is often adopted for sport consumption studies as they accurately reflect the definition of fan identification involving one's self-perception as a fan of sport (Wann, 2002).

Sport Fandom Questionnaire. The five items from SFQ were adopted to assess a participant's level of fan identification. The SFQ has shown good internal consistency in previous studies. Wann (2002), Wann et al. (2008), and Wann & Weaver (2009) reported Cronbach's alpha of .93, .91, and .96, respectively. In addition Wann (2002) provided strong evidence for test-retest reliability as the SFQ scores from two of testing sessions in Wann's (2002) study were highly correlated ($r(55) = .94, p < .0001$). The items loaded on a single factor with loading ranging from .926 to .991, supporting convergent validity (Rahim & Magner, 1996). Finally, evidence of convergent validity was reported as the correlation between the SFQ scores and Sport Spectator Identification Scale (SSIS; Wann & Branscombe, 1993) scores revealed a strong positive relationship ($r(109) = .65, p < .001$). The original items include, "I consider myself to be a sport fan,"

“My friends see me as a sport fan,” “I believe that following sport is the most enjoyable form of entertainment,” “My life would be less enjoyable if I were not allowed to follow sports,” and “Being a sport fan is very important to me.” Although the original items were measured using the eight-point Likert scale, the current study used a seven-point Likert scale where 1 = *Strongly Disagree* and 7 = *Strongly Agree*.

Smartphone Usage

Previously, studies examining technology use for sport consumption measured frequency and time spent in use to assess sport fans’ actual usage of the device (Ha et al., 2014; Hur et al., 2007, 2011a, 2012; Kang et al., in press). The frequency of smartphone usage was measured with two items. The first question asked, “How frequently do you believe you use your smartphone for sport consumption (e.g., searching/obtaining sport-related information, watching games, etc.)?” using a seven-point Likert scale where 1 = *Very Rarely* and 7 = *Very Frequently*. For the second question, the respondents were asked, “Given that I have access to my smartphone, I predict that I would use my smartphone to follow sport” in a seven-point Likert scale where 1 = *Very Unlikely* and 7 = *Very Likely*. In addition to the two items, the duration of usage on a typical day were checked by self-reported choices of 0-1 minute, 1-10 minutes, 10-30 minutes, 30 minutes-1 hour, 1-3 hours, 3-5 hours, and more than 5 hours a day. A question asking for intention to use when given access to the smartphone was adopted from Hur et al.’s (2012) study. The intention were measured using a seven-point Likert scale where 1 = *Very Unlikely* and 7 = *Very Likely*. In addition, the researcher collected information regarding the source of communication channel(s) fans used on their smartphone to follow sport. Using a nominal closed-ended question format, participants checked all the applicable

categories among social media, official site (e.g., espn.go.com, nba.com, Yankees.com), push notification, sports fan community, sport-related apps, text, and email. The participants were also asked to identify the sport of their interest by selecting all that are applicable among NFL, NBA, WNBA, NCAA Men's Basketball, NCAA Football, Pro. Men's Tennis, Pro. Women's Tennis, NASCAR, Pro Soccer, and open-ended selection of Others categories. Finally, the researcher asked about the participants' primary purpose of smartphone usage. The participants were asked to select between the following choices: to obtain sport information, to conduct sport activities, and to obtain sport information and conduct sport activities, followed by an open-ended choice of others where they can specify their chosen option.

Demographic Information

In this study, participants were asked to indicate their gender, age, type of smartphone used, level of education completed, household income, ethnicity, and sports interest. The collected information helped the researcher to better understand the survey population of sport fans who use smartphones to follow sport.

Scale Validation

Considering the exploratory nature of the study, as smartphone technology is relatively new and under researched, a series of pretests was conducted to ensure reliability, and validity of the scores, and readability of the instrument. The pretesting procedure followed a series of guidelines suggested by Dillman (2007). First, a panel of experts in the field reviewed the survey items to establish content validity. The experts were chosen based on their research experience in developing survey instruments and their familiarity with the research purpose. Second, a field test was administered to

graduate students across various disciplines at an urban, Midwestern university. The field test only targeted participants outside of this study's population to provide feedback on the overall quality of the scale. In detail, the participants were asked to provide insights into the readability and interpretation of the items, and identify any technical problems with the questions. Third, a small pilot test was conducted using the Qualtrics website with at least 50 undergraduate students who own an Amazon account to represent the MTurk workers.

Based on Dillman's (2007) guidelines, the pilot test helps to (a) evaluate internal consistency of the scores, (b) identify potential issues with the implementation procedures, and (c) identify "nonresponse" items in order to determine whether the scale works as intended. The results from this pilot test allowed the researcher to take additional steps to improve internal consistency and implementation procedures. The reliability of the scale was measured by examining Cronbach's alphas and using the value of .70 as a threshold as suggested by DeVellis (2012). Conducting a series of pretests helped to ensure reliability, validity, and readability of the instrument.

Data Analysis

The collected data were analyzed by using a combination of Exploratory Factor Analysis (EFA), Analysis of Variance (ANOVA), Multivariate Analysis of Variance (MANOVA), and multiple regression to address the eight research questions. The study's research questions examine sport fans' motivations, constraints, and technological perceptions for connecting to sport using their smartphones. As preliminary analysis, the researcher examined descriptive statistics, Pearson product-moment correlations, and Cronbach's alphas. The descriptive statistics, including measures of central tendency (e.g.,

mean, median) and measures of variability (e.g., standard deviation), described the basic characteristics of the data (e.g., independent and dependent variables) in this study. The Pearson product-moment correlations examined relations among the variables to identify potential risk of multicollinearity problems. Multicollinearity problems occur when variables are highly correlated with one another, and usually correlation coefficients greater than $\pm .50$ are considered to be problematic (Field, 2009). Cronbach's alphas were computed to measure internal consistency reliability of the instrument.

In addition to preliminary analysis, the researcher conducted series of Exploratory Factor Analysis (EFA) using SPSS 22.0 to examine the instrument developed to address the purpose of the study. Factor analysis is particularly useful when examining internal consistency of the items, reducing number of items to serve the cause of scientific parsimony, and establishing meaningful factors underlying the construct (as cited in Park et al., 2010). An EFA is commonly performed at an early stage of research to provide insight into the underlying dimensions of a set of variables (DeVellis, 2012).

Prior to conducting an EFA, four assumptions including sample size, multivariate normality, linearity, and outliers among variables were checked (Stevens, 2009). A factor analysis is a large N technique and Stevens (2009) recommends a minimum sample of 200 to conduct an analysis. In addition, multivariate normality was checked by examining normality probability plots. Multivariate normality assumption is met when all the variables and linear combinations of variables are normally distributed. Similarly, linearity among pairs of variables was checked by examining the scatterplots. The outliers among the variables are identified when variables demonstrate a low squared multiple correlation with important factors or with other variables (Stevens, 2009). The

outliers in this study were removed from the analysis.

Additionally, the Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy were reported indicating the data were appropriate for a factor analysis. Upon meeting all the assumptions, principal component extractions were conducted using four criteria to determine number of factors to retain. The four criteria includes: (1) Kaiser's eigenvalue greater than 1.0, (2) Cattell's scree test, (3) the number of item loading on each factor, and (4) the amount of total variance explained by factors (Stevens, 2009). The result from the EFA provided helpful insights into the constructs adapted from various studies (Davis, 1989; Davis et al., 1992; Hur et al., 2007; 2011b; Lapointe & Rivard, 2005; Seo & Green, 2008; Suh, et al., 2010; Watson et al., 2013; Witkemper et al., 2012) to examine sport consumers using smartphones.

The first research questions were addressed using descriptive statistics. To address the first research question (i.e., What communication channels do sport consumers utilize the most in order to follow sport using their smartphones?), descriptive statistics including mean and standard deviation were reported. For the next three research questions, (i.e., What motivational factors drive sport consumers to use their smartphones to consume sport? What constraint factors hinder sport consumers from consuming sport using their smartphones? and What technological perceptions encourage users to consume sport using their smartphones?), descriptive statistics were be reported, and one-way ANOVAs were conducted to identify the factors affecting motivations, constraints, and technological perceptions for smartphone usage. Prior to analyzing the data, the assumptions for ANOVA, including independence, normality, and homogeneity of variance were checked (Stevens, 2009). To meet the independence assumption, the

researcher first ensured independence of the responses by asking participants to only complete one survey and by checking duplication of the Internet Protocol (IP) address of respondents. In addition, the researcher examined the results of Q-Q plots and the data were considered normal as the plots formed closely with the straight line running at a 45 degree angle. Finally, homogeneity of variance was checked using the Levene's test. The researcher looked for a non-significant result indicating no significant differences in variability between groups (Stevens, 2009).

To address the fifth research question (i.e. What differences exist in sport consumers' motivations to follow sport based on sex, age, and fan identification?), sixth research question (i.e. What differences exist in sport consumers' constraints to follow sport based on sex and age?), and seventh research question (i.e. What differences exist in sport consumers' technological perceptions to follow sport based on sex, age, and fan identification?), a factorial between-subject MANOVA was conducted. A factorial MANOVA considered the effects of the three independent variables (i.e., sex, age, and fan identification) and interaction between the three grouping variables on sport consumers' motivations, constraints, and perceptions to use smartphones. A factorial between-subject MANOVA has advantages over one-way MANOVA as the design enables the researcher to examine main effects and interaction effect of the independent variable on a set of dependent variables. According to Stevens (2009), interaction occurs when the "effect one independent variable has on a dependent variable is not the same for all levels of the other independent variable." In other words, the effects of sex on sport consumers' motivations may not be the same for age groups. In addition, MANOVA is a powerful test due to the capability of examining several dependent variables

simultaneously, which helps to control for Type I error by avoiding multiple univariate tests (Stevens, 2009). Considering the advantages of factorial MANOVA, the current study will use a 3 x 3 MANOVA design to examine the group differences and group interaction on motivations, constraints, and perceptions as dependent variables. In detail, three separate factorial MANOVAs were conducted to consider the dependent variables of motivations, constraints, and perceptions, each separately. The researcher employed sex with two levels (i.e., male or female), age with two levels (i.e., Millennials and others), and fan identification (i.e., high, low) as independent variables. The age group were split into Millennial (i.e. 33 and younger), and others (i.e. 34 and older) as Millennials were considered as the most active users in taking advantage of technologies (Shontell, 2014). For the fan identification group, sport consumers were split at the median into two groups based on their fan identification scores. As mentioned above, studies exploring fans' sport consumption behavior supports the significant behavioral differences between the fan identification groups (Stewart et al., 2003; Sutton et al., 1997). Thus, the split allowed the researcher to examine group characteristics (i.e., fan identification) more clearly.

Prior to analyzing the data, the assumptions for MANOVA, including independence, normality, and homogeneity of variance were checked (Stevens, 2009). Similar to ANOVA assumptions above, the researcher first ensured independence of the responses by asking participants to only complete one survey and by checking duplication of the Internet Protocol (IP) address of respondents. In addition, the researcher examined the results of Q-Q plots to check for multivariate normality. The data were considered normal as the plots formed closely with the straight line running at

a 45 degree angle. Finally, homogeneity of variance was checked by examining Box's Test of Equality of Covariance Matrices. The researcher looked for a non-significant result indicating no significant differences in variability between groups (Stevens, 2009). Upon meeting the assumptions, the Wilks' lambda multivariate F statistic were examined for a significant main effect and interaction effect. Statistically significant multivariate F s were further examined using ANOVAs for each dependent variable. The value obtained for partial eta square were also be reported for variance in each dependent variable accounted for by the independent variables.

To address the eighth research question (i.e., How do sport consumers' motivations, constraints, and technological perceptions predict smartphone usage to follow sport?), multiple regression analysis was conducted using the simultaneous entry method. In this method, all predictors are forced into the model simultaneously, which is useful for exploratory research and determining the relative influence of variable studied (Field, 2009). Previous studies examining sport fans' website usage reported sport involvement having significant effects on beliefs about the technology (Hur et al. 2011b; Hur et al. 2012), and fanship motivations having significant effects on the technology use (Seo & Green 2008). By connecting the findings from these studies, it would be theoretically reasonable to examine the effects of fan identification. Multiple regression is commonly used when trying to predict a dependent variable (i.e., outcome) from a set of predictors (Stevens, 2009). For the research question eight, the dependent variable was the frequency of smartphone usage to follow sport and predictors were the motivations, constraints, and technological perceptions.

Prior to analyzing the data, several assumptions such as independence, normality,

homoscedasticity, outliers, and multicollinearity were checked. The assumption of independence was satisfied as the researcher requested only one response per Amazon.com account. The residual plots were first examined for the regression analysis in regards to normality and homoscedasticity. A normal plot that visually forms close to the straight diagonal indicates a normal distribution of the residuals. Also, partial regression plots showing a random scatter of residuals around zero to indicate no violation of the homoscedacity assumption. In addition, outliers were checked using Cook's D and Leverage values. Typically if the Cook's D value is smaller than 1.0 and the Leverage value is close to 0, it is considered acceptable. Cook's D values greater than 1.0 are considered outliers and were removed from the analysis. Lastly, homoscedacity was checked using Variance Inflation Factor (VIF) and all predictors should be smaller than the cut-off value of 10 (Stevens, 2009).

Summary of Method

In summary, the current study aims to examine sport fans' motivations, constraints, and technological perceptions related to their smartphone usage. The instrument for this study was adapted from valid and reliable instruments examining technology use in sport and technology acceptance behaviors (Davis, 1989; Ha et al., 2014; Hur et al., 2007; Jung et al., 2009; Kang et al., in press; Seo & Green, 2008), technology constraints and sport consumption constraints using technologies (Hur et al., 2007; Lapointe & Rivard, 2005; Suh, et al., 2010; Witkemper et al., 2012), fan identification (Wann, 2002), and actual usage (Ha et al., 2014; Hur et al., 2007, 2011a, 2012; Kang et al., in press). The survey was hosted on the Qualtrics website and disseminated using Amazon MTurk. The survey will include five main sections: (a)

motivations, (b) constraints, (c) technological perceptions, (d) fan identification, (e) smartphone usage, and (f) demographic information (Appendix A). The collected data were analyzed using EFA, ANOVA, MANOVA, and multiple regression analysis to address the research questions of the current study. In detail, descriptive analysis and ANOVAs were used to address RQ1, RQ2, RQ3, and RQ4; a series of MANOVAs to examine RQ5, RQ6, and RQ7 followed by multiple regression to assess RQ8. The data collection and analysis procedures precisely followed the steps mentioned in this chapter.

CHAPTER IV

RESULTS

The purpose of this study was to explore sport consumers' motivations, constraints, and perceptions toward smartphone usage to understand the relationship between sport consumption and technology consumption behavior. Specifically, the study aimed to (a) examine primary communication channels where smartphones are used; (b) determine factors that influence users to consume sport using smartphones; (c) determine factors that prevent users from consuming sport using smartphones; (d) determine technological perceptions that encourage users to consume sport using smartphones; (e) examine the differences in sport consumers' motivations and constraints to follow sport based on fan identification, sex, age, and fan identification; and (f) examine the factors that predict sport fans' smartphone usage.

Data were collected from the Amazon MTurk workers using the Qualtrics website. Participants responded to an online survey assessing sport consumers' (a) motivations, (b) constraints, (c) technological perceptions, (d) fan identification, (e) smartphone usage, and (f) demographic information. Following the data collection, the researcher addressed seven research questions using Exploratory Factor Analysis (EFA), Multivariate Analysis of Variance (MANOVA), multiple regression, and descriptive statistics analysis to understand sport consumers' smartphone usage behavior.

Scale Validation

Prior to data collection, the researcher conducted a series of pretests as suggested by Dillman (2007) to ensure reliability, validity, and readability of the instrument. First, the instrument was sent to a panel of experts specializing in technology use in sport and/or survey instrument development. The panel of experts was provided with a brief description of the study and operational definitions of the constructs included in the instrument and asked to assess the instrument's content validity. Based on the feedback from the panel of experts, minor changes were made to the items. Second, a field test was conducted with 10 graduate students not possessing an Amazon.com account to detect additional errors from the participants outside of the study's population. The participants were asked to provide insights into the readability and interpretation of the items by identifying any issues with wording, formatting, and question orders they experienced as they responded to the survey items. The researcher made minor changes to the survey based on their feedback.

Once the modifications were made to the instrument, a pilot study was conducted using the Qualtrics website with 65 undergraduate students who own an Amazon account. The students with an Amazon account closely reflected the study sample based on their demographic information. The survey link was emailed to the instructors of a sport administration program asking for their students' voluntary participation to assess scale reliability. This field test was conducted 10 days prior to the actual data collection. The reliability of the scale was measured using Cronbach's alphas and using the value of .70 as a threshold (DeVellis, 2012). The scale reliability was analyzed for six salient motivations, four technological perceptions, and six constraints using Cronbach's alpha

coefficients. For the six motivations, alphas ranged from .50 to .88 including social ($\alpha = .88$), fanship ($\alpha = .87$), information ($\alpha = .85$), entertainment ($\alpha = .83$), pass time ($\alpha = .75$), and economic ($\alpha = .50$). Since the economic motive's alpha coefficient ($\alpha = .50$) was lower than the set threshold suggested by DeVellis (2012), one item "I like to follow sports using my smartphone because I like to get my money's worth for the data usage fee" was marked as a candidate for removal to improve the coefficient to .74. The Cronbach's alpha coefficients for the constraints ranged from .59 to .88 including security ($\alpha = .88$), technology error ($\alpha = .80$), time ($\alpha = .79$), skill ($\alpha = .79$), expense ($\alpha = .76$), and lack of interest ($\alpha = .59$). Since the lack of interest constraint's alpha coefficient was lower than the set threshold of .70, one item "I would rather spend time with friends or family than use my smartphone to follow sports" was marked as a candidate for removal to improve the coefficient to .82. For technological perceptions, the Cronbach's alpha coefficients ranged from .77 to .90 including curiosity ($\alpha = .90$), usefulness ($\alpha = .80$), media multitasking ($\alpha = .79$), and ease of use ($\alpha = .77$). Finally, the Cronbach's alpha coefficient for fan identification items was .80. Due to the sufficient level of Cronbach's alpha coefficients, no items were removed from the items measuring technological perceptions or fan identification. The complete survey is located in Appendix A.

