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AN INVESTIGATION OF VIRTUAL GOLF IN THE REPUBLIC OF KOREA
FROM A MARKETING PERSPECTIVE

By

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B.A., Kyunghee University, 2007
M.A., State University of New York at Cortland, 2010

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 2016

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ABSTRACT

AN INVESTIGATION OF VIRTUAL GOLF IN THE REPUBLIC OF KOREA

FROM A MARKETING PERSPECTIVE

Chulhwan Choi

April 22, 2016

Just as advances in technology have drastically changed daily life, the entire sport business industry has been altered by the latest technology (Lee, Cheon, Judge, Shin, & Kim, 2012). A virtual sport, called "screen golf", has offered a virtual reality via simulators and has seen enormous growth in the Republic of Korea (Kim, Seo, Kim, & Chang, 2014), not just as an alternative to the existing sport but as an entirely new type of sport entertainment (Han, Beak, Lee, & Huh, 2014). Knowing that there are significant gaps in consumer behaviors between existing sports and emerging sports (Ko, Park, & Claussen, 2008), investigating consumers' decision-making processes for participation in virtual golf is essential for the sport to be successful in this new market.

As new trends of enjoying sports, like sport-related online games (Hur, Ko, & Valacich, 2007; Seo & Green, 2008) and video games (Kim, Walsh, & Ross, 2008), have emerged, and efforts to understand changing consumer behaviors have continued, it is necessary to explore virtual sports, which have had little attention so far, from diverse marketing perspectives. Hence, the primary purposes of this study were to (a) investigate differences in constraints between participation in actual golf and virtual golf, (b) compare constraints between experienced and non-experienced individuals in virtual golf,

(c) examine effects of household income on constraints in virtual golf, (d) investigate effects of mastery on constraints in virtual golf, and (e) explore relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions in virtual golf.

A total of 389 surveys were collected from five virtual golf centers and two actual golf clubs in Korea using an intercept data collection technique. The result of this study revealed significant constraints differences on four constraints (cost, weather, time, and skill/confidence) between participating in actual and virtual golf. Next, the effects of personal golf experiences had significant influence on four constraints (social, cost, time, and skill/confidence) when participating in virtual golf. Furthermore, the low income group was more constrained by four constraints (social, cost, time, and skill/confidence), and the low mastery group was limited in their participation in virtual golf by two constraints (cost and skill/confidence). Lastly, all the given factors (core service, perceived value, consumer satisfaction, and behavior intentions) except peripheral service were significantly related each other.

The current study provided a comprehensive insight into consumer behaviors in virtual golf from diverse marketing perspectives. In particular, this study investigated an individual's entire decision-making process in leisure participation and offered more detailed information to service providers and researchers through application of diverse variables. Consequently, the findings of this study contribute to future research regarding technology-driven sport industries striving to attract potential consumers and could expand literature on consumer behavior, including leisure constraints, service quality, perceived value, consumer satisfaction, and behavioral intentions.

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CHAPTER I

INTRODUCTION

Rapid technological developments have changed fantasy into reality, and computer-based environments have enabled people to experience virtual reality, which might be more realistic than real life (Lee et al., 2012). In the sport industry, advanced technology has not only brought about dramatic changes in consumption patterns, but also has generated new types of sports (Young & Pederson, 2010). Among other technology-applied sports, indoor virtual golf, also called "screen golf," has experienced outstanding growth in the Republic of Korea (Jung, Park, Kang, Lee, & Hahn, 2010; Kim et al., 2014; Lee, Chung, & Lee, 2013). The virtual golf system offers a virtual reality through screens, sensors, and simulators (Jung et al., 2010). The virtual reality created by a virtual golf simulator has attracted consumers (Choe, 2008), and the popularity of virtual golf has threatened that of actual golf (Han et al., 2014). In the Republic of Korea, a leading market for virtual golf, one can find approximately 7,800 virtual golf centers with over 15,000 virtual simulator systems, and more than 1.37 million annual virtual golf customers. The total gross revenue for the business exceeds US\$1 billion (Chung, 2010).

By recreating globally recognized golf courses such as the Old Course at St. Andrews or Augusta National Golf Club through downloaded aerial images, virtual golf has freed golfers from restrictions in terms of time, weather, and location (Kim et al, 2014). However, the technological advancements of virtual golf might limit golfers

from playing the sport outside in nature. Thus, research on leisure constraints of virtual golf would provide a significant opportunity to explore diverse factors that limit participation (Samdahl & Jekubovich, 1997) in virtual golf and understand rapidly changing consumer behaviors (Jackson, 1990a; Jackson, 1990b). Hence, the current study investigated the participation constraints in virtual golf through comparisons based on types of golf (i.e., virtual golf vs. actual golf) and personal golf experiences in virtual golf (experienced vs. non-experienced).

In the Republic of Korea, it is expensive (e.g., high green fee) to enjoy golf because the government charges the golf industry a high tax rate (Achenbach, 2011; Choe, 2008). Thus, the lower cost of virtual golf compared to actual golf might create a competitive advantage for virtual golf from a marketing standpoint. The financial burden might take beginning golfers away from actual golf as a leisure sport in the Republic of Korea, especially considering the fact that virtual golf was invented to encourage novices to enjoy golf without any financial concerns (Choe, 2008). Previous literature (Petrick, Backman, & Bixler, 1999) noted that perceived value (i.e., rate or fare) played a vital role in consumers' perceptions, meaning there could be potential room for growth of virtual golf. In addition to the financial aspect, mastery was another significant determinant in golf participation in that more skilled golfers would be less likely to be satisfied due to differences of expectations and golfing experiences (Zhang, 2007). Knowing consumers' subjective perceptions of leisure participation may be determined by distinct personal characteristics, certain variables (i.e., household income and mastery) should be considered significant factors in investigating their behaviors (Oliver, 1980; Williams, 1989). Thus, influences of significant selected variables (i.e., household income and

mastery) on participation constraints in virtual golf were examined.

Lastly, researchers need to be aware that virtual golf should be considered as a sport-based business. Specifically, given that virtual golf offers technology-based services for golfers (Lee et al., 2013), it could be considered a business operating in the service industry. Investigating significant factors (service quality, perceived value, consumer satisfaction, and behavioral intentions) is vital for successful businesses in a service industry (Yu, Zhang, Kim, Chen, Henderson, Min, & Huang, 2014). Previous literature found that service quality, perceived value, and consumer satisfaction were important factors (Berry, Zeithaml, & Parasuraman, 1990; Bitner & Hubbert, 1994; Cronin, Brady, & Hult, 2000; Fornell, 1992; Howat, Crilley, Milne, & Absher, 1993; McDougall & Levesque, 2000; Murray & Howat, 2002; Ko & Pastore, 2004; Yiannakis, 1989). Favorable consumer satisfaction with high quality and reasonable price (perceived value) would be essential in forming better relationships and retaining consumers (Backman & Crompton, 1989; Shukla, 2010). However, given the significant gaps between existing sports and emerging sports (Ko et al., 2008), more investigation is needed on consumer behaviors in virtual golf to provide better customer experiences. Therefore, examining relationships among factors (e.g., service quality, perceived value, consumer satisfaction, and behavioral intentions) is necessary in order to understand consumer behavior in virtual golf.