Descriptive Statistics

Data were collected from 372 Amazon MTurk workers by meeting the inclusion criteria of (a) Are you fan of sports? and (b) Do you own a smartphone? (i.e., iPhone, Android, Windows phone). The respondents' IP addresses were checked to avoid duplicate survey responses. The sample size closely reflected the minimum required

sample size of 383 suggested by Dillman (2007) for a population of 100,000 (currently active MTurk workers) to achieve a 95% confidence level with an error margin of 5% sampling error. The sample size for this study was also adequate for various statistical and inferential requirements as suggested by Stevens (2009), who recommended a minimum of 120 participants based on eight predictors presented in this study (i.e., 15 participants per predictor variable).

The sample was composed of 65.05% ($n = 242$) male and 34.95% ($n = 130$) female. The participants' ages ranged from 18 to 70 years old with an average age of 31 years old ($M = 30.92$, $SD = 9.65$). In regards to their ethnicity, the majority of the participants were White/Caucasian (68.55%, $n = 255$), followed by Asian or Pacific Islander (12.90%, $n = 48$), Black/African American (9.41%, $n = 35$), Hispanic/Latino (7.53%, $n = 28$), American Indian or Alaskan Native (0.81%, $n = 3$), and other (0.54%, $n = 2$). Additionally, 33.33% ($n = 124$) of the respondents indicated an annual household income between \$25,000 and \$49,999, and 29.30% ($n = 109$) of the respondents were between \$50,000 and \$99,999. Other respondents (26.61%, $n = 99$) earned less than \$24,999, while 10.75% ($n = 40$) of the respondents indicated that they earned \$100,000 or more. In regards to participants' highest level of education completed, majority of the participants completed a Bachelor's degree (37.9%, $n = 141$), followed by a high school degree (31.72%, $n = 12$), an associate degree (20.16%, $n = 77$), a master's degree (7.8%, $n = 3$), higher than master's degree (1.88%, $n = 7$), and less than high school degree (0.53%, $n = 2$). This demographic information is presented in Table 1.

Table 1
Demographics of the respondents

Variable	Percent	N
Gender		
Male	65	242
Female	35	130
Ethnicity		
White/Caucasian	68.55	255
Black/African American	9.41	35
Hispanic/Latino	7.53	28
American Indian/Alaskan Native	0.81	3
Asian/Pacific Islander	12.9	48
Other	0.54	2
Annual Household Income		
Less than \$24,999	33.33	124
\$25,000-\$49,999	29.3	109
\$50,000-\$99,999	26.61	99
\$100,000+	10.75	40
Highest Level of Education Completed		
Less than high school degree	0.53	2
High school degree	31.72	118
Associate (2 year) degree	20.16	75
Bachelor's (4 year) degree	37.9	141
Master's degree	7.80	29
Higher than a Master's degree	1.88	7

Representativeness of the Sample

In order to examine the characteristics of the sample in regards to the representation of the population, the researcher compared demographic data from Bates and Lanza's (2013) study examining the MTurk users and Kang et al.'s (in press) study examining smartphone applications. Chi-square analysis and ANOVA were used to examine the similarities and differences in (a) sex, (b) race, and (c) age. The results from

the chi-square analysis and ANOVA indicated no significant differences between the MTurk users in Bates and Lanza's (2013) study population in North America and the current study in terms of respondents' sex ($\chi^2 = .64$, $df = 1$, $p > .05$), race ($\chi^2 = 10.54$, $df = 15$, $p > .05$), and age ($F = .95$, $df = 30$, $p > .05$). Furthermore, there was no significant difference between the demographics of Kang et al.'s (in press) study and the current study's in regards to their sex ($\chi^2 = 3.63$, $df = 2$, $p > .05$), race ($\chi^2 = 14.41$, $df = 30$, $p > .05$), and age ($F = 1.34$, $df = 44$, $p > .05$). Results indicated the sample is representative of the population based on the comparison of the demographic information in terms of respondents' sex, race, and age.

Sampling Bias

In addition, the researcher compared responses of early and late respondents to address the concerns of non-response bias. Considering late respondents often have similar characteristics as the non-respondents (Ary et al., 2009), the responses from the current study were divided into four groups depending on the order they completed the survey. The first group ($n = 93$) was considered as the early respondents and the last group ($n = 93$) was considered as the late respondents. One-way ANOVAs were used to examine the differences between the two groups and the results indicated that there were no significant differences between the groups in terms of their motivations ($F = .76$, $df = 46$, $p > .05$), technological perceptions ($F = 1.0$, $df = 38$, $p > .05$), and constraints ($F = 1.02$, $df = 46$, $p > .05$). The non-significant results indicated that the study sample was unbiased and sufficiently representative of the population (Ary et al., 2009).

Exploratory Factor Analysis

An EFA using SPSS 22.0 was conducted to determine the underlying factor structure for sport consumers' motivations, constraints, and technological perceptions associated with their smartphone usage. Prior to conducting an EFA, several assumptions were checked, including: (a) sample size, (b) normality, (c) linearity, and (d) outliers among the variables. First, the sample size of 372 exceeded the recommended minimum sample of 240 (Stevens, 2009). Secondly, the normality probability plot was examined. The variables appeared to be normally distributed, as the plots formed close to straight lines running at 45-degree angles without substantial skewness and kurtosis. Thirdly, scatterplots were also checked, and the relationship between the variables appeared to be linear with plots forming a line, indicating the assumption of linearity was met. Finally, outliers exhibiting low squared multiple correlations with other variables were removed from the analysis, and the details are discussed below.

Upon meeting all of the assumptions, four criteria were used to determine the number of factors to retain, and these included: (1) Kaiser's eigenvalue greater than 1.0, (2) Cattell's scree test, (3) the number of item loading on each factor, and (4) the amount of total variance explained by the factors (Stevens, 2009). The following section explores the complex nature of the three constructs by conducting three separate EFAs for motivations, constraints, and technological perceptions.

Factor Structure of Smartphone Consumption Motivations

In order to determine the underlying factor structure for sport consumers' motivations related to smartphone usage, Principal Component Analysis (PCA) with Varimax rotation was conducted for 19 items, including the ones marked as candidates

for removal, from the scale reliability analysis in the pilot study. Initially, the Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy was .93, indicating sufficient correlation among the variables. In addition, Barlett's Test of Sphericity was statistically significant ($\chi^2 = 3899.96$, $df = 171$, $p < .000$) indicating the data were appropriate for a factor analysis. The extracted communalities from PCA ranged from .38 to .88. The communalities reflect the proportion of variance explained by the retained factors, and variables with low communalities, typically less than .40, are candidates for removal (Stevens, 2009). One of the items (economic), "I like to follow sports using my smartphone because I like to get my money's worth for the data usage fee," had a low communality of .38 and was marked as a candidate for removal from the analysis. This particular item was also marked for removal based on the low value of Cronbach's alpha from the pilot study. Using the four criteria mentioned above, three factors were retained, explaining 60.57% of the total variance.

The first factor in the rotated solution explained about 29.72% of the variance including three items each from the entertainment, fanship, information motivations, two items from the economic motivations, and one item from the pass time motivations. The second factor in the rotated solution explained approximately 19.07% of the variance, including four items from the social motivations and one item from the economic motivations. The third factor in the rotated solution explained about 11.78% of the variance, including two items from the pass time motivations. However, one of the items (pass time), "I use my smartphone to follow sports during my free time," that loaded onto factor one was a theoretical misfit, since items loaded onto factor one included items from entertainment, fanship, information, and economic motivations. The other pass time

items in this analysis were loaded onto factor three. Considering these reasons, the economic item that was marked for removal due to low communality and pass time item were both deleted from the analysis.

Once the two items were deleted, 17 items were examined again using the PCA Varimax rotation. The KMO with .913 and Bartlett's Test of Sphericity ($\chi^2 = 3413.42$, $df = 136$, $p < .000$) indicate sufficient correlation among variables, which is appropriate for a factor analysis. The extracted communalities ranged between .40 (economic) and .88 (occupy time). A total of three factors were retained using the four criteria mentioned above. Using the Kaiser-Guterman (2004) retention criterion of eigenvalues greater than 1.0, three factors were retained, and their eigenvalues were as follows: 7.46 for factor one, 1.90 for factor two, and 1.20 for factor three. Additionally, the scree plot showed the turning point at component three, indicating a transition point between components with high and low eigenvalues (i.e., Factors 1, 2, and 3).

The total amount of variance accounted for by the first three principal components solution was 62.08%. The first factor in the unrotated solution accounted for the most variance (43.85%), followed by the second (11.18%) and third (7.04%) factors. After rotation, there was no change in the total amount of variance with the three factors, but the amount of variance explained by each factor changed. Factor one accounted for 30.13% of the variance, followed by factor two (19.74%) and factor three (12.20%). Furthermore, using the factor loading of .40 as a cutoff point (Stevens, 2009), 11 items loaded onto the first factor, four items loaded onto the second factor, and two items loaded onto the third factor.

Specifically, the first factor included 11 items, including three items each from the entertainment, fanship, information motivations and two items from the economic motivations. Items in the first factor included “Using my smartphone to follow sport is exciting to me” from the entertainment motive, “One of the main reasons I use my smartphone to follow sports is that I am a fan of sports in general” from the fanship motive, “Sport-related information obtained from my smartphone is useful” from the information motive, and “I like to follow sports using my smartphone because the device and services are very affordable” from the economic motivation. These items consider sport consumers’ self-driven motivations; therefore, factor one was named intrinsic motivations. Intrinsic motivations are commonly referred to as behaviors that are driven by internal rewards (Coon & Mitterer, 2010).

The second factor included four items from social motivations. The included items were, “I like to share my opinion about sports using my smartphone,” “I enjoy debating sport-related issues using my smartphone,” “I like to chat with people about sports using my smartphone,” and “My smartphone gives me a chance to discuss sport with other people.” The four items relate to sport consumers’ desire to communicate and socialize with other people to share their interest. Therefore, factor two was named social motivation. Finally, the third factor consisted of two items including, “I use my smartphone to follow sports because it passes the time away, particularly when I’m bored,” and “I use my smartphone to follow sports because it gives me something to do to occupy my time.” The two items focused on sport consumers’ motive to occupy their time by using smartphones to follow sports; therefore, factor three was named diversion motivations. All factor loadings are presented in Table 2.

Table 2

Factor Structure Matrix for Smartphone Consumption Motivations

Motivations	Factor 1 <u>Intrinsic</u>	Factor 2 <u>Social</u>	Factor 3 <u>Diversion</u>	h^2
Enjoyable	0.79	0.19	0.27	0.58
Fanship	0.74	0.20	0.11	0.60
Useful information	0.72	0.16	0.14	0.56
A big fan	0.69	0.27	0.15	0.48
Free service	0.67	-0.12	0.26	0.53
Exciting	0.65	0.36	0.18	0.44
Obtain information	0.64	0.11	-0.04	0.56
Learn information	0.64	0.30	0.26	0.43
Affordable	0.60	0.15	0.11	0.40
Fan in general	0.55	0.30	0.30	0.57
Amusing	0.54	0.28	0.25	0.73
Share opinion	0.19	0.85	0.09	0.76
Debating sport issues	0.13	0.85	0.15	0.64
Chat about sports	0.19	0.84	0.13	0.77
Discuss sports	0.31	0.73	0.12	0.76
Passes time	0.24	0.17	0.89	0.87
Occupy time	0.27	0.20	0.88	0.88
Eigenvalues	7.46	1.90	1.20	
Percentage of Variance	43.86	44.18	7.04	
Internal Consistency (α)	0.90	0.88	0.89	

Note: h^2 = communalities. Factor structure coefficients of .40 or higher are in bold.

Factor Structure of Smartphone Consumption Constraints

Sport consumers' constraints related to smartphone usage were also examined using PCA with Varimax rotation. The analysis was conducted for 18 items, including the lack of interest item marked as a candidate for removal, from the scale reliability analysis in the pilot study. Initially, the KMO measures of sampling adequacy was .89, indicating sufficient correlation among the variables. In addition, Barlett's Test of Sphericity was statistically significant ($\chi^2 = 2898.67$, $df = 153$, $p < .000$) indicating that the data were appropriate for a factor analysis. The extracted communalities from the

PCA ranged from .10 (time constraint) to .81 (not feeling secure). The time constraint item, “I would rather spend time with friends or family than use my smartphone to follow sports,” had a low communality and was marked as a candidate for removal from the analysis. Using the four criteria mentioned above, four factors were retained, explaining 61.99% of the total variance.

Once the time constraint item was deleted, 17 items were examined again using PCA Varimax rotation. The KMO with .89 and Bartlett’s Test of Sphericity ($\chi^2 = 2845.14$, $df = 136$, $p < .000$) indicating sufficient correlation among variables were appropriate for a factor analysis. The extracted communalities ranged between .40 (lack of skill) and .81 (not feeling secure). A total of three factors were retained using the four criteria mentioned above. Using the Kaiser-Guttman (1960) retention criterion of eigenvalues greater than 1.0, three factors were retained, and their eigenvalues were as follows: 6.32 for factor one, 2.15 for factor two, and 1.44 for factor three. Additionally, using the graphical method of Cattell’s (1966) scree test, the three-factor structure was supported, as it showed the turning point at component three on the scree plot.

The total amount of variance accounted for by the first three principal components solution was 58.32%. The first factor in an unrotated solution accounted for the most variance (37.17%), followed by the second (12.66%) and third (8.50%) factors. After rotation, there was no change in the total amount of variance with the three factors, but the amount of variance explained by each factor changed. Factor one accounted for 30.02% of the variance, followed by factor two (14.49%) and factor three (13.81%). Using the factor loadings greater than .40 suggested by Stevens (2009), 11 items loaded

onto the first factor, three items loaded onto the second factor, and three items loaded on the third factor.

Specifically, the first factor included 11 items from skill, time, lack of interest, and expense constraints. For instance, “I find it difficult to use my smartphone to follow sports” from skill constraints, “I do not have enough time to use my smartphone to follow sports” from time constraints, “Using my smartphone to follow sports is not attractive to me” from lack of interest constraints, and “Using my smartphone to follow sports requires more money than I can spend” from expense constraints were included in factor one. Considering the characteristics of the items that relate to one’s preferences, factor one was named personal constraints.

The second factor included three items from security constraints including, “When following sports, I don’t feel secure sending my personal information using my smartphone,” “When following sports, I am concerned that my personal/financial information on my smartphone might be shared without my consent,” and “When following sports, I am concerned about the security of personal information stored on my smartphone.” Thus, the second factor was named security constraints. Finally, the third factor included items from technology error constraints, including, “I feel irritated when my smartphone does not work well to follow sports,” “Experiencing a technical error (e.g. malfunction of touch screen, loss of signal) while following sports is a frustrating experience,” and “I feel irritated when my Wi-Fi/3G/4G connections are too unstable to follow sports.” Considering the technical difficulties experienced by smartphone users, the third factor was named technology constraints. All factor loadings are presented in Table 3 and details of the items are presented in Table 5.

Table 3

Factor Structure Matrix for Smartphone Consumption Constraints

Constraints	Factor 1 Personal	Factor 2 Security	Factor 3 Technology	h^2
Difficulty	0.74	0.14	-0.06	0.56
Not enough time	0.72	0.11	-0.13	0.54
Busy	0.72	0.16	-0.12	0.55
Lack of skill	0.69	0.13	-0.01	0.40
Requires money	0.69	0.27	-0.05	0.55
Not attractive	0.66	0.11	-0.39	0.51
Not interested	0.65	0.12	-0.43	0.55
Price	0.65	0.29	0.06	0.51
Expense	0.63	0.36	-0.08	0.54
Not enjoying	0.63	0.10	-0.39	0.59
Technical skill	0.61	0.09	0.15	0.50
Personal security	0.19	0.88	0.01	0.60
Information security	0.25	0.85	0.01	0.79
Not feeling secure	0.23	0.74	-0.07	0.81
Connection error	-0.05	-0.09	0.81	0.63
Device error	-0.04	0.01	0.79	0.52
Technical error	-0.08	0.05	0.71	0.67
Eigenvalues	6.32	2.15	1.44	
Percentage Variance	37.17	12.66	8.50	
Internal Consistency	0.90	0.83	0.72	

Note: h^2 = communalities. Factor structure coefficients of .40 or higher are in bold.

Factor Structure of Perceptions toward Smartphones

In order to examine the underlying factor structure of sport consumers' perceptions toward smartphones, PCA with Varimax rotation was conducted. The analysis was conducted for 12 items including the lack of interest item marked as a candidate for removal from the scale reliability analysis in the pilot study. Initially, the KMO measures of sampling adequacy was .93, indicating sufficient correlation among the variables. In addition, Barlett's Test of Sphericity was statistically significant ($\chi^2 = 2477.08$, $df = 78$, $p < .000$) indicating sufficient correlation among the variables, which is

appropriate for a factor analysis. The extracted communalities from the PCA were fairly high, ranging from .48 (media multitasking 1) to .70 (ease of use 1). A total of two factors were retained using the four criteria mentioned above. Using the Kaiser-Guttman (1960) retention criterion of eigenvalues greater than 1.0, two factors were retained, and their eigenvalues were as follows: 6.47 for factor one and 1.35 for factor two. Additionally, a graphical method of Cattell's (1966) scree test supported this decision with two factors lying above the elbow on the scree plot.

The total amount of variance accounted for by the first two principal components solution was 60.25%. The first factor in the unrotated solution accounted for the most variance (49.82%), followed by the second (10.43%) factor. After rotation, factor one accounted for 33.36% of the variance and factor two accounted for about 26.89% of the variance. Furthermore, using the factor loadings greater than .40 as a cutoff point (Stevens, 2009), eight items loaded onto the first factor and five items loaded onto the second factor. The items in factor one originally included four items from perceived curiosity, three items from perceived media multitasking, and one item from perceived usefulness. However, an item from perceived usefulness (quality), "I use my smartphone to increase the quality of my sports fan experiences," was cross-loaded onto the first (.65) and second factors (.41). In this case, items are usually loaded onto the factor with higher coefficients. However, the reliable and valid framework of TAM's (Davis, 1989) short form proposed three items for the perceived usefulness construct, and a decision was made to keep all of the items from perceived usefulness together in the second factor. Statistically, loading the one item onto the second factor had a minimal effect, as the Cronbach's alphas for eight items ($\alpha = .88$) and seven items ($\alpha = .86$) indicated

acceptable internal consistency (Nunnally & Bernstein, 1994). Therefore, a total of seven items were loaded onto the first factor and six items were loaded onto the second factor.

Specifically, the first factor included seven items from perceived curiosity and perceived media multitasking. For example, items such as “When I find a cool new way to follow sports on my smartphone, I want to tell others about it,” and “I enjoy exploring new functions on my smartphone to follow sports” from perceived curiosity as well as “I like to use my smartphone and other media/devices simultaneously to follow sports” and “I like to chat with my friends while at the same time following sports on my smartphone” from perceived media multitasking were included in factor one. Reflecting upon the nature of the items included, factor one was named hedonic perceptions. According to Ahtola (1985), hedonic perceptions in consumer behavior studies are often referred to as pleasure experienced or expected by performing a behavior (i.e., using a smartphone). The second factor consisted of a total of six items, including three items from perceived usefulness and three items from perceived ease of use. For instance, “I use my smartphone to increase the quality of my sports fan experiences” from perceived usefulness and “Using my smartphone to follow sports is easy for me” from perceived ease of use were included. By combining these two perceptions, the second factor was named utilitarian perceptions. The utilitarian aspect in consumer behavior relates to “usefulness, value, and wiseness of the behavior as perceived by the consumer” (Ahtola, 1985, p. 8). All factor loadings are presented in Table 4 and details of the items are presented in Table 5.

Table 4
Factor Structure Matrix for Perceptions Toward Smartphones

Technological Perceptions	Factor 1 Hedonic	Factor 2 Utilitarian	h^2
Cool new way	0.74	0.10	0.54
Discover new things	0.73	0.29	0.66
Exploring new function	0.72	0.37	0.62
Multitasking while chatting	0.71	0.16	0.56
Recommendation	0.70	0.21	0.48
Quality	0.65	0.41	0.70
Multitasking with other media	0.64	0.26	0.51
Multitasking with other activities	0.64	0.32	0.52
Easy to work with	0.15	0.82	0.69
Clear function	0.19	0.82	0.70
Easy to use	0.29	0.79	0.60
Useful	0.39	0.70	0.64
Assist my fan lifestyle	0.44	0.64	0.60
Eigenvalues	6.48	1.36	
Percentage Variance	49.82	10.43	
Internal Consistency	0.88	0.86	

Note: h^2 = communalities. Factor structure coefficients of .40 or higher are in bold.

Reliability analysis. Once all of the underlying constructs were revealed, the reliability of the scale was measured again using Cronbach's alpha coefficients. The reliability coefficient for motivations, perceptions, and constraints were all above the acceptable alpha range of .70. The intrinsic motivations had a value of .90, social motivations had a value of .88, and diversion motivations had a value of .89. For technological perceptions, hedonic perceptions had a reliability coefficient value of .86 and utilitarian perceptions had a value of .87. Furthermore, Cronbach's alphas for personal constraints with a value of .90, security constraints with a value of .83, and technology constraints with a value of .72 also displayed an acceptable alpha range (DeVellis, 2012). The complete list of factors and items are presented in Table 5.

Table 5

Factors and Items for Motivations, Constraints, and Technological Perceptions

Factors	Items	<i>M</i>	<i>SD</i>	α
Intrinsic Motivations		5.45	1.18	0.90
	I learn about things happening in the sport industry using my smartphone.			
	Sport-related information obtained from my smartphone is useful.			
	I can get information about various sports such as team performance, player profiles, and game schedules through my smartphone.			
	Using my smartphone to follow sports is exciting to me.			
	Using my smartphone to follow sports is amusing to me.			
	Using my smartphone to follow sports is enjoyable to me.			
	One of the main reasons I use my smartphone to follow sports is that I consider myself a fan.			
	One of the main reasons I use my smartphone to follow sports is that I am a fan of sports in general.			
	One of the main reasons I use my smartphone to follow sports is that I consider myself to be a big fan of my favorite team, sport, or activity.			
	I like to follow sports using my smartphone because the services (e.g. apps, mobile-browser) are usually free.			
	I like to follow sports using my smartphone because the device and services are very affordable.			
Social Motivations		4.61	1.21	0.88
	I like to share my opinion about sports using my smartphone.			
	I enjoy debating sport-related issues using my smartphone.			
	I like to chat with people about sports using my smartphone.			
	My smartphone gives me a chance to discuss sport with other people.			
Diversion Motivations		5.10	1.02	0.89
	I use my smartphone to follow sports because it passes the time away, particularly when I'm bored.			
	I use my smartphone to follow sports because it gives me something to do to occupy my time.			

Hedonic Perceptions	5.04	0.99	0.86
When friends or families recommend smartphone functions (e.g., apps, QR codes, websites) to follow sports, I want to try them.			
I enjoy exploring new functions on my smartphone to follow sports.			
When I discover new things I could do on my phone to follow sports, I want to try them.			
When I find a cool new way to follow sports on my smartphone, I want to tell others about it.			
I like to use my smartphone and other media/devices simultaneously to follow sports.			
I like to use my smartphone to follow sports while doing other activities on my smartphone.			
I like to chat with my friends while at the same time following sports on my smartphone.			
Utilitarian Perceptions	5.62	0.84	0.87
Using my smartphone to follow sports is easy for me.			
I find it easy to get my smartphone to do what I want it to do when following sports.			
Smartphone functions I use to follow sports are clear and understandable to me.			
I use my smartphone to increase the quality of my sports fan experiences.			
I find smartphone useful for following sports.			
I use my smartphone to assist my fan lifestyle (e.g. game score notification).			
Personal Constraints	2.58	1.45	0.90
I do not have enough time to use my smartphone to follow sports.			
I am too busy to follow sports using my smartphone because of my other obligations.			
I am not interested in following sports using my smartphone.			
I do not enjoy using my smartphone to follow sports.			
Using my smartphone to follow sports is not attractive to me.			
I find it difficult to use my smartphone to follow sports.			
I am not good at the technical skills required to use my smartphone to follow sports.			

I do not know where or how to use my smartphone to follow sports.			
Using my smartphone to follow sports requires more money than I can spend.			
The price I pay for the smartphone usage to follow sports (including the device, services, apps) is way too high.			
The expense related to smartphone usage discourages me from following sports using my smartphone.			
Security Constraints	3.60	1.04	0.83
When following sports, I don't feel secure sending my personal information using my smartphone.			
When following sports, I am concerned that my personal/financial information on my smartphone might be shared without my consent.			
When following sports, I am concerned about the security of personal information stored on my smartphone.			
Technology Constraints	5.49	1.09	0.72
I feel irritated when my smartphone does not work well to follow sports.			
Experiencing a technical error (e.g. malfunction of touch screen, loss of signal) while following sports is a frustrating experience.			
I feel irritated when my Wi-Fi/3G/4G connections are too unstable to follow sports.			

Data Analysis

Eight major research questions were developed to address the purpose of this study.

Research Question 1

RQ1: What communication channels (e.g., sport-related apps, social media, mobile web browser, texting) do sport consumers utilize the most in order to follow sport using their smartphones?

The researcher examined the descriptive statistics to determine what

communication channels sport consumers used. The participants were asked to indicate how often they followed sport using the following functions: official sites, sport-related apps, social media, text message, push notification, and emails. The participants were also asked to select all of the categories that applied to their usage. Based on a 7-point Likert scale, the mean scores were 4.92 for official sites ($SD = 1.55$) followed by 4.37 for sport-related apps ($SD = 1.79$), 4.35 for social media ($SD = 1.96$), 3.55 for text messages ($SD = 2.01$), 3.25 for push notification ($SD = 1.95$), and 2.87 for emails ($SD = 1.89$). Results indicated sport consumers in this study utilized official sites (e.g., espn.com, nba.com) most frequently to follow their favorite sports (Table 6).

In addition, among the sports the participants followed using their smartphones NFL was ranked the highest ($n = 290$, 77.96%) followed by NBA ($n = 187$, 50.27%), MLB ($n = 173$, 46.51%), NCAA Football ($n = 129$, 34.68%), NHL ($n = 99$, 26.61%), NCAA Men's Basketball ($n = 90$, 24.2%), Fantasy Sports ($n = 84$, 22.58%), Professional Soccer ($n = 50$, 13.44%), NASCAR ($n = 32$, 8.60%), Others ($n = 25$, 6.72%), Professional Men's Tennis ($n = 24$, 6.45%), NCAA Baseball ($n = 21$, 5.65%), NCAA Women's Basketball ($n = 17$, 4.57%), Professional Women's Tennis ($n = 16$, 4.30%), and WNBA ($n = 12$, 3.23%) in consecutive order. The Others category was represented by sports such as the PGA, boxing, high school football, Formula One, and Olympics events. The participants were able to select all of the categories that applied to their usage, and multiple selections were permitted. For the sports they selected above, participants also indicated that they followed their favorite teams (e.g., Boston Red Sox, Los Angeles Lakers) the most ($n = 327$, 87.90%), leagues (e.g., NCAA, NFL) second ($n = 246$, 66.13%), and players third ($n = 172$, 46.24%).

Moreover, the results from this study also indicated that male participants overall followed more sports (percentage ranging from 6.20% to 81.82%) than female participants, (percentage ranging from 4.62% to 70.77%), and both male and female participants followed mainstream sports the most (e.g., NFL, NBA, MLB). The women's sports including NCAA Women's Basketball, Professional Women's Tennis, and WNBA were followed the least, but within the women's sports category, females followed them more than male participants. For the age group, Millennials (i.e. 33 and younger) followed more sports (percentage ranging from 4.33% to 78.35%) than non-Millennial groups (percentage ranging from .85% to 77.12%) with exceptions of NCAA Basketball, Fantasy Sports, NASCAR, and NCAA Women's Basketball. For the fan ID groups, sport consumers with high ID generally followed more sports (percentage ranging from 3.10% to 58.28%) than the low ID group (percentage ranging from 1.65% to 66.48%) with an exception of Professional Soccer, NASCAR, and NCAA Women's Basketball. All categories are presented in Table 7.

Table 6
Communication Channels

	<i>M</i>	<i>SD</i>	<i>N</i>
Official sites	4.92	1.55	372
Sport-related apps	4.37	1.79	372
Social media	4.35	1.96	372
Text messages	3.55	2.04	372
Sport fan community	3.42	1.88	372
Push notifications	3.25	1.95	372
Emails	2.87	1.89	372

Table 7
Smartphone Usage Categories

<i>N</i>			Sex		Fan ID		Age	
Classification	Total		M	F	High	Low	Millen.	Non-Millen.
<i>N</i>	372		242	130	290	182	254	118
Sports		%	%	%	%	%	%	%
NFL	290	77.96	81.82	70.77	58.28	66.48	78.35	77.12
NBA	187	50.27	55.79	40.00	41.03	37.36	53.94	42.37
MLB	173	46.51	49.59	40.77	37.59	35.16	44.88	50.00
NCAA Football	129	34.68	35.12	33.85	29.66	23.63	29.53	45.76
NHL	99	26.61	25.62	28.46	21.03	20.88	29.92	19.49
NCAA Men's Basketball	90	24.19	27.69	17.69	21.72	14.84	5.12	6.78
Fantasy Sports	84	22.58	26.45	15.38	20.69	13.19	20.87	26.27
Pro. Soccer	50	13.44	14.05	12.31	8.62	13.74	14.17	11.86
NASCAR	32	8.60	7.85	10.00	6.21	7.69	6.30	13.56
Pro. Men’s Tennis	24	6.45	7.02	5.38	5.86	3.85	7.87	3.39
NCAA Baseball	21	5.65	6.20	4.62	4.48	4.40	22.83	27.12
NCAA Women's Basketball	17	4.57	2.89	7.69	3.10	4.40	4.33	5.08
Pro. Women’s Tennis	16	4.30	2.89	6.92	4.14	2.20	4.33	4.24
WNBA	12	3.23	1.65	6.15	3.10	1.65	4.33	0.85
Categories								
Teams	327	87.90	86.36	90.77	61.38	81.87	86.22	91.53
Leagues	246	66.13	74.79	50.00	48.62	57.69	65.75	66.95
Player	172	46.24	47.11	44.62	35.86	37.36	46.85	44.92

Research Question 2

RQ2: What motivational factors drive sport consumers to use their smartphones to consume sport?

The researcher computed mean scores to determine the factors that drive sport consumers to use their smartphones to consume sport. Based on a 7-point Likert scale, the intrinsic motivations had the highest mean score ($M = 5.45$, $SD = 1.18$) followed by

the diversion motivations ($M = 5.10$, $SD = 1.02$) and social motivations ($M = 4.61$, $SD = 1.21$). The researcher conducted a one-way ANOVA to examine the statistical difference between the mean scores. Prior to the analysis, the three assumptions of independence, normality, and homogeneity of variance were checked. First, independent assumption was met by checking the Internet Protocol (IP) addresses, which ensured respondents only took the survey once, independently. Second, the researcher examined the results of Q-Q plots and the plots formed closely with the straight line running at a 45-degree angle, indicating the data were normal. Finally, the Levene's test result was statistically significant ($p < .01$), failing to meet the homogeneity of variance assumption. However, the nature of the F statistic in ANOVA is robust against heterogeneous variances, especially when group sizes are fairly equal. Thus, the researcher proceeded with the analysis.

The result indicated that there were a significant difference in mean scores among the three groups (i.e., intrinsic, social, diversion motivations) in terms of their mean scores [$F(2, 1113) = 48.84$, $p < .001$]. Following the main analysis, Tukey HSD post hoc analysis was conducted to identify the between-group differences. The results revealed significant differences between the mean scores of intrinsic and social motivations ($p < .001$), intrinsic and diversion motivations ($p < .001$), and diversion and social motivations ($p < .001$).

Research Question 3

RQ3: What constraining factors hinder sport consumers from using their smartphones to consume sport?

The mean scores for three constructs of constraints were computed to examine

the factors that hinder sport consumers from using their smartphone to consume sport. The participants from this study indicated that technology constraints ($M = 5.49$, $SD = 1.09$) hindered the sport consumers the most, followed by security constraints ($M = 3.60$, $SD = 1.04$) and personal constraints ($M = 2.58$, $SD = 1.45$). The researcher conducted a one-way ANOVA to examine the statistical difference between the mean scores. Prior to the analysis, the three assumptions of independence, normality, and homogeneity of variance were checked in a similar manner as above (RQ2), and all assumptions were met except the homogeneity of variance assumption ($p < .001$). However, considering the nature of the F statistic in ANOVA, which is robust against heterogeneous variances, the researcher proceeded with the analysis.

The result indicated that there was a significant difference in mean scores among the three groups (i.e., technology, security, personal constraints) in terms of their mean scores [$F(2, 1113) = 545.28$, $p < .001$]. Following the main analysis, Tukey HSD post hoc analysis was conducted to identify the between-group differences. The results revealed significant differences between the means scores of personal and security constraints ($p < .001$), personal and technology constraints ($p < .001$), and technology and security constraints ($p < .001$).

Research Question 4

RQ4: What technological perceptions encourage users to consume sport using their smartphones?

The mean scores for the two perceptions toward technology were computed to examine the technical perceptions that encourage sport consumers to use their smartphones. The mean score for utilitarian perceptions ($M = 5.62$, $SD = 0.84$) was

higher than the hedonic perceptions ($M = 5.04$, $SD = 0.99$) indicating utilitarian perceptions encouraged the sport consumers in this study the most when following their favorite sports using smartphones. The researcher conducted a one-way ANOVA to examine the statistical difference between the mean scores. Prior to the analysis, the three assumptions of independence, normality, and homogeneity of variance were checked in a similar manner as above (RQ2), and all assumptions were met except the homogeneity of variance assumption ($p < .01$). However, considering the nature of the F statistic in ANOVA, which is robust against heterogeneous variances, the researcher proceeded with the analysis. The result indicated that there was a significant difference in mean scores between the two groups (i.e., utilitarian, hedonic perceptions) in terms of their mean scores [$F(1, 742) = 75.45$, $p < .001$].

Research Question 5

RQ5: Are sex, age, and fan identification significantly related to a linear combination of three factors of motivations?

To address the fifth research question, a 2x2x2 between-subject MANOVA was conducted with intrinsic, social, and diversion motivations serving as the dependent variables and sex, age, and fan identification serving as the independent variables. Prior to conducting the analysis, the researcher categorized respondents into two age groups Millennial (i.e., 33 and younger) and non-Millennial (i.e., 34 and older). Respondents were also categorized based on fan identification into a high group and a low group using a median split. In terms of grouping, there were 239 males and 129 females in the sex category, 251 Millennial and 117 non-Millennial in age category, and 187 high identified fans and 181 low identified fans in the fan identification category.