Statement of the Problem

Considering actual golf can be influenced by location, time, and weather (Han, 2004; Petrick et al., 2001; Zhang, 2007), virtual golf, which eliminates many limitations, may be the best option for avid golfers. In other words, the reason “Screen Golf” became

one of the most popular sport-related businesses in the Republic of Korea was to satisfy desires of avid golfers who experienced limitations in playing actual golf. However, considering that the fundamental purpose of golf is to enjoy playing the sport while surrounded by nature, virtual golf also might fail to attract actual golfers. Thus, exploring constraints of virtual and actual golf provides a significant opportunity to develop the overall golf industry, not only in the Republic of Korea, but in other countries as well.

Furthermore, from a marketing perspective, efforts to examine significant factors (i.e., service quality, perceived value, and consumer satisfaction) affecting consumers' behavioral intentions are necessary for successful sport-related business (Yu et al., 2014). Specifically, consumer satisfaction (Murray & Howat, 2002; Howat, Murray, & Crilley, 1999; McDougall & Levesque, 2000; Yu, et al., 2014) and service quality (Berry et al., 1990; Bitner & Hubbert, 1994; Howat et al., 1993; Ko & Pastore, 2004; Yiannakis, 1989) have been considered significant elements. Also, the influence of perceived value on consumer behaviors gained attention in the sports industry as a mediator between service quality and consumer satisfaction (Cronin et al., 2000; McDougall & Levesque, 2000; Murray & Howat, 2002; Petrick et al., 1999; Shukla, 2010; Yu et al., 2014; Zeithaml, 1988). In this sense, an investigation of relationships among the significant factors could be essential for research on virtual golf.

Even though previous studies found both specific and unique sport consumer behaviors, results were limited in that researchers focused strictly on recreational golf (Han, 2004; Petrick et al., 2001; Zhang, 2007), leisure constraints of dominant sport environments (Alexandris, Tsorbatzoudis, & Grouis, 2002; Crawford, Jackson, & Godbey, 1991; Henderson, 1997), online sports (Hur et al., 2007; Seo & Green, 2008), and sport-

related video games (Kim et al., 2008). However, given the significant differences between existing sports and emerging sports (Ko et al., 2008), more studies are needed to better understand virtual sports consumers. Nevertheless, there have been few investigations in virtual golf focusing on technological aspects (Jung et al., 2010; Kim et al., 2014) and social aspects (Lee et al., 2013).

Accordingly, the current research focused on investigating participation constraints in virtual golf and examined relationships among factors (service quality, perceived value, and consumer satisfaction) in virtual golf in the Republic of Korea. This study can be an important step in examining a virtual sport that could become a significant sport market for the future.

Demographics and Golfographics

From a fundamental marketing perspective, knowing that each individual's consumer behavior might vary and personal consumption experience may be subjective (Petrick et al., 1999), consumer segmentation based on characteristics might be necessary to understand target consumers. In the same manner, knowing that different individuals might have different perceptions about sport-related consumption, research using consumer segmentation in the sport industry can be significant as well (Greenwell, Fink, & Pastore, 2002b).

Given that demographic variables greatly impact perceptions of sport-related service experience even under identical conditions, paying attention to consumer segmentation may enable service providers to offer better experiences for sport consumers (Greenwell et al., 2002b). Indicating little attention to demographic variables in leisure participation research, Petrick et al. (1999) argued that personal experience and

evaluation regarding consumer behaviors may be quite distinct from individual to individual. Specifically, they noted the relationship of selected demographic factors (e.g., household income) to leisure participation. Furthermore, distinctive “golfographic” variables (e.g., mastery and frequency of playing golf) could also be considered significant (Zhang, 2007). Given that golfers' subjective perceptions of leisure participation may be determined by distinct personal characteristics, golfographic variables (i.e., mastery) should not be overlooked (Oliver, 1980; Williams, 1989). Based on the fact that consumers' subjective perceptions or evaluation of leisure participation could be determined by relative comparison with their personal characteristics, investigations applying demographic variables (e.g., age, gender, marital status, and household income) and golfographic variables (e.g., mastery and frequency of playing) are essential (Oliver, 1980; Williams, 1989) to determine golfers' perceptions on leisure participation.

Leisure Constraints

Leisure constraints research has focused on exploring various factors that might limit leisure participation (Samdahl & Jekubovich, 1997), understanding rapidly changing leisure preferences (Jackson, 1990a), and exploring variations in leisure choices (Jackson, 1990b). Initial research on leisure constraints emphasized the importance of individual, social, and psychological factors in understanding leisure constraints, indicating the fact that people are social animals (Iso-Ahola, 1981; Iso-Ahola & Mannell, 1985).

Crawford and Godbey (1987) proposed three types of constraints (e.g., intrapersonal barriers, interpersonal barriers, and structural barriers) and Crawford et al.

(1991) modified them into a sequential hierarchical model because the decision making process was not systematically ordered (Tsai & Coleman, 2009). Later, where previous research focused on leisure constraints causing individuals' nonparticipation, Crawford et al. (1991) suggested that leisure constraints were not necessary considered insurmountable limitations, but a negotiable concept, influencing an individual's decision even after participation (Jackson, Crawford, & Godbey, 1993). Until recently, leisure constraints have been discussed as negotiable factors in individuals' decision making processes (Alexandris & Carroll, 1997; Hawkins, Peng, Hsieh, & Ekiund, 1999; Hubbard & Mannell, 2001; Jackson & Dunn, 1991; Jackson & Rucks, 1993). In other words, when encountering a constraint, an individual might negotiate the constraint in various ways, subsequently leading to participation or nonparticipation (Crawford & Godbey, 1987; Crawford et al., 1991; Jackson et al., 1993; Scott, 1991).

In this way, leisure constraint research has continuously evolved through theoretical development (Jun & Kyle, 2011a, 2011b; Jun, Kyle, & Mowen, 2009; Lyu & Oh, 2014; Lyu, Oh, & Lee, 2013; White, 2008) in spite of definitional (Crawford et al., 1991; Crawford & Godbey, 1987; Jackson, 1991), conceptual (Henderson, 1997), and methodological concerns (Allender, Cowburn, & Foster, 2006; Henderson, Stalnaker, & Taylor, 1988; Jackson & Dunn, 1988). Based on theoretical development, previous research (Murray & Howat, 2002; Yu et al., 2014) found that various leisure constraints limited individuals' leisure participation. However, this investigation of virtual golf from a marketing perspective is significant because of the uniqueness of consumer behaviors, which might vary in numerous instances.

Service Quality

Understanding service quality is significant to sport marketers in that the construct plays an important role in profitability of sports facilities (Yiannakis, 1989). Specifically, service quality is the most essential element in satisfying consumers, retaining individuals and enhancing a consumer base (Yu et al., 2014). Furthermore, considering that several factors in terms of consumer behavior (e.g., service quality, perceived value, consumer satisfaction, and behavioral intentions) are correlated with each other, it is necessary to investigate them all in order to offer a better service environment (Murray & Howat, 2002).

Given that people expect improved service quality in changing society (Berry et al., 1990; Ko & Pastore, 2004), investigating service quality, defined as overall subjective impression after consumption (Bitner & Hubbert, 1994), is important for consumers, researchers, and marketers (Howat et al., 1993). Based on the fact that diverse consumers' tastes might exist in various service environments, research on service quality should be able to understand unpredictability and diversity of consumer evaluation. The methodological approaches to the study of service quality have progressed with supplementation and modification (Brady & Cronin, 2001; Ko & Pastore, 2004, 2005; Parasuraman, Berry, & Zeithaml, 1991; Parasuraman, Zeithaml, & Berry, 1985, 1988; Yildiz & Kara, 2012). New methodological attempts (Lam, Zhang, & Jensen, 2005; Rial, Varela, Rial, & Real, 2010; Yildiz & Kara, 2012; Young & Pedersen, 2010; Yosuke, Bennett, & James, 2007) have also been developed in order to understand consumers' perceptions of service quality.

Perceived Value

To understand consumer behaviors, it is necessary to consider various factors that influence individuals' behavioral intentions. Above all, one specific factor, perceived value, garners a great deal of attention in sport-related service industries (Cronin et al., 2000; McDougall & Levesque, 2000; Murray & Howat, 2002; Petrick et al, 1999; Shukla, 2010; Yu et al., 2014; Zeithaml, 1988). Given that perceived value has been described as price or cost of a product or service, the extent of perceived value can be measured by the difference between cost and benefit (McDougall & Levesque, 2000; Yu et al., 2014). From conceptual perspectives, when interpreted as a mediator between service quality and consumer satisfaction, perceived value potentially greatly affects a consumer's future intention (McDougall & Levesque, 2000; Murray & Howat, 2002). More specifically, considering that disappointments about lower service quality compared with consumers' expectations could be adjusted by positive influence via perceived value, it would be a significant marketing resource.

In this study, perceived value is a crucial factor to satisfy virtual golf consumers. Considering golfers playing on outdoor courses in the Republic of Korea pay relatively high costs (green fees) in accordance with government policy (Achenbach, 2011; Choe, 2008), perceived value may play a greater role in choosing to play virtual golf. This study is necessary to explore how perceived value plays a vital role between service quality and consumer satisfaction.

Consumer Satisfaction

According to Fornell (1992), "loyal customers are not necessarily satisfied customers but satisfied customers tend to be loyal customers" (p. 7), arguing the

connection between consumer satisfaction and behavioral intentions. Consumer satisfaction was defined as "an overall postpurchase evaluation" (Fornell, 1992, p.11). Previous research on consumer satisfaction (Murray & Howat, 2002; Howat et al., 1999; McDougall & Levesque, 2000; Yu, et al., 2014) indicated that satisfaction was a consequence of service quality, and a cause of consumer behavioral intentions that affected profitability. The current study explored consumer satisfaction with virtual golf in combination with other factors (i.e., service quality, perceived value, and behavioral intentions) in order to offer a better leisure environment for an emerging sport business.

A wide variety of research (Anderson, 1973; Cardozo, 1965; Caro & Garcia, 2007; Churchill & Surprenant, 1982; Cohen & Goldberg, 1970; Fornell, 1992; Giese & Cote, 2002; Kim et al., 2014; Oliver, 1980,1981; Olshavsky & Miller, 1972; Olson & Dover, 1979; Swan & Combs, 1976; Theodorakis, Alexandris, Rodriguez, & Sarmento, 2004; Tse & Wilton, 1988; Young & Pedersen, 2010) about consumer satisfaction has been conducted using differing theoretical approaches, and the efforts have contributed to understanding consumers' decision-making processes. Therefore, based on the findings of those previous studies, this current study provided information about how consumer satisfaction could be achieved within the leisure participation decision making process in virtual golf.

Behavioral Intentions

Even if research for providing a better service environment to consumers has been conducted and constructive criticisms offered (Asubonteng & McCleary, 1996; Buttle, 1996; Cronin & Taylor, 1992, 1994; Parasuraman et al., 1991; Yildiz & Kara, 2012), a manager's ultimate purpose would be to satisfy consumers through high service quality

and reasonable cost (perceived value). Considering the fact that attracting new consumers is much harder than maintaining existing consumers (Shukla, 2010), efforts to understand future behavioral intentions would be significant in forming relationships with existing consumers to facilitate their retention (Backman & Crompton, 1989). By investigating relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions, this current study provided better understanding of behavioral intentions in virtual golf.

Purpose of the Study

Given that constraints on leisure activities influence individuals' decisions to participate in an activity (Crawford et al., 1991), it is essential to study these leisure constraints. Because virtual golf is a newly emerging sport-related business, eliminating factors (constraints) that might limit participation may shed light on creating more opportunities for participation. Also, considering that virtual golf is a participation sport and consumers themselves are the most important asset for a successful business, investigating relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions would be significant as well. In other words, providing consumers with high quality and reasonable pricing (perceived value) would be the best ways to form better relationships with consumers and potentially facilitate their retention (Backman & Crompton, 1989; Shukla, 2010).

Accordingly, the primary purposes of this study were to (a) investigate differences in constraints between participation in actual golf and virtual golf, (b) compare constraints between experienced and non-experienced individuals in virtual golf, (c) examine effects of household income on constraints in virtual golf, (d) investigate effects

of mastery on constraints in virtual golf, and (e) explore relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions in virtual golf.

Research Questions

RQ1: What are the differences in constraints between participation in actual golf and virtual golf?

RQ2: Which constraints differ between experienced and non-experienced golfers participating in virtual golf?

RQ3: Which constraints differ among household income levels (high, medium, and low) in participating in virtual golf?

RQ4: Which constraints differ among mastery levels (master, advanced, intermediate, and beginner) in participating in virtual golf?

RQ5: What are the structural relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions in virtual golf?

Significance of the Study

Advanced technology has not only brought about dramatic changes in the consumption patterns of the sport industry, but also has generated new types of sports (Young & Pederson, 2010). In that sense, there are significant reasons for the current study: (a) to offer a better service environment to consumers in virtual golf, which might be totally different from the existing sport (actual golf), (b) to maintain existing consumers and to attract potential consumers of virtual golf, which is a participation sport where consumers might be the most important asset, (c) to contribute to future research focusing on technology-driven sports, and (d) to expand literature on leisure constraints, service quality, perceived value, consumer satisfaction, and behavioral intentions.

As a social phenomenon, virtual golf has shown impressive growth in the Republic of Korea (Jung et al., 2010; Kim et al., 2014). Considering the fact that the number of virtual golf consumers is greater than the number of actual golf consumers (Lee et al., 2013) and that there were significant differences between existing sports genres and emerging sports (Ko et al., 2008), this study was necessary to understand consumer behavior and to offer a better service environment to consumers in the emerging sport. The results of this study provide great sport marketing resources to look at the emerging sport of virtual golf as a way of expanding participation and increasing revenues for golf facilities (Kim, Andrew, & Greenwell, 2009; Shank, 1998). Furthermore, only a few studies have examined virtual golf (Jung et al., 2010; Kim et al., 2014; Lee et al., 2013) in spite of its enormous potential. Given that the ultimate marketing goal of participation sports (i.e., virtual golf) is to increase participation numbers and attract and retain potential consumers, investigating consumer behaviors was an appropriate approach from a broad perspective.

According to Shukla (2010), attracting new consumers was six times more costly than maintaining existing consumers. As a newly emerging sport-related business, virtual golf needs to continually attract potential consumers not as an alternative to actual golf, but as an independent sport-related genre. To encourage people to participate in virtual golf, examining individuals' constraints can be vital in eliminating various factors that might limit participation. Based on the fact that the decision-making process for participation is not systematically ordered (Tsai & Coleman, 2009) but is influenced by external factors (Henderson, 1997), the current study provides more detailed information of constraints in virtual golf, and contributes to helping service providers expand their

consumer base. The comparative approaches to leisure constraints using groups based on golf experience and types of golf (virtual and outdoors) will offer marketing strategies that could help develop the overall golf industry. This research also contributes to discovering how golf facility managers can form stronger relationships with existing virtual golf consumers to facilitate their retention (Backman & Crompton, 1989).