The researcher also examined the three assumptions of independence, normality, and equality of covariances. First, each of the respondents' Internet Protocol (IP) addresses was checked to ensure respondents only took the survey once, independently; and the independent assumption was met. Second, the researcher examined the results of Q-Q plots and the plots formed closely with the straight line running at a 45-degree angle, indicating the data were normal. Finally, Box's Test of Equality of Covariance Matrices was examined (Box's $M = 115.66$, $F = 2.66$, $p < .01$) and the result was statistically significant, failing to meet the homogeneity of variance-covariance assumption. However, the nature of the F statistic in MANOVA is robust against heterogeneous variances, especially when group sizes are fairly equal--that is when the largest group size does not exceed 1.5 times the size of the smallest group (Stevens, 2009). Considering the robustness of MANOVA in the presence of this violation of the assumption, the researcher proceeded with the analysis. Finally, Barlett's Test of Sphericity was statistically significant ($\chi^2 = 269.82$, $df = 5$, $p < .01$), indicating sufficient correlation between the dependent variables to proceed with the analysis.

The results indicated no statistically significant differences for the following 2-way or 3-way interactions: sex and fan identification (Wilks' $\Lambda = 1.00$, $F(3, 358) = .45$, $p > .05$, partial $\eta^2 = .00$); sex and age group (Wilks' $\Lambda = .99$, $F(3, 358) = .79$, $p > .05$, partial $\eta^2 = .01$); fan identification and age group (Wilks' $\Lambda = .99$, $F(3, 358) = 1.40$, $p > .05$, partial $\eta^2 = .01$); and sex, fan identification, age group (Wilks' $\Lambda = .99$, $F(3, 358) = .92$, $p > .05$, partial $\eta^2 = .01$). The main effect of sex on the linear combination of the three motivations was not statistically significant (Wilks' $\Lambda = .98$, $F(3, 358) = 2.20$, $p > .05$, partial $\eta^2 = .02$). Similarly, the main effect of age on the linear combination of the

three motivations was not statistically significant (Wilks' $\Lambda = .98$, $F(3, 358) = 2.26$, $p > .05$, partial $\eta^2 = .02$). On the contrary, the main effect of fan identification on the linear combination of the three motivations was statistically significant (Wilks' $\Lambda = .78$, $F(3, 358) = 33.92$, $p < .01$, partial $\eta^2 = .22$). The partial eta-squared value suggested that approximately 22% of the total variance in the smartphone motivations was accounted for by fan identification.

Based on the statistically significant results of the multivariate analysis (i.e., fan identification), a univariate analysis was conducted to assess each dependent variable. Prior to conducting a univariate analysis, the Levene's Test of Equality of Error was examined to check for the assumption of homogeneity of variances. The result revealed significant results for all of the dependent variables, including intrinsic motivations ($p < .01$), diversion motivations ($p < .01$), and social motivations ($p < .05$). The significant results violated the assumption of homogeneity of variance by indicating significant differences in the dependent variables across levels of smartphone motivations. As noted above, the F statistic is relatively robust in the presence of homogeneity of variance violation (Stevens, 2009). However, in the presence of homogeneity of variance violation, Keppel, Saufley, and Tokunaga (1992) recommend the use of more stringent alpha of $p < .025$ to evaluate F ratios. Therefore, the researcher used alpha level of .025 for the univariate analysis.

In order to evaluate the univariate outcomes, Bonferroni correction was used to adjust the alpha level for Type I error ($\alpha/P = 0.025/3$, $p = .01$). The univariate ANOVA, using levels of fan identification as the independent variable and intrinsic motivations as the dependent variable, was statistically significant, $F(1, 360) = 86.37$, $p < .01$, partial η^2

= .19. The univariate ANOVA for social motivations [$F(1, 360) = 52.46, p < .01$, partial $\eta^2 = .13$] and diversion motivations [$F(1, 360) = 16.00, p < .01$, partial $\eta^2 = .04$] were also statistically significant (Table 8, 9). Overall the results indicated that sport consumers' motivations to follow sports using smartphones differed based on the level of fan identification. Specifically, about 19% of the variance in intrinsic motivations was explained by fan identification. Additionally, about 13% of the variance in social motivations and about 4% of the variance in diversion motivations was explained by fan identification. Although the three variables were statistically significant, the effect sizes were considered a small effect (Stevens, 2009).

Table 8

Results of MANOVA: Differences in Smartphone Motivations by Fan Identification

Sources	DV	SS	df	MS	F	p	η^2
Fan ID	Intrinsic	47.21	1	47.21	86.37	<.001	0.19
	Social	79.12	1	79.12	52.46	<.001	0.13
	Diversion	22.74	1	22.74	16.00	<.001	0.04
Error	Intrinsic	196.79	360	0.55			
	Social	542.99	360	1.51			
	Diversion	511.61	360	1.42			
Total	Intrinsic	11184.83	368				
	Social	8454.75	368				
	Diversion	10128.50	368				

Table 9

Means and Standard Deviations for Smartphone Motivations by Fan Identification

DV	Fan ID	<i>M</i>	<i>SD</i>	<i>N</i>
Intrinsic	Low	5.04	0.88	181
	High	5.84	0.58	187
	Total	5.45	0.85	368
Social	Low	4.10	1.32	181
	High	5.09	1.14	187
	Total	4.61	1.32	368
Diversion	Low	4.79	1.39	181
	High	5.39	1.02	187
	Total	5.10	1.25	368

Research Question 6

RQ6: Are sex, age, and fan identification significantly related to a linear combination of three factors of constraints?

To address the sixth research question, a 2x2x2 between-subject MANOVA was conducted with personal, security, and technology constraints serving as the dependent variables and sex, age, and fan identification serving as the independent variables using the same categories of groups defined in research question four (i.e., Millennials and non-Millennials; low and high fan identification; male and female).

The researcher also examined the three assumptions of independence, normality, and equality of covariances. As noted above, the independent assumption was met by checking the respondent's Internet Protocol (IP) address. Second, the researcher examined the results of Q-Q plots and the plots were formed closely with the straight line running at a 45-degree angle, indicating the data were normal. Finally, Box's Test of Equality of Covariance Matrices was examined (Box's $M = 75.02$, $F = 1.72$, $p < .01$) and the result was statistically significant, failing to meet the homogeneity of variance-covariance assumption. However, the nature of the F statistic in MANOVA is robust

against heterogeneous variances, especially when group sizes are fairly equal (Stevens, 2009). Considering the robustness of MANOVA in the presence of violation of the assumption, the researcher proceeded with the analysis. Finally, Barlett's Test of Sphericity was statistically significant ($\chi^2 = 197.69$, $df = 5$, $p < .01$), indicating sufficient correlation between the dependent variables to proceed with the analysis.

The results indicated no statistically significant differences for the following 2-way or 3-way interactions: sex and fan identification (Wilks' $\Lambda = 1.00$, $F(3, 362) = .60$, $p > .05$, partial $\eta^2 = .00$); sex and age group (Wilks' $\Lambda = .98$, $F(3, 358) = .79$, $p > .05$, partial $\eta^2 = .01$); fan identification and age group (Wilks' $\Lambda = .99$, $F(3, 362) = .71$, $p > .05$, partial $\eta^2 = .01$); and sex, fan identification, age group (Wilks' $\Lambda = 1.00$, $F(3, 358) = .20$, $p > .05$, partial $\eta^2 = .00$). The main effect of sex on the linear combination of the three constraints was not statistically significant (Wilks' $\Lambda = .99$, $F(3, 362) = 1.10$, $p > .05$, partial $\eta^2 = .01$). Similarly, the main effect of age on the linear combination of the three constraints was not statistically significant (Wilks' $\Lambda = 1.00$, $F(3, 362) = .43$, $p > .05$, partial $\eta^2 = .00$). Conversely, the main effect of fan identification on the linear combination of the three constraints was statistically significant (Wilks' $\Lambda = .95$, $F(3, 362) = 6.76$, $p < .01$, partial $\eta^2 = .05$). The partial eta-squared value suggested that approximately 5% of the total variance in the smartphone constraints was accounted for by fan identification.

Based on the statistically significant results of multivariate analysis (i.e., fan identification), a univariate analysis was conducted to assess each dependent variable. Prior to conducting a univariate analysis, the Levene's Test of Equality of Error was examined to check for the assumption of homogeneity of variances. The result revealed

non-significant results for two of the dependent variables, including security constraints ($p > .05$) and technology constraints ($p > .05$), meeting the homogeneity of variance assumption. However, one of the dependent variables, personal constraints was statistically significant ($p < .05$), violating the assumption of homogeneity of variance. In the presence of the violation of this assumption, the researcher proceeded with the analysis using the more stringent alpha of $p < .025$ to evaluate F ratios, as suggested by Keppel et al. (1992).

In order to evaluate the univariate outcomes, Bonferroni correction was used to adjust the alpha level for Type I error ($\alpha/P = 0.025/3$, $p = .01$). The univariate ANOVA, using levels of fan identification as the independent variable and personal constraints as the dependent variable, was statistically significant, $F(1, 364) = 7.55$, $p < .01$, partial $\eta^2 = .02$. The univariate ANOVA for technology constraints was also statistically significant, $F(1, 364) = 16.85$, $p < .01$, partial $\eta^2 = .04$. Conversely, security constraints failed to reveal statistically significant results, $F(1, 364) = .24$, $p > .05$, partial $\eta^2 = .00$ (Table 10, 11). Overall the results indicated that the sport consumers' constraints in regards to personal constraints and technology constraints differed based on the level of fan identification. Specifically, about 2% of the variance in personal constraints and about 4% of the variance in technology constraints were explained by fan identification. Based on the results of partial eta square, the effect sizes were considered a small effect (Stevens, 2009).

Table 10

Results of MANOVA: Differences in Smartphone Constraints by Fan Identification

Sources	DV	SS	df	MS	F	p	η^2
Fan ID	Personal	7.55	1	7.55	7.05	.008	0.02
	Security	0.24	1	0.24	0.10	.749	0.00
	Technology	16.85	1	16.85	16.57	<.001	0.04
Error	Personal	389.76	364	1.07			
	Security	845.96	364	2.32			
	Technology	370.15	364	1.02			
Total	Personal	2879.92	372				
	Security	5660.22	372				
	Technology	11606.22	372				

Table 11

Means and Standard Deviations for Smartphone Constraints by Fan Identification

DV	Fan ID	M	SD	N
Personal	Low	2.76	1.03	181
	High	2.40	1.04	187
	Total	2.58	1.05	368
Security	Low	3.64	1.51	181
	High	3.52	1.51	187
	Total	3.58	1.51	368
Technology	Low	5.25	1.08	181
	High	5.73	0.93	187
	Total	5.49	1.03	368

Research Question 7

RQ7: Are sex, age, and fan identification significantly related to a linear combination of two factors of technological perceptions?

To address the seventh research question, a 2x2x2 between-subject MANOVA was conducted with hedonic and utilitarian perceptions serving as the dependent variables and sex, age, and fan identification serving as the independent variables using the same categories of groups defined in RQ4 (i.e., Millennials and non-Millennials; low and high fan identification; male and female).

The researcher examined the three assumptions of independence, normality, and equality of covariances prior to analyzing the data. As noted above, the independent assumption was met by checking the respondent's Internet Protocol (IP) address. Second, the researcher examined the results of Q-Q plots and the plots were formed closely with the straight line running at a 45-degree angle, indicating the data were normal. Finally, Box's Test of Equality of Covariance Matrices was examined (Box's $M = 84.53$, $F = 3.93$, $p < .01$) and the result was statistically significant, failing to meet the homogeneity of variance-covariance assumption. Considering the robustness of MANOVA in the presence of violation of the assumption (Stevens, 2009), the researcher proceeded with the analysis. Finally, Barlett's Test of Sphericity was statistically significant ($\chi^2 = 206.65$, $df = 2$, $p < .01$), indicating sufficient correlation between the dependent variables to proceed with the analysis.

The results indicated no statistically significant differences for the following 2-way or 3-way interactions: sex and fan identification (Wilks' $\Lambda = 1.00$, $F(2, 363) = .43$, $p > .05$, partial $\eta^2 = .00$); sex and age group (Wilks' $\Lambda = 1.00$, $F(3, 363) = .56$, $p > .05$, partial $\eta^2 = .00$); fan identification and age group (Wilks' $\Lambda = 1.00$, $F(3, 362) = .54$, $p > .05$, partial $\eta^2 = .00$); and sex, fan identification, age group (Wilks' $\Lambda = 1.00$, $F(3, 363) = .73$, $p > .05$, partial $\eta^2 = .00$). The main effect of age on the linear combination of the two perceptions was not statistically significant (Wilks' $\Lambda = 1.00$, $F(3, 362) = .34$, $p > .05$, partial $\eta^2 = .00$). On the contrary, the main effect of fan identification on the linear combination of the two perceptions was statistically significant (Wilks' $\Lambda = .81$, $F(2, 363) = 6.76$, $p < .01$, partial $\eta^2 = .19$). Similarly, the main effect of sex on the linear combination of the two perceptions was statistically significant (Wilks' $\Lambda = .98$, $F(2, 363)$

= .3.29, $p < .05$, partial $\eta^2 = .02$). The partial eta-squared value suggested that approximately 19% of the total variance in the perceptions toward smartphone was accounted for by fan identification and about 2% was accounted for by sex.

Since the results of multivariate analysis (i.e., fan identification and sex) were statistically significant, a univariate analysis was conducted to assess each dependent variable. Prior to conducting a univariate analysis, the Levene's Test of Equality of Error was examined to check for the assumption of homogeneity of variances. The result revealed statistically significant results for hedonic perceptions ($p > .05$) and utilitarian perceptions ($p > .05$), violating the assumption of homogeneity of variance. In the presence of the violation of assumption, the researcher proceeded with the analysis using the more stringent alpha of $p < .025$ to evaluate F ratios, as suggested by Keppel et al. (1992).

In order to evaluate the univariate outcomes, Bonferroni correction was used to adjust the alpha level for Type I error ($\alpha/P = 0.025/2$, $p = .01$). The univariate ANOVA, using levels of fan identification as the independent variable and hedonic perceptions as the dependent variable, was statistically significant, $F(1, 364) = 85.41$, $p < .01$, partial $\eta^2 = .19$. The univariate ANOVA for utilitarian perceptions was also statistically significant, $F(1, 364) = 23.20$, $p < .01$, partial $\eta^2 = .09$ (Table 12, 13). Using sex as the dependent variable and utilitarian perceptions as the independent variable failed to reveal statistically significant results due to a more stringent alpha level ($F(1, 364) = 5.0$, $p > .01$, partial $\eta^2 = .01$). Overall, the results indicated that the sport consumers' hedonic and utilitarian perceptions toward smartphones differed based on the level of fan identification. In detail, about 19% of the variance in hedonic perceptions and about 9%

of the variance in utilitarian perceptions were explained by fan identification. Based on the results, the effect sizes were considered a small effect (Stevens, 2009).

Table 12

Results of MANOVA: Differences in Technological Perceptions by Fan Identification

Sources	DV	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Fan ID	Hedonic	67.03	1	67.03	85.41	<.001	0.19
	Utilitarian	23.20	1	23.20	37.41	<.001	0.09
Error	Hedonic	285.66	364	0.79			
	Utilitarian	225.67	364	0.62			
Total	Hedonic	9801.65	372				
	Utilitarian	12018.56	372				

Table 13

Means and Standard Deviations for Technological Perceptions by Fan Identification

DV	Fan ID	<i>M</i>	<i>SD</i>	<i>N</i>
Hedonic	Low	4.57	1.06	181
	High	5.48	0.68	187
	Total	5.03	0.99	368
Utilitarian	Low	5.33	0.90	181
	High	5.90	0.67	187
	Total	5.62	0.84	368

Research Question 8

RQ8: Are sport consumers' motivations, constraints, and technological perceptions significant predictors of smartphone usage for following sport?

To address the eighth research question, the researcher conducted multiple regression analysis using the simultaneous entry method. The motivations, constraints, and technological perceptions (i.e., intrinsic, social, diversion motivations; personal, security, technology constraints; hedonic, utilitarian perceptions) were used as the predictor variables and sport consumers' frequency of smartphone usage was the dependent variable. Prior to analyzing the data, assumptions of multiple regression

including independence, linearity, homoscedacity, normality of residuals, multicollinearity, and outliers were checked (Stevens, 2009). The assumption of independence was met using the IP addresses of the respondents (see RQ4). Subsequently, the assumption of linearity and homoscedacity were checked using the residual plots. The residual plots yielded evidence of a random scatter around zero, which indicated no violation of the assumptions. For the normality assumption, a histogram was examined which showed a visually close straight diagonal on the normal probability plots, fulfilling the assumption. Using the Variance Inflation Factor (VIF), multicollinearity assumption was also checked. All VIF values were smaller (i.e., below 4.79) than the cut-off point of 10, satisfying the assumption (Stevens, 2009). Furthermore, outliers were examined using the Cook's distance value. Typically, a Cook's D value smaller than 1.0 or leverage value close to zero is acceptable (Stevens, 2009). Average Cook's D and leverage were .003 (ranged from .00 to .15) and .022 (ranged from .00 to .15), respectively. Upon meeting all of the assumptions, the researcher proceeded with the analysis.

The regression frequency of smartphone usage on the set of predictor variables was statistically significant, $F(8, 359) = 53.65, p < .01$). The R^2 value for the model was .55, indicating all eight predictors in the regression equation accounted for approximately 55% of the total variance in smartphone usage. The variables of intrinsic motivations ($b = .03, t = 3.45, p < .01$), personal constraints ($b = -.02, t = -4.12, p < .01$), hedonic perceptions ($b = .03, t = 2.89, p < .01$), and utilitarian perceptions ($b = .03, t = 2.11, p < .05$) were significant predictors of sport consumers' smartphone usage. The standardized coefficient (β) indicated that intrinsic motivations ($\beta = .27$) explained the most variance followed by personal constraints ($\beta = -.22$), hedonic perceptions ($\beta = .20$)

and utilitarian perceptions ($\beta = .15$) in a consecutive order. Specifically, for a one point increase in intrinsic motivations, the usage frequency increased .27 points. Similarly, for a one point increase in hedonic perceptions, the usage frequency increased .20 points and utilitarian perceptions by .15 points. Conversely, for a one point increase in constraints, the usage frequency decreased .22 points. Furthermore, social motivations ($b = .00, t = -.08, p > .05$), diversion motivations ($b = .01, t = .31, p > .05$), security constraints ($b = .01, t = 1.04, p > .05$), and technology constraints ($b = .02, t = 1.28, p > .05$) were not statistically significant. Table 14 displays the specific results of the regression analysis.