Moreover, the current study provides theoretical contributions for the study of virtual sports. Given that previous literature on leisure constraints focused on dominant sports (Alexandris et al., 2002; Hur et al., 2007; Petrick et al., 2001; Seo & Green, 2008; Zhang, 2007), the theoretical approach of this study contributes to future research investigating different types of virtual sports. Specifically, the participation constraints in virtual golf could be applied to various technology-driven sports striving to attract potential consumers. Also, this research will expand literature on service quality, perceived value, consumer satisfaction, and behavioral intentions. Although previous researchers (Murray & Howat, 2002; Yu et al., 2014) focused on consumer behaviors from various perspectives, this research contributes to providing specific insight into virtual sports.

Delimitations

Delimitations are controllable characteristics of research (e.g., study purpose, research questions, variables, theoretical standpoints, and target population). Researchers determine delimitations in order to establish the boundaries of the research (Simon, 2011). Accordingly, there are several delimitations within the current study.

a. To investigate consumer behaviors of virtual golf, this study chose leisure constraints, service quality, perceived value, consumer satisfaction, and behavioral

intentions. Given that previous researchers applied motivation (Alexandris, Funk, & Pritchard, 2011; Hubbard & Mannell, 2001; Jun et al., 2009; White, 2008), identification (Kwon, Trail, & James, 2007; Yoshida, James, & Cronin, 2013), and negotiation (Hubbard & Mannell, 2001; Jun & Kyle, 2011, 2011b; Loucks-Atkinson & Mannell, 2007; Lyu et al., 2013), this study might not measure entire spectrum of consumer behavior.

b. This study focused on investigating virtual golf. Actual golf is highly vulnerable to severe weather and high cost so virtual golf is an alternative for many consumers. Thus, it could contribute to an understanding of virtual golf not only as an alternative to actual golf, but also as an independent sport genre from a marketing perspective. But, given that various types of virtual sports exist and their characteristics differ, the findings of this study might not be generalizable to those other sports.

c. In the data collection procedure, this study implemented a survey with individuals in the Republic of Korea because virtual golf has such outstanding popularity that it has threatened the actual golf industry in that country (Choe, 2008). This research will provide more detailed and rich information about the consumer behavior of virtual golf participants from the Republic of Korea. However, considering that the Korean golf industry has unique characteristics from a cultural aspect, the findings of this study might not be generalizable to other countries.

Limitations

Limitations are uncontrollable study weaknesses relevant to sampling procedures or a restricted research period. There are several limitations within the current study.

a. This study included intercept data collection technique to sample individuals

who have awareness about actual golf and virtual golf in the Republic of Korea. However, some researchers have been concerned about the representativeness of results from the intercept survey technique because all potential respondents might not have an equal chance of participating in the study (Creswell, 2008). Nevertheless, the intercept data collection technique was used due to participant availability and convenience. Thus, it might not be generalizable to the larger population.

b. This study utilized survey questionnaires that were back translated to check to ensure the survey translations were adequate. All procedures were reviewed with translators who were proficient in the target language (Korean) and the source language (English). However, unavoidable distinctions between the two languages might exist.

c. This study applied survey dimensions of leisure constraints from Jun and Kyle (2011a). After performing two exploratory factor analyses, the dimensions contained six sub-dimensions: (a) social, (b) health, (c) skill/confidence, (d) cost, (e) weather, and (f) time. However, in spite of the reconstructed factor structure fitting into this study, considering the fact that Jun and Kyle (2011a) developed the survey scales to investigate only actual golf, focusing on both actual and virtual golf might be a methodological limitation of this study.

d. This study explored the effects of selected factors (household income and mastery) on leisure constraints in virtual golf using a series of Multivariate Analysis of Variance (MANOVA). The respondents were classified into three categories on household income (high, middle, and low) and four categories on mastery (beginner, intermediate, advanced, and master). These artificially categorized groups based on self-reported information might also have limitations from a methodological perspective.

e. In the second research question, to examine the constraint differences based on the existence and nonexistence of experience in virtual golf, participants were divided into two groups (experienced vs. non-experienced in virtual golf). In the fourth and fifth questions, to analyze consumer behaviors in virtual golf, experienced golfers in virtual golf were selected. However, their experiences in actual golf, which might affect consumer behaviors in virtual golf, were not considered.

Definitions

Virtual golf: Indoor golf, which is called "screen golf" in the Republic of Korea; "Screen golf is a system that offers users a realistic experience of playing golf on a real course in virtual reality. Players use real clubs and balls and when a player hits the ball in front of a large projected screen, the system calculates the speed of the club head, the angle of the club face, the spinning speed, direction, distance and the speed of the ball and displays realistic visuals of the landscape, slope, fairway, rough and sand bunker" (Kim et al., 2014, p.26).

Experience of actual and virtual golf: Participants in this study were individuals who have experience playing actual golf and/or virtual golf in the Republic of Korea.

Golfographic variables: Statistical data of a golfer, especially, showing mastery, frequency of playing, years of play, and golf membership (Oliver, 1980; Petrick et al., 1999; Williams, 1989; Yun, MacDonald, & Hennessey, 2010; Zhang, 2007).

Leisure constraints: Factors "which affect individuals' formation of leisure preferences for particular activities and limit their ability to participate in the activities" (Lyu & OH, 2014, p.480). Leisure constraint was classified and defined as follows (Crawford & Godbey, 1987):

a) Intrapersonal barriers refer to "individual psychological states and attributes which interact with leisure preferences rather than intervening between preferences and participation" (p.122).

b) Interpersonal barriers refer to "the result of interpersonal interaction or the relationship between individuals' characteristics" (p. 123).

c) Structural barriers refer to common constraints "intervening factors between leisure preference and participation" (p.124) (e.g., financial resources, lifestyle, season, climate, and work time).

Leisure constraint negotiation: A process of minimizing the impact of leisure constraints on individuals' leisure participation decision (Jackson et al., 1993).

Service Quality: A overall subjective perception after consumption (Bitner & Hubbert, 1994).

Perceived Value: "The consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given" (Zeithaml, 1988, p.14) or "benefits received relative to costs" (McDougall & Levesque, 2000, p.393).

Consumer Satisfaction: An overall perception of the service compared to consumers' expectations (Murray & Howat, 2002).

Behavioral Intentions: The likelihood a consumer will play virtual golf in the future (Filo, Funk, & O'Brien, 2010)

CHAPTER II

LITERATURE REVIEW

As a social phenomenon, virtual golf offers a virtual reality with screens, sensors, and simulators and has seen enormous growth in the Republic of Korea (Han et al., 2014). Virtual golfers use real golf clubs, balls, and their own swings in front of a projector screen (Kim et al., 2014; Lee et al., 2012). By recreating global golf courses through downloaded aerial images, virtual golf has freed golfers from restrictions in terms of time, weather, and location (Kim et al, 2014). In the Republic of Korea, a leading market of virtual golf, there were approximately 7,800 virtual golf centers with over 15,000 virtual simulator systems, more than 1.37 million of annual virtual golf customers, and a total gross of the business exceeding US\$1 billion (Chung, 2010).

The primary purposes of this study were a) to investigate differences of golfers' constraints between participation in actual golf and virtual golf, b) to compare constraints between experienced and non-experienced individuals in virtual golf, c) to examine effects of household income on constraints in virtual golf, d) to investigate effects of mastery on constraints in virtual golf, and (e) to explore relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions in virtual golf. This study was a chance to look at a virtual sport, a potentially remarkable sport-related business market for the next generation. Given the few studies focusing virtual golf (Jung et al., 2010; Kim et al., 2014; Lee et al., 2013), this study provided an opportunity to understand virtual sport by comparing constraints in the two contexts (golf and virtual

golf) and to investigate constraints of non-experienced potential consumers. Based on the importance of demographics (household income) (Greenwell et al., 2002b) and a golfographic variable (mastery) (Petrick et al., 1999; Zhang, 2007) in consumer behaviors, the selected factors (household income and mastery) of consumers in virtual golf were applied in this study. Lastly, this study explored influences of three constructs - service quality, perceived value, and consumer satisfaction on behavioral intentions to gain a better insight of consumer decision making process in virtual golf.

Virtual golf has received little attention from a marketing perspective. To have a comprehensive understanding of virtual golf, it was necessary to explore an individual's behavior before, during, and after participating (Iso-Ahola & Mannell, 1985). In that sense, to investigate behaviors before participation, comparisons on leisure constraints were conducted based on two contexts (golf and virtual golf), the existence of experience (experience and non-experience) in virtual golf, and the selected factors (household income and mastery). In addition, to analyze behaviors during and after participation, the relationships of service quality, perceived value, consumer satisfaction, and behavioral intentions were examined. In the first section of this chapter, the need for research in a newly emerging market in sport industry and the importance of the selected factors (demographic and golfographic variables) in sport-related activities was discussed. In the following section, a literature review of consumer participation constraints was provided. The last section examined significant constructs of consumer behaviors (e.g., service quality, perceived value, consumer satisfaction, and behavioral intentions).

A Newly Emerging Market in the Sport Industry

Even though previous studies found specific and unique sport consumer behaviors,

they were limited in that researchers have focused on leisure golf (Lim & Park, 2004; Petrick et al., 2001; Richard & Faircloth, 1994), leisure constraints of dominant sport environments (Alexandris et al., 2011; Carroll & Alexandris, 1997; Jackson & Rucks, 1995), online sports (Hur et al., 2007; Seo & Green, 2008), and sport-related video games (Kim et al., 2008; Walsh, Kim, & Ross, 2008). However, given the fact that there were significant differences between the existing sports genres and the emerging sports (Ko et al., 2008), more studies were needed to better understand participation constraints in virtual golf.

With the continuously growing popularity of sports and the development of technology, various sports industries and sport consumption behaviors have changed rapidly all over the world. Given the fact electronic sports, well known as eSports or video games, have expanded as a significant sport industry segment (Lee et al., 2012), many researchers and marketers have investigated the influences of this new emerging trend. Considering most sport organizations (e.g., NFL, FIFA, NASCAR and PGA) have provided video games of their sports, there was no question that the electronic sport market was an emerging business overcoming limitations of traditional sport settings (Lee & Schoenstedt, 2011). “Screen Golf” has shown an outstanding growth rate in the Republic of Korea (Jung et al., 2010; Kim et al., 2014). Based on virtual reality through a high definition golf simulator, a sensor, and a computer graphics engine (Jung et al., 2010), virtual sport has threatened the actual sports industry. Given the fact that the consumer population of virtual golf has outnumbered that of actual golf in the Republic of Korea (Choe, 2008), it was necessary to look at this emerging sport as a way to expand fan bases and increase revenues (Kim et al., 2009; Shank, 1998).

Even with its recent popularity, however, few investigations on virtual golf have been implemented from various perspectives. When it comes to its technological aspect, Jung et al. (2010) investigated sensors applied to the virtual golf simulator for better virtual reality. Results recommended proposed camera-based virtual golf sensors, which performed better than previous ones in realizing multi-exposure image and ball striking algorithms. Another study (Kim et al., 2014), measured perceptions of technology-based self-service (TBSS) (i.e. ease of use, performance, fun, sense of presence) on consumer productivity and behavioral intentions in virtual golf. Given that the perceptions of TBSS positively affected productivity and intentions to use, the researchers argued that technology advancements in the sports industry would provide both cost savings and increasing productivity (Kim et al., 2014).

In addition to technological aspects, Lee et al. (2013) examined the effects of presence, "an important psychological concept in media studies" (p. 932), on perceived enjoyment, perceived value and behavioral intentions. Presence, which was referred to as an individual's subjective sensation of virtual reality experience, was classified into two dimensions: (a) telepresence (an individual's psychological state physically exposed in a mediated environment) and (b) social presence (an individual's feeling of communication with people within the mediated environment) (Lee et al., 2013). Considering the result that only social presence played an important role in understanding perceived enjoyment, perceived value, and behavioral intentions, the author argued that the popularity of virtual golf was attributable to "an enhanced sense of socialization with other players" (p.930) rather than its technology.

Given the fact that actual golf might be influenced by location, time, and weather

(Han, 2004; Petrick et al., 2001; Zhang, 2007), virtual golf, which eliminated many limitations by its technology advancements, may be an option to attract avid golfers. In other words, the reason virtual golf became one of the most popular sport-related businesses in the Republic of Korea was to satisfy desires of avid golfers who have experienced constraints in playing golf. In 2012, G-Tour, which was the world's first professional virtual golf tournament, opened in the Republic of Korea on a nationwide scale (Noe, 2012). Considering the format and system of virtual golf has been applied to the G-tour, it might be understood how popular it was in the Republic of Korea. As such, it showed that the virtual golf industry was not a simple alternative which might overcome the limitations of actual golf, but a newly growing sport market which might have enormous potential. Also, it might be necessary to keep in mind that this phenomenon could be expanded to wider markets, as electronic sports such as sport-related video games did. However, considering that the fundamental purpose of playing golf was to be surrounded by nature, virtual golf also had participation constraints to attract actual golfers according to their preferences.

In summary, various types of sports have emerged with enhanced technology, and those have significantly increased in popularity (Ko et al., 2008). From that standpoint, the importance of investigating virtual golf in the Republic of Korea should not be overlooked. This newly emerging virtual sport has had little attention from marketing perspectives. Thus, comparing the participation constraints in the two contexts (in virtual and actual golf) (RQ1) offers a significant opportunity to understand consumer behaviors and develop the overall golf industry. For a more detailed understanding, the following section discusses the importance of demographic and golfographic variables on

individuals' behaviors.

Impacts of Demographic and Golfographic Variables on Constraints

In a service environment, there was no question that the most important factor affecting consumers' perceptions should be the service itself. Research using consumer segmentation through demographic variables (e.g., age, gender, marital status, and household income) might be the most fundamental in establishing effective marketing strategy for target consumers. To that point, Greenwell et al. (2002b) investigated the extent to which demographic variables affected perceptions of the sport-related service experience, indicating that different individuals might have different service perceptions even under the identical conditions. Based on the results that demographic variables affected the consumer decision-making process, they noted that more attention regarding customer segments would allow marketers to offer better service experiences.