Table 14
Results of Regression: Predictors of Smartphone Usage

Entered Variables	<i>F</i>	<i>R</i> ²	<i>SE</i>	<i>b</i>	β	<i>t</i>	Cook's D	Leverage
	53.64	0.55					0.003	0.022
Intrinsic			0.01	0.03**	0.27	3.45		
Social			0.01	0.00	0.00	-0.08		
Diversion			0.02	0.01	0.01	0.31		
Personal			0.01	-0.02***	-0.22	-4.17		
Security			0.01	0.01	0.04	1.04		
Technology			0.02	0.02	0.05	1.28		
Hedonic			0.01	0.03**	0.20	2.89		
Utilitarian			0.02	0.03*	0.15	2.11		

Note: * = $p < .05$; ** = $p < .01$; and *** = $p < .001$

Summary of Results

In summary, the researcher used quantitative method using cross-sectional surveys to examine sport consumers' motivations, constraints, and perceptions toward using smartphones to follow sports. The guidelines presented above were followed precisely for the scale validation process. In addition, the characteristics of the MTurk users were examined by using a demographic comparison method using ANOVA to

ensure the sample is representative of the population. The collected data were then analyzed using descriptive analysis, a series of EFAs, a series of ANOVAs, a series of MANOVAs, and multiple regression analysis to address eight research questions. As an exploratory analysis, the study provided meaningful results pertaining to sport consumers' smartphone usage behaviors.

Using the EFAs, three underlying factors for smartphone motivations were identified and included intrinsic, social, and diversion motivations. In addition, three factors including personal, security, and technical error were identified for smartphone constraints, and hedonic and utilitarian perceptions were revealed as underlying constructs of technological perceptions.

Additionally, participants of the current study indicated consuming sports using official sites the most, followed by sport-related apps, social media, text messages, push notifications, and emails when considering various communication channels. Among the sport organizations, the participants followed the NFL the most, followed by the NBA, MLB, NCAA Football, NHL, NCAA Men's Basketball, Fantasy Sports, Professional Soccer, NASCAR, Others, Professional Men's Tennis, NCAA Baseball, NCAA Women's Basketball, Professional Women's Tennis, and WNBA in a consecutive order.

In terms of motivations, intrinsic motivations, which are driven by internal rewards, were found to be the most important motivations that encourage smartphone usage. In regards to constraints, participants indicated technology constraints associated with technical difficulties as the most hindering factor for using smartphones to consume sport. For technological perceptions, sport consumers in this study indicated utilitarian perspective as the most important factor that encourages them to consume sport using

their smartphones.

The MANOVA results also revealed interesting finding as the participants' smartphone motivations differed based on the levels of fan identification (i.e., high, low). Additionally, the level of fan identification was also different for smartphone constraints and technological perceptions. However, multivariate test results for sex and age failed to show statistical significance with using motivations, constraints, and technological perceptions as dependent variables.

Furthermore, the results from multiple regression analysis revealed intrinsic motivations, personal constraints, hedonic perception, and utilitarian perceptions as the important predictors of sport consumers' smartphone usage. Specifically, intrinsic motivations explained the most variance in usage followed by personal constraints, hedonic perceptions, and utilitarian perceptions in a consecutive order.

CHAPTER V

DISCUSSION

The primary purpose of the study was to examine the relationship between technology and sport by examining sport consumers' smartphone usage behaviors related to motivations, constraints, and technological perceptions. Following the research aim, the researcher addressed eight specific research questions:

RQ1: What communication channels (e.g., sport-related apps, social media, mobile web browser, texting) do sport consumers utilize the most in order to follow sport using their smartphone?

RQ2: What motivational factors drive sport consumers to use their smartphones to consume sport?

RQ3: What constraining factors hinder sport consumers from using their smartphones to consume sport?

RQ4: What technological perceptions encourage users to consume sport using their smartphones?

RQ5: Are sex, age, and fan identification significantly related to a linear combination of three factors of motivations?

RQ6: Are sex, age, and fan identification significantly related to a linear combination of three factors of constraints?

RQ7: Are sex, age, and fan identification significantly related to a linear

combination of two factors of technological perceptions?

RQ8: Are sport consumers' motivations, constraints, and technological perceptions significant predictors of smartphone usage for following sport?

The following section will discuss the meaning of the results and provide implications and suggestions for the studies examining technology and sport.

Summary of Results

The results of the study revealed detailed information important to understanding today's tech-savvy sport consumers. Prior to the main analysis, the scale validation process using EFA revealed underlying factor structures for sport consumers' motivations, constraints, and technological perceptions. Three separate EFA were conducted. For the first analysis, the three underlying constructs of sport consumers' smartphone motivations--intrinsic, social, and diversion motivations--accounted for about 62% of the total variance for smartphone consumption motivations. For the second analysis, the three constructs of constraints--personal, security, and technology constraints--accounted for about 58% of the total variance for smartphone consumption constraints. Finally, for the third analysis, two constructs of technological perceptions--hedonic and utilitarian perceptions--accounted for approximately 60% of the total variance for perceptions toward smartphones. The smartphone motivations, constraints, and technological perceptions all displayed an acceptable Cronbach's alpha range (above .70), providing evidence for scale reliability.

For the main analysis, participants indicated use of official sites ($M = 4.92$, $SD = 1.55$), sport-related apps ($M = 4.37$, $SD = 1.79$), and social media ($M = 4.35$, $SD = 1.96$) most frequently as their primary communication channels for following sport using their

smartphones. For the sport categories, participants of the current study followed mainstream sports the most, including the NFL (77.97%), NBA (50.27%), and MLB (45.51%). Additionally, participants were interested in obtaining information regarding their favorite team the most (87.90%), followed by the leagues (66.13%) and players (46.24%). The presented information reveals sport consumers mostly followed mainstream sports using their smartphones in a similar manner to those of offline sport consumers who use traditional media (e.g., television, newspaper) to follow sports (Greenhalgh, Simmons, Hambrick, & Greenwell, 2011).

In addition, utilitarian perceptions, intrinsic motivations, and technological constraints were revealed as important factors when considering sport fans' smartphone usage. In detail, utilitarian perceptions had the highest mean score ($M = 5.62$, $SD = 0.84$) among the technological perception factors, and intrinsic motivations were rated the highest ($M = 5.45$, $SD = 1.18$) among the motivational factors. In terms of factors constraining sport consumers, technology constraints ($M = 5.49$, $SD = 1.09$) were rated the highest. In other words, sport consumers agreed that smartphone functions are easy and useful (i.e., utilitarian perceptions) for sport consumption and expressed they enjoyed information, fanship, entertainment, and economic benefits (i.e., intrinsic motivations) they received from their smartphones. However, participants experienced high levels of discomfort when they encountered technical errors (i.e., technology constraints) associated with smartphones.

In terms of the MANOVA results, sport consumers' motivations, constraints, and technological perceptions each differed based on the level of participants' fan identification levels (i.e., high or low), while sex and age did not contribute to the

difference. For motivations, intrinsic, social, and diversion motivations to follow sports using smartphones differed based on the level of fan identification. Sport consumers with high fan identification had significantly higher levels of intrinsic, social, and diversion motivations when compared to fans with low identification. For constraints, personal and technology constraints were different based on the level of fan identification. Sport consumers with low fan identification had significantly higher levels of personal constraints, while consumers with high fan identification had higher levels of technology constraints. For technological perceptions, both hedonic and utilitarian perceptions to follow sports using smartphones differed based on the level of sport consumers' fan identification. Similar to motivations, sport consumers with high fan identification had significantly higher levels of hedonic and utilitarian perceptions toward smartphones.

Finally, in regards to the multiple regression analysis results, intrinsic motivations, personal constraints, hedonic perceptions, and utilitarian perceptions were identified as significant predictors of sport consumers' smartphone usage. The *t*-statistic values revealed sport consumers were significantly influenced by the internal rewards (e.g., obtaining information, supporting fandom) they received from the smartphone usage, while they were discouraged by personal preferences regarding smartphone technology (e.g., not attractive, not enough time). Additionally, smartphones' functional aspect and the pleasure sport consumers received from using the technology also influenced their decision to follow sport using their smartphones. Likewise, intrinsic motivations explained the most variance in actual usage followed by personal constraints, hedonic perceptions, and utilitarian perceptions. These four significant predictors accounted for approximately 55% of the variance in smartphone usage.

Theoretical Implications

The results of this study revealed several important theoretical implications. The following section will discuss how the scope of this study is applied to the body of literature concerning technology use in sport context. Following the research aim, the theoretical implications extend to (a) identifying the primary source of communication channels using smartphone functions; (b) providing empirical evidence for measuring motivations, constraints, and technological perceptions associated with actual usage; (c) providing empirical evidence for examining differences of sport consumers' motivations, constraints, and technology perceptions based on sex, age, and fan identification; and (d) integrating sport consumption and technology consumption frameworks.

Communication Channels

When considering smartphone functions, a variety of communication channels exist for obtaining sport information, including official sites, sport-related apps, social media networks, text messages, sport fan community, push notifications, and email. Among these communication channels, the participants of this study indicated they used official team sites most frequently ($M = 4.92$, $SD = 1.55$), followed by sport-related apps ($M = 4.37$, $SD = 1.79$) and social media ($M = 4.35$, $SD = 1.96$). This finding reveals sport consumers continue to follow sport information using the official websites, even with the shift in technology trends (e.g., notebooks to smartphones). The sport-related apps were rated the second highest and widely used, as the apps are unique to smart devices. The result indicates that sport consumers understand the advantages of using apps to fully utilize their smartphone functions. One of the plausible reasons why apps were rated lower than official sites is with users' comfort level. The users who are accustomed to

discovering information using computer web-browsers may transfer the same behavior in using mobile-browsers without realizing the existence of apps that are customized for small screens and capable of providing shortcuts. The participants also indicated frequent use of social media, but rated them lower than official sites and apps, as they may have perceived them as a secondary source of information or social media users' opinion. The participants in this study have shown their interest in primary source of information such as official sites and apps the most, while following the popular trend of using social media as an additional information source.

In the sport categories, participants of the current study followed mainstream sports teams the most, followed by the leagues and players. The presented information reflects traditional sport consumption behaviors, supporting mainstream sports and favorite teams; the behavior now echoes with smartphone usage. The results from this study also indicated that male participants followed more sports than female participants, with exceptions of women's sports. However, women's sports were among the least followed sports in the category, indicating that participants in this study were not really interested in following women's sports on their smartphones. One of the possible reasons for this finding may be due to less sponsorship opportunities and media coverage that are available to encourage smartphone users to follow women's sports using when compared to men's sports (Bowen, 2014). For the age group, Millennials (i.e. 33 and younger) generally followed more sports than non-Millennial groups. The Millennials in this study who grew up using the Internet may have been exposed to the information available on smartphones more so than the non-millennial groups. Furthermore, sport consumers with high ID followed more sports than the low ID group with an exception of Professional

Soccer, NASCAR, and NCAA Women's Basketball. According to this finding, sport consumption behaviors of high ID fans, who often consume more sports are not only limited to watching sports, but also following sports on their smartphones. Overall, the findings indicate that sport consumers use their smartphones to follow diverse sports using various communication channels. Using the information provided above, researchers conducting studies in the field of technology or sport may benefit by targeting specific smartphone users in regards to their choice of communication channels.

Recently, researchers have examined communication channels within sport-related apps (Kang et al., in press) to determine which sport information apps were most popular. For general media channels, Clavio and Walsh (2013) determined websites as the most popular communication channel among the traditional media, and smartphone apps among the non-traditional media channels. Considering the limited information available in regards to specific communication channels, the current study took a holistic approach in understanding the overall use of smartphones in the sport context by examining apps in conjunction with other communication channels and the effects of age, sex, and fan identification on usage behaviors. The information presented in this study provided empirical evidence supporting previous literature and contributed additional details that are divided into specific categories of smartphone usage, across different demographics.

Smartphone Motivations

In the current study, three main motivational factors including intrinsic, diversion, and social motivations were identified using EFA (Table 15). Among these factors, participants rated intrinsic motivations the highest ($M = 5.45$, $SD = 1.18$) acknowledging

the benefits they received from smartphones in terms of obtaining sport information, supporting their fandom, and discovering economical entertainment sources. From a sport fan's perspective, staying up-to-date with the sport community, enjoying the sports experience, and finding economical ways to approach sport are important parts of sport fans' activities supported by intrinsic motivations. Intrinsic motivations were also found to significantly predict smartphone usage, explaining the most variance ($\beta = .27$) among the variables examined in this study. In other words, the primary motivation that contributes to smartphone usage is driven by sport consumers' desire to support their fan activities.

Specifically, the connection between intrinsic motivations and smartphone usage is important as it relates to a main advantage of owning a smartphone. One of the greatest benefits of owning a smartphone includes connectivity, which allows users to stay connected anytime, anywhere. For example, sport fans with high level of intrinsic motivations will constantly use their smartphones to meet their fanship, information, economic, and entertainment needs and more frequently use their smartphones when compared to fans who are motivated by other motivations such as diversion and social motivations. The diversion and social motivations were not identified as significant predictors of smartphone usage, contradicting previous studies' findings that revealed importance of the two motivations for websites, fantasy sports, and social media (Dwyer & Kim, 2011; Hur et al., 2011a; Seo & Green, 2008; Witkemper et al., 2012). One of the reasons for this finding may be viewed from a sport fans' perspective. For a sport fan, following up-to-date sport information, enjoying sports, and supporting their fanship (i.e., intrinsic motivations) is the most important motivation that drives sport consumption

using his or her smartphone. In comparison, passing time to watch sport or sharing sport information with other fans may be seen as secondary reasons, which may not necessary influence fans' actual usage. The current finding was also shown with sport fans' app usage behaviors as Kang et al. (in press) revealed information and fanship as an important motivations predicting actual usage. Therefore, when considering sport consumers' smartphone usage, it is important to understand that their primary motivations are driven by their love for sport. Another plausible reasons for this finding may result from an abundance of other media sources. Some participants may use social media sites, fan blogs, or fantasy sports sites using other mediums (e.g., computers, smart TV, tablets) to share their interest with other fans and pass time when bored. Smartphones are often used as a tool to quickly look up information while users are on the move; therefore when it comes to tasks that require bigger screen and time, smartphones may not be the most preferred source of medium.

Moreover, the importance of supporting sport consumers' fan activities (i.e., intrinsic motivations) transfers from one technology medium to another. Currently, smartphones are one of the most convenient technologies available for sport consumers to obtain sport information and engage in sport activities. Prior to the introduction of smartphone technology, Hur et al. (2007) identified convenience, information, diversion, socialization, and economic motivations as important factors contributing to sport consumers' websites usage, which are inclusive facets in intrinsic motivations. Similarly, intrinsic motivations were supportive of entertainment motivations that were identified as one of the most important factors encouraging fantasy football participants (Dwyer & Kim, 2011). Furthermore, the supporting evidence for intrinsic motivations were also

found in Witkemper et al.'s (2012) study that indicated fanship, information, and entertainment motivations as strong predictors for Twitter use in sport. As seen with motivations related to different technologies, sport consumers appears to continuously seek internal rewards as a sport fan, regardless of what technology is being used. Therefore, examination of any technology media capable of encouraging sport consumers' intrinsic motivations may reveal additional evidence to support the result.

Table 15

Operational Definition of the Factors identified in Motivations

Motivations	Inclusion	Operational Definitions
Intrinsic	entertainment, fanship, information, economic	Self-driven motivations based on internal rewards
Social	social influence	Desire to communicate and socialize with others to share similar interests
Diversion	pass time	A way to occupy time or pass time, particularly when bored

Smartphone Constraints

A total of three factors including personal, security, and technology constraints were identified as the underlying structure of smartphone constraints (Table 16). Among the factors, the participants rated technology constraints the highest ($M = 5.49$, $SD = 1.09$), as they agreed that experiencing technical difficulties while following sport is a frustrating experience. Although participants expressed relatively high levels of frustration, technological constraints did not affect usage. Instead, personal constraints related to lack of skill, time, interest, and expense were what hindered participants from actually using smartphones to follow sport. In other words, technological issues may cause users to become irritated, but will not necessarily prevent them from following sport using their smartphones. Just as with any other devices that are prone to errors,

participants in this study may have perceived technology failure as an inherent nature of advanced technologies. On the other hand, personal constraints limiting users based on their personal reasons (e.g., lack of interest) may not be seen as a minor issue, because it relates to one's personal preferences rather than smartphones' technological functions.

One of the possible reasons for the difference between user experience and actual usage derives from the claim that users' perceptions do not always lead to the actual usage (Rahman et al., 2011). In Rahman et al.'s (2011) study, the service quality of the digital library was negatively associated with intention to use because the students felt that having an access to digital library even with poor service quality was better than not having access at all. In a similar manner, the participants in this study probably felt that having access to sport information at their fingertip even with technical errors was better than not having any access. As seen with results above, assessing technology constraints is rather complex, especially when drawing connections between users' experience with constraints and actual usage. In fact, the factors that hinder actual technology consumption are different from one technology to another, including benefit concerns for information technology (Joshi, 1991); skill and expense constraints for social media (Witkemper et al., 2012); security constraints for websites (Hur et al., 2007); time constraints for fantasy sports (Suh et al., 2010); and technical limitation concerns blackboard (Lin et al., 2010) technologies. For smartphone technology, however, personal constraints inclusive of skill, time, interest, expense concerns were the most important elements that discouraged users from using smartphones for sport consumption.