According to Petrick et al. (1999), although research on consumer satisfaction in the golf industry has been investigated, there has been little attention regarding how demographic variables would affect customer satisfaction. Based on the fact that personal experience and evaluation regarding consumer behavior may be quite distinct, Petrick et al. (1999) analyzed the impact of selected factors (e.g., demographics, type of golf course, service, physical attributes) on satisfaction and perceived value. The findings indicated that the satisfaction and perceived value of golfers were different depending on types of courses played (e.g., premier, quality, and 9-hole courses). Mastery was an especially significant determinant because skilled golfers were less likely to be satisfied due to higher expectations resulting from more experiences on golf courses. Similarly, the authors found that household income may affect customer satisfaction and perceived

value, and noted that golfers with higher incomes tended to be less satisfied due to their higher expectations. Considering statements from Williams (1989) and Oliver (1980) that feelings of satisfaction might be determined by relative comparison with initial standards or reference points (i.e., expectation), the results would be not only understandable, but also valuable.

In the same vein, demographic variables (e.g., age, gender, marital status, and household income) and a golfographic variable (e.g., mastery) were applied in this study. Golfographics were defined as variables that related directly to golfing such as mastery, years of play, golf trips taken, golf membership, and frequency of playing (Yun et al., 2010). Specifically, two selected factors (household income and mastery) were independent variables in order to look at their influence on customer behaviors in virtual golf (RQ3).

In summary, consumer classification based on demographics and golfographics in virtual golf are an efficient way to obtain significant marketing information (Petrick et al., 1999). In the same vein, investigating selected factors in this study present a great opportunity to gain a comprehensive insight into golfers' consumption behaviors. The next section of this literature review discusses leisure constraints that may limit individuals' leisure participation. Theoretical development and concerns of leisure constraint studies were considered.

Leisure Constraints

As a tool to understand barriers to leisure activity participation, leisure constraints have been developed and extended through many discussions. The purposes of leisure constraints research were to understand diverse factors that might influence

leisure participation in an individual's daily life (Samdahl & Jekubovich, 1997), to analyze rapidly changing phenomenon in leisure preferences (Jackson, 1990a), and to explain variations in leisure choices for a wide range of the population (Jackson, 1990b).

A sedentary lifestyle might be one of the most significant factors to prevent people's active lifestyle (Henderson & Bialeschki, 2008). An excessive sedentary lifestyle potentially leads to increased dangers from physical and mental illnesses (Kobriger, Smith, Hollman, & Smith, 2006). Encouraging people to increase their physically active leisure participation rate was an urgent issue in that it reduces various types of physical, mental, and social risks such as obesity, diabetes, depression, and even social isolation (Kobriger et al., 2006). Increased attention to leisure participation may be parallel to concerns regarding a sedentary lifestyle which might threaten people's health. From that perspective, leisure constraints research has made significant contributions by providing understandings about an individual's leisure behavior over the decades.

First, through various approaches and developed constraints theories, recent leisure studies enabled (a) researchers to understand a complex decision making process in participating in physical activity, and (b) sport marketers to offer better environments to people by asking why they were constrained. Second, the findings from previous research might be applied to develop and to implement better management strategies in leisure activity (Jackson, 1988). Although some researchers found that perception of constraints did not necessarily prevent participation (Tsai & Coleman, 2009) and participation might not be dependent on the absence of constraints (Jackson et al., 1993), diverse barriers which might inhibit leisure participation existed. Based on the results of constraints research, an individual's leisure participation rate can be increased in spite of

various personal reasons. Third, insights gained through leisure constraints research can be great resources to analyze new aspects of leisure participation, like participants' motivations (Jackson, 1991). Considering the fact that the decision making process for participation was not systematically ordered (Tsai & Coleman, 2009) and was influenced by external factors (Henderson, 1997), constraints research has contributed to a wide variety of leisure studies. Jackson (1991) stated that "the concept of constraints can serve as a device to assist in perceiving new connections among apparently discrete facets of leisure, and therefore as a vehicle to facilitate communication among researchers with diverse topical interests and methodological orientations" (p. 279).

Initial Constraints Research

Leisure sports researchers and practitioners have been expected to minimize constraints and to maximize individuals' satisfaction of leisure participation (Iso-Ahola & Mannell, 1985). However, given that leisure implied a "realm of freedom" and leisure participation intentions could be influenced by external factors, it was necessary to examine social and psychological leisure constraints especially in a complex modern society (Marx, 1992). Because the absence of well-established leisure service systems might complicate the external factors affecting participation constraints, efforts for understanding participant behaviors could be needed.

Iso-Ahola (1981) developed a conceptual model and Iso-Ahola and Mannell (1985) expanded the model based on the fact that people are social animals. They argued the importance of individual social and psychological constraints in understanding leisure participations, although many other different types of leisure constraints existed. Especially considering that an individual could be affected by social atmosphere, leisure

constraints regarding social factors should be the most important when trying to comprehend behavior (Iso-Ahola & Mannell, 1985). In addition to social constraints, psychological constraints should not be overlooked because (a) strong criteria could not exist among individuals and (b) people continuously modified their definition of satisfaction through leisure participation. Moreover, depending on their durability, social/psychological factors were classified as permanent or temporary (Table 1). Lastly, after categorizing social and psychological leisure constraints, they stated that leisure constraints should be explored before, during, and after leisure experiences in order to understand the entire process of leisure participation.

Table 1.
Conceptualization of Sources of Constraints on Leisure

	Social-Personal	Social-Cultural
Permanent	Abilities Competencies Control	Social Norms Roles Obligations
Temporary	Attitudes Motives Needs	Social Interaction

Note. Sources of constraints were cited from Iso-Ahola (1981, p.73)

Hierarchical Leisure Constraints Theory

According to Crawford and Godbey (1987), it might be necessary to have various perspectives to understand an individual's leisure constraints. Previous studies examined only one relationship among preferences, constraints, and participation; that is, leisure preferences existed, and constraints intervened in participation. They proposed three types of constraints: (a) *Intrapersonal barriers* refer to individual psychological states which interacted with leisure preferences rather than intervening between preferences and participation (e. g., stress, depression, and anxiety), (b) *Interpersonal barriers* were the result of interpersonal interaction (e.g., relationship with a spouse, children, or friends,

and (c) *Structural barriers* involved common constraints as interacting between leisure preferences and participation (e.g., financial resources, lifestyle, season, climate, and work time). Based on the barriers, they presented three models of relationship among preference, constraints, and participation (Figure 1). Just like the previous argument that an individual might be influenced by social/psychological factors (Iso-Ahola & Mannell, 1985), Crawford and Godbey (1987) emphasized that the individual was entangled in diverse relationships with people (interpersonal barriers).

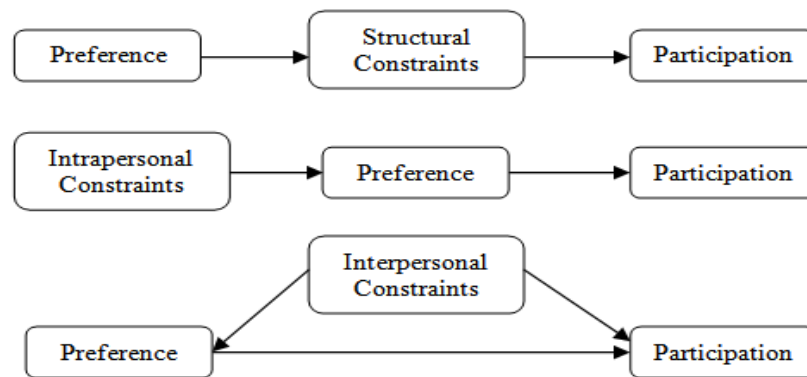


Figure 1. Three Models of Intrapersonal, Interpersonal, and Structural Leisure Constraints (Crawford & Godbey, 1987)

Crawford et al. (1991) enhanced the understanding of leisure constraints by modifying three existing models (i.e., interpersonal, intrapersonal, and structural constraints) established by Crawford and Godbey (1987). They argued that given that leisure participation might be decided by a sequential hierarchical procedure of constraints levels. The previous formulation of leisure constraints had to be developed to a single integrated model (Figure 2) (Crawford et al., 1991). The authors proposed three explanations based on the modified hierarchical model of leisure constraints: (a) leisure participation resulted from the successful confrontation of each constraint level, (b) the

sequential ordering of constraints implied a hierarchy of importance in that an individual could not reach the next constraint without successfully confronting a current constraint, and (c) the structural constraints (e.g., income and education) had a stronger impact on participation than was currently accepted.

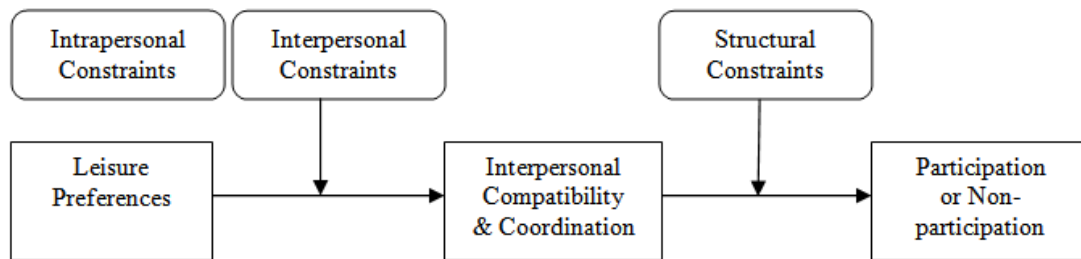


Figure 2. The Hierarchical Model of Leisure Constraints (Crawford et al., 1991)

In addition, as mentioned earlier, the common efforts from the majority of previous studies aimed to understand how leisure constraints might influence individuals' nonparticipation, but Crawford et al. (1991) suggested that constraints on leisure activities may continue to influence subsequent commitment after participation in an activity. Through development of leisure constraints models (Figure 3), the theoretical concept of leisure constraints enabled better findings that have not been understood previously.

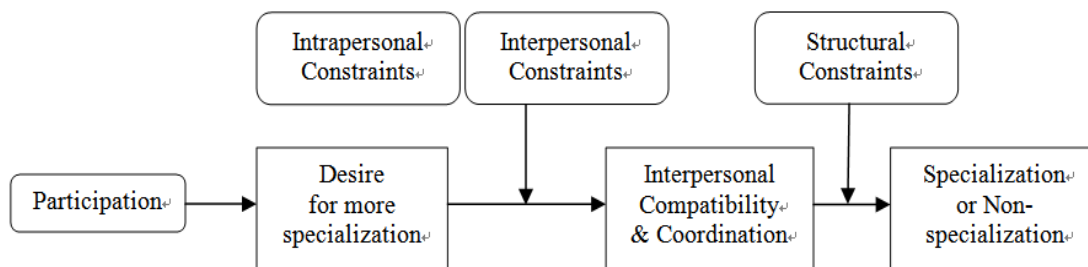


Figure 3. The Influence of Leisure Constraints on Activity Specialization (Crawford et al., 1991)

Whereas previous research (Crawford & Godbey, 1987; Crawford et al., 1991)

defined constraints on leisure participation as insurmountable barriers, Jackson et al. (1993) emphasized the "negotiation" process in an individual's participation decision. They noted that (a) when encountering a constraint, people might negotiate the constraint in various ways, (b) the outcome was not necessarily nonparticipation, and (c) participation through a successful negotiation process could be totally different from participation in the absence of constraints in terms of engagement level, frequency of participation and so on. In the same vein, Scott (1991) described how successful negotiation would be a prerequisite process of leisure involvement, indicating that leisure constraints might bring about modified participation rather than nonparticipation. When it comes to the role of negotiation on participation constraints and interactions among types of constraints, Jackson et al. (1993) put forward six propositions (Table 2).

Table 2.

Six Propositions of Negotiation and Constraints

<i>Proposition 1</i>	Participation is dependent not on the absence of constraints but on negotiating through them. Such negotiation may modify rather than foreclose participation.
<i>Proposition 2</i>	Variations in the reporting of constraints can be viewed not only as variations in the experience of constraints but also as variations in success in negotiating them.
<i>Proposition 3</i>	Absence of the desire to change current leisure behavior may be partly explained by prior successful negotiation of structural constraints.
<i>Proposition 4</i>	Anticipation of one or more insurmountable interpersonal or structural constraints may suppress the desire for participation.
<i>Proposition 5</i>	Anticipation consists not simply of the anticipation of the presence or intensity of a constraint but also of anticipation of the ability to negotiate it.
<i>Proposition 6</i>	Both the initiation and outcome of the negotiation process are depend on the relative strength of, and interactions between, constraints on participating in an activity and motivations for such participation.

Note. Six propositions were cited from Jackson et al. (1993)

As noted above, the theoretical approach of leisure constraint research has been developed from various perspectives in order to explain an individual's complex

psychological decision-making procedure. The concept of negotiation process in leisure participation, which was relatively recently proposed, has been widely applied in the leisure constraint research field. With continuous developments, leisure constraint research has expanded to obtain an extensive understanding of leisure participation.

Expansion on Leisure Constraints Decision Making Process

Jackson and Rucks (1993) compared constraints for continuous leisure participation and initiating participation to enhance the internal homogeneity of leisure constraints developed by Jackson and Dunn (1991). Their research had several limitations in the data collecting process, which was implemented in two separate surveys four years apart. This study was conducted with a single sample with identical survey scales and items to offer a better comparison of leisure constraints associated with two aspects of leisure participation. They indicated that whereas the results of the study generally supported previous research that the leisure constraints concept was internally homogeneous, some exceptions were also found. More specifically, although the data were collected from a sample group, there were significant differences between continuous participation and initiating participation on several constraint items (e.g., the cost of participation, being unsure where to participate, having no one with whom to participate, lack of transportation, lack of sufficient skills, took up different activity, no longer interested, and no opportunity). According to Jackson and Rucks (1993), “although the general concept of constrained leisure has proven to be a productive notion in leisure constraints research, serving as a useful device to enhance communication and cooperation, researchers and practitioners alike must recognize that it is an internally differentiated concept” (p.229). Thus, it might not be appropriate to apply the findings

acknowledged from previous investigations in terms of leisure constraints in all cases. Considering the diverse reasons for ceasing leisure participation depending on an individual's situation, various approaches from broader perspectives were needed.