In detail, when participants experienced an increase in personal constraints, the actual time devoted to using smartphones for following sport decreased. Statistically, the

decrease in usage due to personal constraints ($\beta = -.22$) was comparable in the amount of increase in usage due to intrinsic motivations ($\beta = .27$). The relationship between actual usage and users' negative experience is important for several reasons. First, it provides supporting evidence for the unique nature of the user constraints, as they are not directly opposite of users' intention to adopt technologies (Sanford & Oh, 2010). Based on the comparable results between personal constraints and intrinsic motivations, examining constraining factors are equally important as motivating factors to fully comprehend users' decision-making processes associated with smartphones. Second, the current study represents one of the first to identify personal constraints as a major constraining factor, and reveal underlying constructs (security and technology constraints) that are relevant in understanding smartphone usage in sport context. Finally, in order to advance the theoretical frameworks of technology constraints, continuous research is needed to confirm and further validate the presented factor structure including personal, security, and technology constraints and their connection to actual usage.

Table 16
Operational Definitions of the Factors identified in Constraints

Constraints	Inclusion	Operational Definitions
Personal	skill, time, lack of interest, expense	Limitations experienced due to personal preference when using technology
Security	security concerns	Concerns related to release of private information through technology without a consent
Technology	technical difficulties	Irritation experienced when encountering technical errors that are inherent to technology mediums

Technological Perceptions

The current study also identified hedonic perceptions and utilitarian perceptions

as important technological perceptions pertaining to smartphone usage (Table 17). The mean scores for both perceptions were relatively high ($M_{utilitarian} = 5.62$, $M_{hedonic} = 5.04$), when compared to other contributing factors. In fact, the mean score for utilitarian perceptions factor, inclusive of perceived ease of use and perceived usefulness items (TAM; Davis, 1989), was rated the highest among the factors examined in this study. Similar to other studies that examined technologies (e.g., internet) using the TAM's framework (Kim, 2011; Liang & Yeh, 2011; Nasri & Charfeddine, 2012; Tseng et al., 2012), sport consumers in this study also believed smartphones to be easy and useful for following sport. In addition, smartphone users agreed that perceptions toward curiosity and media multitasking behaviors (i.e., hedonic perceptions) are encouraging elements for smartphone technology. For instance, the participants indicated that using their smartphones as a second or third screen while watching television and trying new features on smartphones are perceived enjoyment associated with smartphone usage.

Both hedonic and utilitarian perceptions were identified as significant predictors of actual usage, and between the two, hedonic perceptions ($\beta = .20$) explained more variance than utilitarian perceptions ($\beta = .15$). When purchasing a smartphone, people often think about their needs and benefits they could potentially receive from using their smartphones. For sport consumers however, technological benefits that are directly connected to sport consumption (i.e., hedonic perceptions) are prioritized when compared to technology's functional benefits (i.e., utilitarian perceptions). Unlike utilitarian perceptions, which primarily focus on convenience provided by the technology medium, hedonic perceptions center around enjoyment aspects of task accomplishing behaviors, such as discovering new ways follow sports on smartphones. Thus, the enjoyment

participants received from using smartphones as a second or third screen (i.e., media multitasking) and the ability to try new functions (e.g., new apps) encouraged actual usage more than the perceived utilitarian benefits. The finding is noteworthy for both technology consumption and sport consumption studies, as the information provides insights for understanding how the inherent nature of technological functions influence actual usage and identifies smartphone-specific factors that are important for sport consumers. In addition, future studies should consider the close relationship between sport consumption and hedonic perceptions. The inherent nature of sport fandom drives hedonic perceptions, as sport fans continue to seek for enjoyment from sport, which in part translates to smartphone usage behaviors.

Theoretically, the current study considered technological perceptions separately from the motivating factors. Although hedonic and utilitarian perceptions derive from users' salient beliefs toward technology, they primarily focus on benefits associated with the technology medium itself, rather than considering wide spectrum of motivations that may be unique to specific technology (e.g., smartphones). To overcome this limitation, Davis (1989) expressed the needs for exploring additional contributing factors to the TAM variables depending on the specific technology context. Following his suggestion, the current study made a contribution by identifying utilitarian and hedonic perceptions as underlying constructs of technological perceptions for smartphone usage. Dissimilar to other technologies related to information technology (Davis, 1989), websites (Hur et al., 2011b), mobile games (Liang & Yeh, 2011), and Facebook (Nasri & Charfeddine, 2012) that identified perceived ease of use and perceived usefulness as distinctive variables affecting usage, the current study identified hedonic perceptions and utilitarian

perceptions to both significantly affect actual usage. Thus, when addressing smartphone usage in a sport context, the two core constructs need to be considered in order to fully understand how sport consumers' perceptions lead to actually usage. Overall, the participants indicated that a smartphone's functions provide easy and useful ways to share and discover new ways (e.g., media multitasking) to follow their favorite sports.

Table 17

Operational Definitions of the Factors identified in Technological Perceptions

Technological Perceptions	Inclusion	Operational Definitions
Hedonic Perceptions	perceived curiosity, perceived media multitasking	Enjoyment perceived by conducting tasks using technological functions
Utilitarian Perceptions	perceived ease of use, perceived usefulness	How technology is perceived based on ease and usefulness of the technological functions

Fan Identification

When examining sport consumption behavior, acknowledging the unique characteristics of fans due to emotional and psychological attachment to their favorite players and teams is important (Smith, 1988). The primary reason for the consideration is due to the fact that varying levels of identification contribute to different types of behaviors (Stewart et al., 2003; Wann & Branscombe, 1993). The different types of behaviors were also evident in this study as the results from the MANOVA revealed significant differences in sport consumers' motivations, constraints, and technological perceptions based on different levels of fan identification (i.e., high and low). The level of fan identification has been found to influence how fans respond (Melnick & Wann, 2004).

Motivations. The participants of the current study revealed that intrinsic, social,

and diversion motivations to follow sports using smartphones differed based on the level of fan identification (fan ID), while sex and age did not contribute to the difference. Specifically, sport consumers with high fan ID had significantly higher levels of intrinsic, social, and diversion motivations when compared to fans with low ID. In a traditional sport consumption setting (e.g., attending a live sporting event), fans with high ID are more engaged and involved in fan activities when compared to fans with low fan ID (Gray & Wert-Gray, 2012; Wann & Branscombe, 1993).

Today, smartphones have become a new form of fan activity that allows fans to watch, obtain, connect, and share sport information. By including sport fans' smartphone usage as part of fan activity, a clear relationship is drawn between fan identification and motivations (i.e., intrinsic, diversion, social motivations). Among the three motivations, the fans with high ID rated the intrinsic motivations the highest ($M = 5.84$), which was one of the significant predictors of actual usage. For instance, fans with high ID are highly influenced by their intrinsic motivations as they view their smartphones as a form of entertainment that allows them to support their fandom and obtain sport information at an affordable cost, when compared to fans with low ID who are less affected by these internal rewards. Considering the strong desire of high ID fans to consume sport, they are more likely to view their smartphones as a useful tool to better conduct their fan activities and access sport information.

Constraints. The participants of the current study revealed that personal and technology constraints contributed to significant differences based on the level of fan ID, while sex and age did not contribute to the difference. The more interesting finding in constraints is with the level of fan ID, as participants in this study with low fan ID

expressed significantly higher levels of personal constraints ($M_{low} = 2.76$, $M_{high} = 2.40$), while consumers with high fan ID had higher levels of technology constraints ($M_{low} = 5.25$, $M_{high} = 5.73$). Personal constraints reflect one's personal preferences related to participants' comfort level of skill, time, interest, and expense associated with smartphone technology. Considering fans with high ID spend more time and energy conducting fan activities using their smartphones, the finding reveals that high ID fans do not really mind spending time and effort in learning the skills required to use their smartphones, as much as the low ID fans.

On the contrary, fans with high ID expressed higher level of limitations due to technology constraints. Technology constraints reflect the irritation experienced by users when encountering technical errors that are inherent to smartphones. Sport fans with high ID tend to be more passionate when it comes to sport, as they often view themselves as an extension of their favorite team (Sutton, 1997). As mentioned above, participants in this study were primarily driven by their intrinsic motivations to support their fandom and they may have extended their passion for sport towards smartphone usage. For example, fans with high ID may have been highly affected by technical errors when compared to fans with low ID because smartphone errors are preventing them from conducting fan activities that are most important to high ID fans. On the other hand, fans with low ID probably were less affected by technology errors because they may not be as passionate about using smartphones as a tool to consume sport. Therefore, smartphone usage could be considered as an extension of one's fanship, since high ID fans demonstrated their passion for sport in their smartphone usage.

Technological perceptions. The sport fans in this study also revealed that both

hedonic and utilitarian perceptions to follow sports using smartphones differed based on the level of fan identification, while sex and age did not contribute to the difference. Specifically, sport consumers with high fan ID had significantly higher levels of hedonic and utilitarian perceptions when compared to fans with low ID. The finding may appear to be rather obvious when considering the higher level of sport involvement and commitment for fans with high ID. However, to date, studies have primarily focused on identifying the relationship between sport involvement and commitment with smartphone usage (Ha et al., 2014; Ha et al., in press), and determining effects of fans' involvement, attachment, and fan ID in traditional (i.e., non-technological) sport consumption settings (Laverie & Arnett, 2000; Lock et al., 2012; Reysen et al., 2012; Underwood et al., 2001). The current study represents one of the first to empirically test the differences in technological perceptions depending on sport consumers' level of fan ID.

In terms of hedonic perceptions, high ID fans perceived smartphones as a device that provides enjoyment, since smartphone technology allows fans to look up player statistics instantaneously while watching television and post their comments and pictures on social media sites during the sporting events. The behaviors associated with hedonic perceptions are rather new as they are specific for smart devices. For instance, high ID fans who are highly engaged in sport will find using smartphones as a third screen to look up player statistics, while watching sporting event on a television and playing fantasy sports on a laptop, to be an important part of their sport viewing experience, when compared to low ID fans who may not be engaged in activities involving three screens. The behavior also relates to utilitarian perceptions, where the enhanced viewing experience provided by smartphones is perceived as a useful tool that enables users to

easily follow the sports they love.

Sex and age. Furthermore, the results from current study contradicted previous studies that indicated gender and age as possible reasons for unique types of sport consumption behavior (Brown et al., 2013; Reysen et al., 2012). In the current study, no differences were found for motivations, constraints, and technological perceptions based on sex or age. This finding is noteworthy as the non-significant results based on sex and age may be only relevant for sport consumers using smartphones. In other words, with the wide dissemination of smartphones, the motivations, constraints, and technological perceptions are shown to be similar regardless of sport consumers' sex and age. In America, more than half of the cellular phone subscribers own smartphones, including a wide variety of users in terms of sex and age (comScore, 2014). In technology's introduction stage, young, educated males had traditionally been identified as a group of early adopters (Lee et al., 2010). However, considering the wide use of smartphones today, the underlying reasons for deciding why or why not to use smartphones for following sport does not depend on users' sex and age. But rather, sport consumers' levels of fan ID in regard to their preferences (i.e., motivations, constraints, perceptions) are the contributing factors of their decision-making processes.

Overall, fan identification in this study provided theoretical support for the body of literature claiming differences in fan behaviors depending on their levels of identification (Fisher & Wakefield, 1998; Gray & Wert-Gray, 2012; Melnick & Wann, 2004; Stevens & Rosenberger, 2012; Wann & Branscombe, 1993; Wann et al., 2002). In addition, as seen with the results from this study, fan identification is an important aspect to consider when examining sport consumption behaviors using technologies.

Actual Usage

As mentioned in the motivations, constraints, and technological perceptions sections, four major predictors were identified, including intrinsic motivations, personal constraints, hedonic perceptions, and utilitarian perceptions affecting sport consumers' smartphone usage. In the previous sections, the researcher examined each predictor in detail, but it is also important to examine the four predictors together. Among the four factors, intrinsic motivations explained the most variance in actual usage, followed by personal constraints, hedonic perceptions, and utilitarian perceptions. In other words, participants in this study used smartphones predominantly due to their intrinsic motivations, while being hindered by personal constraints. On average, the participants of this study used smartphones approximately 31 minutes to one hour per day to consume sport ($M = 2.47$, $SD = 1.14$) using a Likert-type scale (*0 to 10 minutes* = 1, *More than 5 hours* = 7). Theoretically, sport consumers may increase their usage if intrinsic motivations, hedonic and utilitarian perceptions are encouraged, while personal constraints are kept to a minimal level. For example, participants who seek entertainment, information, and economical benefits may be further enhanced with easy and convenient function of smartphones, if they have enough time and skills to perform the task to achieve their goal.

The four predictors together revealed interesting findings when compared to previous studies that examined both motivations and constraints related to the Internet (Hur et al., 2007), fantasy sports (Suh, et al., 2010), and social media (Witkemper et al., 2012). For the Internet users, all motivations (i.e., convenience, information, diversion, socialization, economic motivations) increased actual usage, while no significant

relationship existed between actual usage and constraints (i.e., security, privacy, delivery, product quality, service concerns) as they failed to measure one's personal constraints (Hur et al., 2007). On the contrary, Suh et al. (2010) discovered personal constraints to significantly discourage fantasy football participants, revealing similar results to the current study. Likewise, personal constraints hindered social media usage, while wanting to follow their favorite athletes on Twitter motivated the social media consumers. Based on the findings from previous literature, it is evident that motivating and constraining factors differ from one technology to another. Thus the four important predictors identified in the current study including intrinsic motivations, personal constraints, hedonic perceptions, and utilitarian perceptions are unique to smartphone users, potentially due to multi-functional benefits that are advantageous for smartphone use. The finding is also important for several reasons. First, in terms of constraints, smartphone users portrayed similar behaviors to fantasy football participants and social media consumers. However, when considering motivations, smartphone users were driven by intrinsic motivations, which were inclusive of the motivations found with Internet and social media users. Thus, when considering the four predictors identified in this study as a whole, smartphone users are different than other technology users (i.e. Internet, fantasy sports, social media) in what motivates and hinders sport consumers from using technologies. Second, the current study not only presented the motivations and constraints that are relevant to smartphone users, but also empirically tested the four predictors that are directly related to sport consumers' actual usage. Theoretically, the findings from this study may be used as a basis for future studies examining multi-functional devices or smart devices.

However, the relationship between the four predictors and actual usage should be approached with caution as they are only relevant to sport consumers who follow sport using their smartphones. When applying the findings to different technology, the results may vary depending on the task conducted on a device (e.g., smart watches) and characteristics of sport consumers (e.g., unique behaviors only representing specific sports). Furthermore, previous studies examining technology consumption behaviors were exploratory in nature and considered users' intention and actual usage at the same time (Jiang, 2009; Jung et al., 2009; Lee et al., 2010; Tseng et al., 2012). Their results revealed that behavior intention significantly affects actual behavior in consuming technology. However, the common practice of collecting data regarding self-reported intention and actual usage simultaneously was criticized, as it could potentially skew the study results (Tao, 2009). In other words, intention should have been measured prior to using the technology, and actual usage should have been measured after the consumption because users' intention does not always lead to actual usage (Rahman et al., 2011). Considering the widespread use of smartphones and the criticism mentioned above, the current study took a different approach to understand how often consumers used smartphones (actual usage) in order to provide meaningful results capturing the relationship between sport consumption behaviors and actual usage.

Integration of Technology and Sport Consumption

In order to examine sport consumers who are a large part of technology consumers, bridging the gaps between technology and sport by integrating the literature from the both disciplines was necessary. Previously, studies examining technology consumption heavily focused on determining users' intentions to adopt technology (Kim,

2011; Liang & Yeh, 2011; Nasri & Charfeddine, 2012; Tseng et al., 2012), while studies examining sport focused on fan behaviors and how they affects sport consumption (Gwinner & Swanson, 2003; Gray & Wert-Gray, 2012; Hu & Tang, 2010; Levin et al., 2008; Stevens & Rosenberger, 2012). Recently, researchers have considered today's wide use of technology in sport and made attempts to close the gap by adopting technology model such as TAM (Davis, 1989) in sport (Ha et al., in press; Hur et al., 2011a; 2012; Kang et al., in press). However, studies examining specific technology use in sport are still limited, as the foundation integrating the frameworks from the two disciplines are still being developed (Ha et al., in press). As mentioned above, sport fans perceive today's technology as a tool that may assist them to conduct sport activities. Therefore, in order to understand sport consumption behaviors that are largely being consumed using today's technology, it is necessary to bridge the gap between the technology and sport consumption literature.

Beyond the integration, the current study represents one of the first attempts to take a holistic approach to consider motivations, constraints, and technological perceptions to examine sport consumers' smartphone usage. Prior to the current study, gaps in the literature were determined as the researchers in technology focused on users' perceptions and constraints limited to the specific technology mediums (Joshi, 1991; Kim, 2011; Kim & Kankanhalli, 2009; Lapointe & Rivard, 2005; Liang & Yeh, 2011; Lin et al., 2010; Nasri & Charfeddine, 2012; Rhoda, 2010; Sanford & Oh, 2010; Tseng et al., 2012). In the sport consumption literature, various studies focused on sport consumers' motivations and constraints by emphasizing the importance of sport concepts such as sport involvement and commitment (Dwyer & Kim, 2011; Hardin et al., 2012; Hur et al.,

2007; 2011b; Suh et al., 2010; Witkemper et al., 2012). In an attempt to bridge this gap, the scope of the study used sport consumers as a focal point and smartphone usage behavior as a tool that facilitates sport consumption behaviors. With the integration, items such as “I use my smartphone to increase the quality of my sports fan experience” from the utilitarian perceptions were generated, capturing both the technological and sports aspect of consumption behaviors.

Furthermore, limitations also existed in both disciplines as studies mentioned above measured perceptions separately from constraints, measured motivations and constraints without considering the technological perceptions, or solely focused on identifying motivations. In order to comprehensively understand factors from both disciplines, integration was the first step, and taking a holistic approach to examine motivations, constraints, and technology perceptions was the second step. As seen in the multiple regression results, intrinsic motivations, personal constraints, hedonic perceptions, and utilitarian perceptions significantly predicted actual usage. If only motivations were measured, the results may have been skewed due to potential underlying factors (constraints, technological perceptions) that could have contributed to the outcome of the study. With this finding in mind, future studies should acknowledge the importance of using theoretical frameworks with the three elements (i.e., motivations, constraints, and technological perceptions) presented in this study to further understand sport consumers’ behaviors using the latest technologies. Moreover, this study has shown that integration is not only necessary, but also possible when considering a topic that relates to both sport and technology. The meaningful results provided by the three elements will allow studies in this area to move forward by using the current frameworks

as a starting point to further understand user behaviors that are specific to the technology medium being measured.

Practical Implications

The results from this study also extend to sport managers and mobile marketers, as the findings provide information necessary to take advantage of numerous opportunities available to further enhance current and new sport consumers' experiences. Smartphones are useful tools that are capable of facilitating sport consumption processes when practitioners are able to understand important facets that motivates and hinders sport consumers' smartphone usage. The services provided by smartphones have been found to facilitate effective communication processes, which have been seen as a part of a success strategy in the sport industry (Clavio & Walsh, 2013).

Communication Channels

The first step to a successful strategy is with the choice of communication channels. Smartphone users can obtain sport information using the official sites, apps, social media, text messages, push notifications, and emails. Among these channels, the participants from this study indicated use of official sites, sport-related apps, and social media as their primary communication channels for following sport. The usage for each channels including official sites, apps, and social media significantly differed based on the level of fan ID (i.e., low, high), while no significant difference was found for sex and age. In the sport categories, participants of the current study followed mainstream sports the most (i.e., NFL, NBA, MLB), and were interested in obtaining information regarding their favorite team the most followed by leagues and players. Taking the results into consideration, sport managers should primarily focus on disseminating information

through the official sites, sport-related apps, and social media sites. If the usage for each channel is different based on an organization's purpose, official sites should reveal the most important information as the current study's participants indicated official sites as the primary communication channel. In addition, practitioners should focus on understanding their fan base in order to create ways to encourage more involvement for low ID fans, while continuing to satisfy high ID fans focusing on team activities.

Considering the primary communication channel identified above, sport managers need to re-examine the organization's mobile websites, especially paying attention to the team's official sites. Smartphone technology today is capable of accessing the websites for desktop browsers as well as the mobile browsers. But bearing in mind of large amount of data that are available on official sites, customized mobile websites should be created. For instance, mobile websites should provide highlights of the team information rather than showing the entire content considering the screen size. For user-friendly navigating experiences, minimum efforts should be made to search, swipe, or press the needed information. Reflecting upon today's mobile trend, an organization's website needs to be optimized for the smartphone consumers by creating a mobile browser that is customized for easy navigation.

Additional benefits exist with the creation of mobile-specific websites. Once the website is created, organizations should formulate a way to encourage fan involvement of low ID fans while providing additional benefits to increase fan satisfaction for high ID fans. As mentioned above, sport consumers' intrinsic motivations, which includes information, entertainment, and economic benefit is an important factor that predicts consumers' actual usage. Sport managers could well use this information to designate a

space on a m.sites to create a promotional campaign by engaging fans to play games (e.g., trivia) to win team merchandise at a discounted price to encourage sport consumers' intrinsic motivations. Additionally, the interface of the m.sites need to be carefully organized to provide team insights that encourages information and entertainment aspect of fan motivations, which in turn will help to encourage fans with low ID. Practitioners should view mobile website as an additional media outlet that has potential to reach the current fan base as well as millions of mobile consumers who are not familiar with sport websites.

Smartphone-Specific Factors

The second step to a successful strategy is the understanding of important factors that influence sport fans' smartphone usage. By understanding how smartphones are perceived and what motivates and hinders sport consumers, practitioners will be able to design a plan that stimulates motivating factors, while avoiding the constraining factors. For instance, when generating mobile content, the consumers should view the information as an easy, useful, fun, and economical way to follow their favorite sports. At the same time, the content needs to be approachable without presenting high learning curves, which requires users to spend a lot of time learning the necessary skills.

A prime example of a successful mobile marketing effort was the New Jersey Nets' Gowalla campaign that took place in 2010 when Nets' were still playing in New Jersey. In this campaign, the Nets' goal was to create 'buzz' about the new season, and provide ways to get fans engaged. The plan was simple, where users downloaded geolocation application *Gowalla*, to look for virtual game tickets hidden throughout the city of New York (e.g., sports bars, gyms, parks). The found tickets were exchanged for

real game tickets or merchandises as a prize. The winning strategy represented an easy and fun way to get free goods that are useful for sport fans. The *Gowalla* app's simple presentation of the New York City map, similar to *Google Maps* also took part in minimizing the fans' learning curve to participate. As a result the campaign was able to increase attendance to the game by 15.2% when compared to the prior season (Vayner Media, 2010). Recently, EA Sports launched similar match-day advertising campaign for the FIFA 2014 video game, using geo-targeted function to specifically attract soccer fans within stadium range on match days. Again, the GPS function embedded in smartphones allow practitioners to target audiences who are more likely to be interested in playing soccer video games (Redcat Digital, 2014).

As shown in the previous examples, understanding what affects sport consumers' actual usage is the key to formulating a successful strategy. Based on the findings from this study, the mobile campaigns can be enhanced by considering the hedonic perceptions. Smartphones offer fun and pleasurable experiences to encourage usage. As mentioned above, participants of this study perceived benefits of media multitasking and of discovering new ways to follow sport as enjoyment associated with smartphone usage. When creating a marketing campaign, sport managers need to consider media integration to satisfy smartphone users' hedonic perceptions. For example, ESPN News often encourages fans to text in their response to the presented news. This approach not only allows fans to media multitask (e.g., use smartphones while watching the news), but also provides a new way for fans to become part of the news. As a cost-effective approach, sport managers need to pay attention to their current media campaign and discover ways to encourage sport fans to use their smartphones as a second or third screen, embracing

their hedonic perceptions.

Furthermore, sport managers need to work with mobile developers to find ways to minimize the constraining factors associated with the smartphone technology. The current study's participants indicated lack of skill and interest, not having enough time, and expense related to smartphones as factors that discourage actual use. Although creative approaches to mobile marketing that encourage sport consumers' motivations are expected to counter these constraining factors, practitioners need to take proactive approaches to reduce potential constraints. For example, increases in app usage have occurred when developers provided short and precise on-screen instructions for users first downloading the apps (Bedford, 2014). Sport managers could take a similar approach by educating sport consumers on how to better utilize their smartphones to obtain sport information or enhance their fan experiences. Additionally, finding ways to simplify organizations' current apps and mobile websites will also reduce users' constraining factors.

Moreover, considering intrinsic motivations, personal constraints, hedonic perceptions, and utilitarian perceptions that influence actual usage, sport managers need to establish a clear goal for creating a marketing campaign. The Nets' campaign's end goal was to get more fans to the game. If the goal is to encourage intrinsic motivations by providing useful information, an approach should provide convenient and easy ways (e.g., QR codes, text messages) to enhance utilitarian perceptions for fans to access the disseminated information. Having a clear goal in mind and developing a way to integrate the motivations, constraints, and perceptions (i.e., intrinsic motivations, personal constraints, hedonic and utilitarian perceptions) will allow sport managers to take

advantage of the available resources in sport consumers' hands.

Fan Identification

Market segmentation based on fan ID has been a common practice for sport managers to better tailor marketing efforts to satisfy fans with different needs (Mullin et al., 2007). In regards to the technological perceptions in this study, fans with high ID were more engaged in media multitasking behaviors and found smartphones to be much easier and useful when following sport, in comparison to fans with low ID. Sport fans with high ID also portrayed more engagement in learning sport information, following sports during their free time and sharing sport experiences with other fans. On the other hand, fans with high ID cared less about personal and security concerns, while expressing higher level of irritation when encountering technological errors associated with smartphone technologies. The finding reflects upon common behaviors of high ID fans that are not affected by the outcome of their favorite team's performance (Sutton et al., 1997).

Although personal and security concerns were not indicated as salient constraints for fans with high ID, there was a distinction between fans with high ID and low ID in terms of how they perceived smartphones (i.e., motivations, constraints, technological perceptions). The fans with high ID were far more engaged with their smartphones as they perceived them as an important tool to conduct their daily fan activities, when compared to fans with low ID. This distinction is highly relevant for practitioners in considering market segmentation of smartphone users. Using the information, sport managers are able to tailor their marketing and promotion efforts. When creating a marketing strategy to further engage high ID mobile fans, sport managers should focus on

creating mobile content that provides detailed sport information beyond what is offered on computer web browsers and social media sites. In other words, creating content exclusive for mobile users will provide an additional outlet for high ID fans to thrive in obtaining, sharing, and embracing their fan activities. The mobile exclusive content will also benefit the low ID fans. However, additional benefits need to be provided considering their lower interest level in sport. Instead of providing typical types of event giveaways, on-going efforts such as reward point systems or exclusive goods only available for mobile users would provide incentives even for low ID fans to become engaged.

In addition, the findings from this study suggest that there is no difference in motivations, constraints, and technological perceptions based on sport consumers' sex and age. This poses a challenge for sport managers in terms of market segmentation. Thus, when creating a mobile marketing strategy, wide audience approaches should be considered. When designing mobile-specific content, icons, fonts, interfaces, and colors should appeal to audiences of all ages and sexes. For example, when creating sports information-based content, pictures and fonts should consider eyesight of both old and young fans. Finding the happy medium addressing both age groups is important as it reflects upon the ease and usefulness (utilitarian perceptions) of the provided service. According to Schenker (2014), the best web design practice is shown with differentiating the font size/style between the headings and body. This is a common practice shown with today's popular apps (e.g., *Twitter*, *Yahoo Sports*, *ESPN ScoreCenter*) and with this in mind, sport managers are recommended to work with mobile designers to identify best practices that provides all-inclusive approaches for their fan base.

Future Research

The current study is exploratory in nature as it presents one of the first studies to take a holistic approach in examining sport consumers' motivations, constraints, and technological perceptions toward smartphones. Theoretically, the current study laid the foundation using EFA to identify three factors each for motivations (i.e., intrinsic, social, diversion) and constraints (i.e., personal, security, technology), followed by two factors in technological perceptions (i.e., hedonic, utilitarian). In order to further advance the theoretical frameworks in scale development, future studies could confirm the scale reliability and construct validity of the factor structures using the CFA. Additionally, considering the fast-paced technology trends, continuous studies are needed in order to accurately reflect upon the influence of technology consumption behaviors in sport context. Specifically, longitudinal studies will be able to capture the progress of the sport consumers' changing behaviors, if applicable.

To date, our understanding of sport consumption using technologies is still limited as majority of the studies examining the behaviors are at a beginning stage to identify factors that influence actual usage (Ha et al., in press; Hur et al., 2012; Kang et al., in press). In order to advance our understanding for sport consumers' technology usage behaviors, moderating and mediating effects should be considered with more detailed demographic information. The current study only focused on sex and age variables as they were found to influence consumption behaviors (Brown et al., 2013; Reysen et al., 2012). However, considering the non-significant results, the future studies should empirically test mediating and moderating effects of the sex and age in addition to testing various demographic variables such as economic status, race, categories of sport

interests, and location. Expanding upon the demographic variables, the current study focused on consumers residing in the United States. Future study could take a global approach in identifying the different behaviors portrayed by fans living in different regions, considering the penetration of the mobile networks.

Furthermore, the current study took a general approach to consider both sport participants and spectators. Potentially, three categories of sport fans may be examined depending on whether they are a participant, spectator, or both. By separating fans into three categories, the influential factors predicting actual usage may reveal different results reflecting upon usage behavior patterns. Specifically, depending on the activities sport consumers engage in (e.g., obtaining information versus tracking fitness progress), motivations, constraints, and technological perceptions toward smartphones may also be different. In addition, depending on the purpose of the study, measuring consumers' sport commitment and involvement based on the three categories (i.e., participants, spectators, and the ones who are engaged in both) may provide additional insights towards understanding sport consumption behaviors using smartphones.

Furthermore, as mentioned above, challenges still exist with non-fans who are smartphone users. The current study focused on examining current sport fans; however, in order to overcome the challenges involved with attracting new fans to sport, future studies should focus on identifying best practices for reaching out to the new consumers by using non-fans, who are somewhat interested in sport, as study participants. Most importantly, a continuous effort is needed to examine technology use in sport, in order to advance the studies in this area forward by developing and empirically testing the factors that are applicable to changing technology mediums.

Summary

The current study explored the relationships between sport and technology by examining sport consumers' motivations, constraints, and technological perceptions related to smartphone usage. The study employed a cross-sectional survey design to collect data from MTurk users who resides in the United States. The collected data were assessed with EFA, descriptive statistics, ANOVAs, MANOVAs, and multiple regression analysis to uncover effective ways for sport managers to engage sport consumers using smartphone technology.

Specifically, three unique factors of motivations (i.e., intrinsic, social, diversion), three factors of constraints (i.e., personal, security, technology), and two factors of technological perceptions (i.e., hedonic, utilitarian) were identified for smartphone usage in sport context. Among these factors, intrinsic motivations, personal constraints, hedonic perceptions and utilitarian perceptions were found to significantly predict actual usage. In addition, sport consumers also indicated to follow the official sites the most, sport-related apps the second, and social media sites the last. Among the sports they followed, the NFL was ranked the highest, followed by the MLB and NCAA football. Within these sports, sport consumers followed their favorite team the most, leagues the second, and players the third. Further analysis also revealed that sport consumers' behaviors significantly differed based on the level of fan identification (i.e., high or low).

In conclusion, the results from this study provided a holistic view to better understand sport consumers who use smartphones for following sport. The information provided in this study is particularly useful when designing a mobile marketing campaign

to better engage current fans as well as potential consumers. In addition, sport managers will be able to further encourage sport consumers' motivating factors, while reducing the constraining factors by considering the technological perceptions of the smartphones. Furthermore, the current study's proposed scale could be used to assess motivations, constraints, and technological perceptions associated with actual usage to reflect upon specific characteristics of the fan identification.

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APPENDIX A

Sport Fans' Smartphone Usage Dissertation Survey

The following items are concerned with how you feel about following sports using your smartphone. Please indicate how much you agree or disagree with each statement by selecting the appropriate number using a 7-point Likert-type scale (*Strongly Disagree* = 1, *Strongly Agree* = 7).

Motivations

Information

- I learn about things happening in the sport industry using my smartphone.
- Sport-related information obtained from my smartphone is useful.
- I can get information about various sports such as team performance, player profiles, and game schedules through my smartphone.

Social

- I like to chat with people about sports using my smartphone.
- My smartphone gives me a chance to discuss sport with other people.
- I like to share my opinions about sport teams and players using my smartphone.
- I enjoy debating sport-related issues using my smartphone.

Entertainment

- I use my smartphone to follow sports because they are exciting.
- I use my smartphone to follow sports because they are amusing.
- I use my smartphone to follow sports because they are cool.

Pass Time

- I use my smartphone to follow sports during my free time.
- I use my smartphone to follow sports because it passes the time away, particularly when I'm bored.
- I use my smartphone to follow sports because it gives me something to do to occupy my time.

Fanship

- One of the main reasons I use my smartphone to follow sports is that I consider myself a fan (i.e., fan of football, fan of sports games, fan of fantasy football).

- One of the main reasons I use my smartphone to follow sports is that I am a huge fan of sports in general.
- One of the main reasons I use my smartphone to follow sports is that I consider myself to be a big fan of my favorite team, sport, or activity.

Economic

- I like to follow sports using my smartphone because the services (e.g. apps, mobile-browser) are usually free.
- I like to follow sports using my smartphone because I like to get my money's worth for the data usage fee.
- I like to follow sports using my smartphone because they are very affordable.

Technological Perceptions

Curiosity

- When friends or families recommend smartphone functions (e.g., apps, QR codes, websites) to follow sports, I want to try them.
- I enjoy exploring new functions on my smartphone to follow sports.
- When I discover new things I could do on my phone to follow sports, I want to try them.

Media Multitasking

- I often find myself using my smartphone and other media/devices (e.g., TV, computer, radio) simultaneously to follow sports.
- I often open and use my smartphone to follow sports while doing other activities on my smartphone.
- I often chat with my friends while at the same time following sports on my smartphone.

Ease of Use

- Learning to operate my smartphone to follow sports is easy for me.
- I would find it easy to get my smartphone to do what I want it to do when following sports.
- My interaction with my smartphone to follow sports is clear and understandable.

Usefulness

- Use of a smartphone can increase the quality of my sports experiences.
- Use of a smartphone can enhance the productivity of my fan lifestyle.
- Use of a smartphone can assist my fan lifestyle.

Constraints

Time

- I do not have enough time to use my smartphone to follow sports.
- I would rather spend time with friends or family than use my smartphone to

follow sports.

- I am way too busy to follow sports using my smartphone because of my study or work obligations.

Lack of Interest

- I am not interested in following sports using my smartphone.
- I do not enjoy using my smartphone to follow sports.
- Using my smartphone to follow sports is not attractive to me.

Skill

- Following sports using my smartphone is not easy.
- I am not good at certain technical skills required to use my smartphone to follow sports.
- I do not know where or how to use my smartphone to follow sports.

Security

- When following sports, I don't feel secure sending my personal information using my smartphone (e.g., purchasing game tickets).
- When following sports, I am concerned that my personal/financial information on my smartphone might be shared with others without my consent.
- When following sports, I am uncomfortable giving my credit card number using my smartphone.
- When following sports, I am concerned about the security of personal information stored on my smartphone.

Expense

- Using my smartphone to follow sports requires more money than I can spend.
- The price I pay for the smartphone usage to follow sports (including the device, services, apps) is way too high.
- The expense related to smartphone usage discourages me from following sports using my smartphone.

Technology Error

- I feel irritated when my smartphone does not work well to follow sports.
- Experiencing an error while following sports is a frustrating experience.
- I feel irritated when my Wi-Fi/3G/4G connections are too unstable to follow sports.

Fan Identification

- I consider myself a sports fan
- My friends see me as a sports fan.
- Following sports is the most enjoyable form of entertainment.
- My life would be less enjoyable if I couldn't follow sports.
- Being a sports fan is very important to me.

Smartphone Usage

- What is your main purpose for smartphone usage?
 - To obtain sports information (e.g., ESPN, Yahoo!Sportacular); To conduct sport activities (e.g., IMapMyRIDE, Golf GPS); To obtain sports information and conduct sports activities; Others (Fill in box)
- How frequently do you believe you use your smartphone for sports consumption (e.g., searching/obtaining sport-related information, watching games, etc.)
 - Very rarely; Rarely; Somewhat rarely; Occasionally; Somewhat frequently; Frequently; Very frequently
- Given that I have access to my smartphone, I predict that I would use my smartphone to follow sports
 - Very unlikely; Unlikely; Somewhat unlikely; Occasionally; Somewhat likely; Likely; Very likely
- How long do you typically use your smartphone to follow sports?
 - 0-1 minute; 1-10 minutes; 10-30 minutes; 30 minutes-1 hour; 1-3 hours; 3-5 hours and more than 5 hours a day
- How do you follow sports using your smartphone? (please select all that apply)
 - Social media (e.g., Twitter, Facebook, YouTube); Official site (e.g., espn.go.com, nba.com, yankees.com); Push notification; Sport fan community (e.g., blogs); Sport-related apps, Text, Email
- What sports do you follow using your smartphone? (please select all that apply)
 - NFL; NBA; WNBA; NCAA Men's Basketball; NCAA Football; Pro. Men's Tennis; Pro. Women's Tennis; NASCAR; Pro Soccer; Other (Fill in box)

Demographic Information

- What sports are you interested in? (please select all that apply)
 - NFL; NBA; WNBA; NCAA Men's Basketball; NCAA Football; Pro. Men's Tennis; Pro. Women's Tennis; NASCAR; Pro Soccer; Other (Fill in box)
- Gender
 - Male; Female
- Age : Fill in box
- Household Income:
 - Under \$24,999; \$25,000 - \$34,999; \$35,000 - \$44,999; \$45,000 - \$54,999; \$55,000 - \$64,999; \$65,000 - \$74,999; \$75,000 - \$84,999; \$85,000 - \$94,999; \$95,000 - and above
- Ethnicity:
 - White/Caucasian; Black/African American; American Indian/Native American; Pacific Islander; Asian/Asian American; Latino/a or Spanish Origin; Multiracial/Biracial; Other
- Highest level of education completed
 - Less than high school degree; High school degree; Associates (2-yr)

degree; Bachelor's (4-yr) degree; Master's degree; Higher than a Master's degree (i.e., PhD, MD, JD, etc.)

- What type of smartphone do you own?
 - Apple iPhone; Google Android; Research in Motion Blackberry; Windows phone; Other

APPENDIX B

Exploring Motivations, Constraints, and Perceptions toward Sport Consumers'

Smartphone Usage

September 15, 2014

Dear Sport Fans:

You are being invited to participate in a research study by answering the attached survey about sport fans' smartphone usage to follow sport. There are no known risks for your participation in this research study. The information collected may not benefit you directly. The information learned in this study may be helpful to others. The information you provide will be used to address research questions regarding what communication sport fans use to consume sport what motivations drive this usage, what constraints hinder their usage and how fan identification impacts the relationship between sport and technology consumption behavior. Your completed survey will be stored in a pass-code secured external hard drive. The survey will take approximately 20 minute to complete.

Individuals from the Department of Health and Sport Sciences, the Institutional Review Board (IRB), the Human Subjects Protection Program Office (HSPPO), and other regulatory agencies may inspect these records. In all other respects, however, the data will be held in confidence to the extent permitted by law. Should the data be published, your identity will not be disclosed.

Taking part in this study is voluntary. By completing this survey you agree to take part in this research study. You do not have to answer any questions that make you uncomfortable. You may choose not to take part at all. If you decide to be in this study you may stop taking part at any time. If you decide not to be in this study or if you stop taking part at any time, you will not lose any benefits for which you may qualify.

If you have any questions, concerns, or complaints about the research study, please contact: Sun Kang at sun.kang@louisville.edu or (747) 333-9656

If you have any questions about your rights as a research subject, you may call the

Human Subjects Protection Program Office at (502) 852-5188. You can discuss any questions about your rights as a research subject, in private, with a member of the Institutional Review Board (IRB). You may also call this number if you have other questions about the research, and you cannot reach the research staff, or want to talk to someone else. The IRB is an independent committee made up of people from the University community, staff of the institutions, as well as people from the community not connected with these institutions. The IRB has reviewed this research study.

If you have concerns or complaints about the research or research staff and you do not wish to give your name, you may call 1-877-852-1167. This is a 24 hour hot line answered by people who do not work at the University of Louisville.

Sincerely,

T. Chris Greenwell, PhD

Marion E. Hambrick, PhD

Sun J. Kang, Doctoral Candidate

CURRICULUM VITA

Sun J. Kang

Work Address

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Kangsj78@gmail.com

EDUCATION

- PhD Educational Leadership & Organizational Development**
Specialization: Sport Administration
University of Louisville, Louisville, KY, Expected May 2015
Dissertation: Exploring motivations, constraints, and perceptions toward sport consumers' smartphone usage
- MS Sport Management**
Barry University, Miami Shores, FL, Aug. 2011
- MBA General MBA**
Barry University, Miami Shores, FL, Aug. 2011
- AAB Golf Complex Operation & Management**
Golf Academy of America, San Diego, CA, April 2008
- BA Art Studio**
University of California Davis, Davis, CA, June 2002

ACADEMIC & PROFESSIONAL WORK EXPERIENCE

University of Louisville **Aug. 2012 – May 2013**
Sport Administration Program, Department of Health & Sport Sciences
Graduate Research Assistant

Ocean View Country Club <i>Consultant</i>	Apr. 2008 – Aug. 2009
Ocean View Country Club <i>Senior Project Manager / Public Relations Manager</i>	Jan. 2004 – June 2007
Ocean View Country Club <i>Human Resource Manager</i>	Dec. 2002 – Dec. 2003

TEACHING EXPERIENCE

University of Louisville Instructor:	Jan. 2014 – Dec. 2014
SPAD 404 Financial Principles of Sport	

University of Louisville Guest lectures:	Feb. 2012 – Present
SPAD 490 Senior Seminar <i>Social strategy at Nike</i>	
SPAD 404 Financial Principles of Sport <i>Athlete endorsement and scandal</i>	
SPAD 281 Principles of Sport Management <i>Developing career in a golf industry</i>	
SPAD 383 Sport Marketing <i>Strategies to target consumers in a niche market</i>	
SPAD 703 Sport Consumer Research <i>Technology consumption in sport</i>	

Class Shadowing:

- Shadow a mentor/instructor for a semester to learn about different teaching techniques and classroom management styles.
 - SPAD 383 Sport Marketing
 - SPAD 530 Promotion and Publicity
 - SPAD 489 Legal Aspects of Sport Administration
 - SPAD 561 Sport Communication

University of Louisville Athletics Olga S. Peers Academic Center for Student Athletes College Reading & Learning Association (CRLA) certified Tutor	Spring 2012, Fall 2014
--	-------------------------------

Barry University

Summer 2011

Guest Lectures:

SES 621 Sport Ethics

RESEARCH

Publications

Kang, S. J., Ha, J. P., & Hambrick, M. E. (in press). A mixed-method approach to exploring the motivations of sport-related mobile applications among college students. *Journal of Sport Management*.

Ha, J. P., **Kang, S. J.,** & Ha, J. (in press). A conceptual framework for adoption of smartphones in a sport context. *International Journal of Sports Marketing and Sponsorship*.

Kluka, D. A., & Goslin, A. E. (in press). International sport business management [Case study chapter]. Submitted case study for Scottsdale, AZ: Holcomb-Hathaway Publishing.

Hambrick, M. E., **Kang, S. J.** (2014). Pin it: Exploring how professional sports organizations use Pinterest as a communications and relationship-marketing tool. *Communication & Sport*. Advance online publication. doi: 10.1177/2167479513518044

Kim, H., & **Kang, S. J.** (2012). *Empirical evaluation of the sport website contents: A case of PGA/LPGA Grand Slam Websites*. Saarbrücken, Germany: LAP LAMBERT Academic Publishing.

Scholarly Presentations

Kang, S. J., Ha, J. P., Greenwell, T. C., & Hambrick, M. E. (2015, October). *Sport consumers in the smartphone age: Examining motivations, constraints, and technological perceptions of smartphone users*. Submitted for presentation at SMA 2015 conference, Atlanta, GA.

Kang, S. J., Itoh, M., & Choi, N. (2015, September). *A comparison of Japanese and American students' sport-related mobile application usage*. Submitted for presentation at EASM conference, Dublin, Ireland.

Kang, S. J., Hanna, C., Hambrick, M. E., & Greenwell, T. C. (2015, May). *Exploring smartphone usage: What are fans doing with their smartphones?*

Accepted for 2015 NASSM conference, Ottawa, Ontario.

Kang, S. J., Greenwell, T. C., & Hambrick, M. E. (2015, April). *Developing a scale to measure sport consumers' smartphone usage*. Presented at 2015 Spring Research Conference, Louisville, KY.

Ha, J. P., Kim, Y. K., **Kang, S. J.,** & Park, S. H. (2014, May) *Sport consumers in a 'Smart Sport' (SS) age: Smartphone and Sport*. Presented at NASSM conference, Pittsburgh, PA.

Kang, S. J., Rice, J. A., & Hambrick, M. E. (2013, October). *Overcoming niche sport disadvantages with social media*. Presented at SMA 2013 conference, Albuquerque, NM.

Kang, S. J., Hambrick, M. E., & Ha, J. P. (2013, May). *A qualitative study exploring the motivations of sport-related mobile applications approach*. Presented at 2013 NASSM conference, Austin, TX.

Kang, S. J. & Naeger, D. J. (2012, November). *All scrambled out: Creative approaches to running a golf tournament*. Presented at 2012 KAHPERD Convention, Louisville, KY.

Naeger, D. J., & **Kang, S. J.** (2012, November,). *Implementing technology into physical education curriculum*. Presented at 2012 KAHPERD Convention, Louisville, KY.

Kang, S. J., Ha, J. P., Hambrick, M. E., & Greenwell, T. C. (2012, October). *A conceptual model for sport-related mobile applications*. Presented at the SMA 2012 conference, Orlando, FL.

Itoh, M., **Kang, S. J.,** & Hums, M. A. (2012, October). *Exploring Nadeshiko league's online marketing effort*. Accepted for presentation at the SMA 2012 conference, Orlando, FL.

Choi, C., **Kang, S. J.,** Itoh, M., & Lee, C. H. (2012, May) *Exploring students' motivation and commitment to sport management major*. Presented at the NASSM 2012 conference, Seattle, WA.

Kang, S. J., Ha, J. P., & Hambrick, M. E. (2012, May) *Exploring the motivations of sport-related mobile applications among college students*. Presented at the NASSM 2012 conference, Seattle, WA.

Dittmore, S., **Kang, S. J.,** & Hambrick, M. E. (2012, April) *How college athletic leaders communicate: Framing athletic director Tweets*. Presented at the annual College Sport Research Institute conference, Raleigh, NC.

Kang, S. J., & Hambrick, M. E. (2012, March) *Exploring sport consumers' emotional attachment level to mobile devices*. Presented at the Graduate Research Symposium, Louisville, KY.

Kang, S. J., Ha, J. P., & Hambrick, M. E. (2012, March) *Using mixed-method approach to explore the motivations of sport-related mobile applications among college students*. Presented at 2012 Spring Research Conference, Louisville, KY.

Kang, S. J., & Workman, G. (2011, October). *Content analysis of PGA and LPGA Grand SlamTournaments' Websites*. Presented at the annual Sport Marketing Association conference, Houston, TX.

Scholarly Work in Progress

Kang, S. J., Rice, J. A., & Hambrick, M. E. (in review). Overcoming niche sport disadvantages with social media. Submitted to *International Journal of Sport Marketing and Sponsorship*.

Kang, S. J. & Ha, J. P. Are wearable technologies the wave of the future for sport businesses? To be submitted to *Communication & Sport*.

Kang, S. J., Itoh, M., & Choi, N. Comparing smart sport fans across U.S. and Japan. To be submitted to *International Journal of Sport Management*

Ha, J. P., Kim, Y. K., & **Kang, S. J.** Sport consumers in a 'Smart sport' (SS) age: Smartphone and Sport. To be submitted to *Journal of Sport Management*.

Choi, C., **Kang, S. J.**, Itoh, M., & Lee, C. H. Exploring students' motivation and commitment to sport management major. To be submitted to *Sport Management Education Journal*.

Book Chapters

Hambrick, M. E., & Kang, S. J. (2013). Governance of individual sports. In Hums, M. A., & McLean, J. C., *Governance and Policy in Sport Organizations* (3rd ed.). Scottsdale, AR: Halcomb Hathaway.

Research Grants and Funding Activities

Kang, S. J. Student research grant proposal accepted to the Graduate Student Council, University of Louisville in the amount of \$300

Kang, S. J. Travel to Philadelphia, PA for the 2014 Sport Marketing

Association (SMA) Conference. Funded by the Graduate Student Council, and Sport Administration Club, University of Louisville in the amount of \$350

Kang, S. J. Travel to Pittsburg, PA for the 2014 North American Society for Sport Management (NASSM) Conference. Funded by the Department of Health and Sport Sciences, University of Louisville in the amount of \$150 and Graduate Student Council, University of Louisville in the amount of \$200

Kang, S. J. Travel to Albuquerque, NM for the 2013 Sport Marketing Association (SMA) Conference. Funded by the Graduate Student Council and Sport Administration Club, University of Louisville in the amount of \$450

Kang, S. J. Travel to Austin, TX for the 2013 North American Society for Sport Management (NASSM) Conference. Funded by the Department of Health and Sport Sciences, University of Louisville in the amount of \$300

Kang, S. J. Travel to Orlando, FL for the 2012 SMA Conference. Funded by the Graduate Student Council, University of Louisville in the amount of \$250

Kang, S. J. Travel to Seattle, WA for the 2012 NASSM Conference. Funded by the College of Education and Human Development, University of Louisville in the amount of \$200

Kang, S. J. Travel to Houston, TX for the 2011 SMA Conference. Funded by the Graduate Student Council, University of Louisville in the amount of \$200

SERVICE

<i>Journal of Sport</i> Journal reviewer	2013 - Present
Sport Administration Club (University of Louisville) Member	2013 – Present
North American Society for Sport Management Member	2012 – Present
Sport Marketing Association Member	2011 – Present

Korean American Association of Kentuckiana Secretary	2013 - 2014
Graduate Student Association (University of Louisville) Student Representative for Sport Administration	2012 – 2014
Korean Student Association (University of Louisville) Treasurer	2012 – 2014
Spring Research Conference 2012 Student volunteer	
Barry University Sport Management Association Member	2009 – 2011
Barry University 2011-2016 Strategic Planning Steering Committee Student Representative	2011

HONORS AND AWARD

Selected recipient of the Health and Sport Sciences Student Development Award from Department of Health & Sport Sciences, University of Louisville	Fall 2015
Selected recipient of the Doctoral Dissertation Completion Award from School of Interdisciplinary and Graduate Studies, University of Louisville	Spring 2015
Selected recipient of the Samuels family scholarship from College of Education and Human Development, University of Louisville	Fall 2014
Selected nominee for the Dissertation Writing Camp, Three-weekend intensive writing program sponsored by College of Education and Human Development, University of Louisville	Spring 2014
Selected nominee for the Graduate Teaching Academy, University-wide year-long intensive teaching program, sponsored by School of Interdisciplinary and Graduate Studies, University of Louisville	2013 – 2014

Selected nominee for the Dissertation Writing Retreat, Spring 2014
 five-day intensive writing program sponsored by School of
 Interdisciplinary and Graduate Studies,
 University of Louisville

Recipient of the Outstanding Graduate Student Award from Fall 2011
 Andrea School of Business,
 Barry University

Recipient of Graduate Scholarship from Department of 2009 - 2011
 Human Performance and Leisure Sciences,
 Barry University

ACTIVITIES

Volunteer

- Louisville Professional Tennis Invitational Nov. 2014
- Kentucky Derby Festival Marathon and miniMarathon May 2014
- CelebrAsia Dragon Boat Race May – Sept. 2014
- Louisville Korean Day Sport Festival
Aug. 2012, 2013
- Korean School of Louisville
Jan. 2014 – Dec. 2014
- McDonald Charity Golf Tournament
May 2010
- Make a Wish Charity dinner event
April 2010
- Super Bowl XLIV
Sept. 2009
- Special Olympics
Sept. 2009
- PGA WGC-CA Championship
March 2009
- Buick Invitation Jan. 2007, Jan. 2008
- U.S. Open
June 2008

Sport Club Membership

- Member, Korean Professional Golf Association 2005 – Present
- Member, Southern California Kendo Federation 1990 – Present