Alexandris and Carroll (1997) aimed to (a) investigate constraints in leisure activities, (b) examine how leisure constraints influence participation or nonparticipation, and (c) explore how leisure constraints were related to frequency of sport participation, supporting the hierarchical model of leisure constraints (Crawford et al., 1991) that intrapersonal constraints played a significant part in leisure participation. In addition, with the modification and application of previous literatures (Crawford & Godbey, 1987; Crawford et al., 1991) mostly developed in North America, this research was designed to develop a scale of leisure participation for diverse regions. In contrast to previous literature (Shaw, Bonen, & McCabe, 1991) that leisure constraints might not necessarily inhibit participation in a leisure activity, this study found that less constrained people tended to have more leisure participation. Although there were not significant findings in interpersonal and structural constraints, three intrapersonal constraints (e.g., individual/psychological, lack of knowledge, and lack of interest) showed statistically significant differences between participation and nonparticipation, indicating "individuals who experience higher levels of intrapersonal constraints are less likely to participate in sports than individuals who experience lower levels of intrapersonal constraints" (Alexandris & Carroll, 1997, p. 11). Consistent with the result, Crawford et al., (1991), supported that leisure constraints might influence continuous participation in leisure activities because constraints were negatively related to frequency of participation in the study.

Hawkins et al. (1999) extended previous leisure-constraints studies (Crawford et al., 1991; Jackson et al., 1993) by investigating leisure-constraints inhibiting participation in leisure activities by people with mental retardation. Applying the existing leisure-constraints categories (i.e., intrapersonal, structural, and interpersonal), they found four reasons prohibiting leisure participation of people with mental retardation - (a) feeling guilty or bad, (b) perceptions of being too sick, (c) perceptions of being too old, and (d) concern over approval by friends and family members. Second, two structural constraints, (a) not knowing how to do the activity and (b) not having the necessary equipment, were loaded. Last, from the interpersonal category which might be the most significant factor in participating in leisure activities as an individual with mental retardation, participants indicated they were in need of help, and three reasons were identified (e.g., independent decision making, approval, and the lack of friends with whom to do leisure activities). Considering the fact that it was challenging for people with mental retardation to take part in leisure activities independently without any assistance, the influences of caregivers were likely significant. Further, even if people with mental retardation had personal interests, those might be highly influenced by other factors such as caregivers. “For example, interpersonal constraints may have multiple meanings depending upon where one is situated along the continuum from dependence to interdependence to independence with regard to the freedom to do as one wishes and the power to act upon one’s wishes” (Hawkins et al., 1999, p. 189). In addition, results stated that while intrapersonal reasons could not be salient factors, structural and interpersonal reasons could be negotiated. This research contributed to studies on leisure constraints by exploring diverse populations who lived in totally different situations.

In order to understand how motivation, constraint, and negotiation might be connected to each other in leisure activity participation, Hubbard and Mannell (2001) compared four models of leisure constraint negotiation (e.g., independence, negotiation-buffer, constraint-effects-mitigation, and perceived-constraint-reduction) They indicated that the constraint-effects-mitigation model had strong support (Figure 4), but the other models could not be supported due to inadequate fit to data. Based on the slightly modified version of the constraint-effects-mitigation model, they argued that “encountering constraints appears to set in motion two opposing forces-an inhibitory influence on participation stemming directly from the constraints, and a facilitatory influence on participation stemming directly from the constraints, and a facilitatory influence resulting from the negotiation efforts triggered” (Hubbard & Mannell, 2001, p. 158). Indicating the findings were consistent with the first proposition of negotiation developed by Jackson et al. (1993) that participation was dependent on the negotiation process, the authors emphasized the importance of negotiation on leisure constraints research.

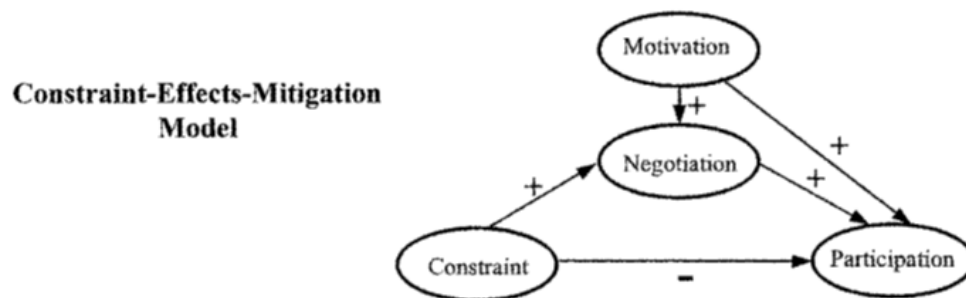


Figure 4. Constraint-Effects-Mitigation Model (Hubbard & Mannell, 2001, p.148)

Recent Leisure Constraints Research

Given that differences among individuals on leisure constraints existed, understanding their characteristics might be significant in investigating their leisure

participation. Jun et al., (2009) explored 16 leisure constraint factors identifying four dimensions: (a) other priorities, (b) setting elements, (c) access, and (d) social factors. Using cluster analysis (K-means procedure), respondents sharing common constraints were grouped as market segments: (a) other priorities, (b) highly constrained, and (c) least constrained. Lastly, impacts of five socio-demographics (age, gender, education, income, and race), motivation, involvement, and attachment on the three clusters were investigated. According to Jun et al. (2009), "identifying homogenous groups within the population who share similar perspectives with regard to their perceptions and experiences of constraints has the potential to assist service providers in their efforts to minimize or remove potential barriers" (p. 38). Considering the fact that individuals' experiences and thought could not be standardized, segmenting leisure participants based on their constraints enabled researchers to have a better understanding.

As recent society has become more complicated, social identity theory has been a significant concept in leisure constraint research because an individual should have several social identities (e.g., father, friend, and others) (Jun & Kyle, 2011a). Based on a premise that an individual's behavior was dependent on identity, to understand effects of accumulated social identities, two different perspectives were developed: (a) identity conflict and (b) identity facilitation (Jun & Kyle, 2011a) (Figure 5). The concept of two perspectives suggested that an individual's multiple social identities might be disadvantageous (identity conflict) or advantageous (identity facilitation). In that context, Jun and Kyle (2011a) investigated (a) the role of social identity on perceptions of leisure constraints and constraint negotiation process and (b) the relationship between constraints, negotiation, and participation. Findings indicated that the identity conflict/facilitation was

associated with constraints and negotiation. More specifically, whereas increased conflicts between identities caused increasing leisure constraints, identity facilitation encouraged them to negotiate constraints (Jun & Kyle, 2011b). Furthermore, although participation was influenced by constraints and negotiation, there was no significant relationship between constraints and negotiation (Jun & Kyle, 2011b). When it comes to the importance of social identity on leisure constraint research, the authors argued that "the ability to negotiate constraints is dependent on the compatibility between leisure identities and other identities held" (Jun & Kyle, 2011a, p. 195).

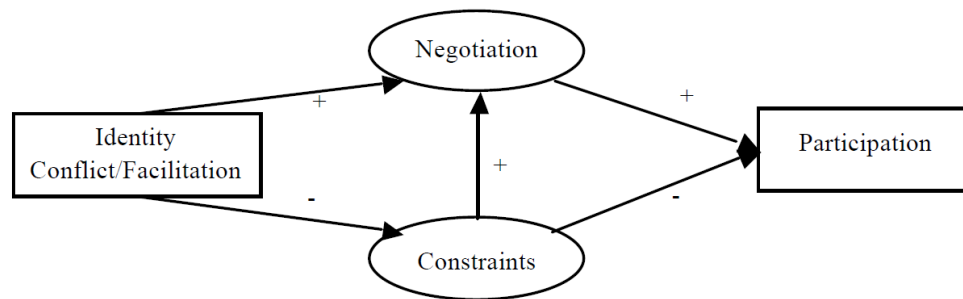


Figure 5. Proposed Model of the Leisure Negotiation Process (Jun & Kyle, 2011a, p.185)

In addition to social influences, psychological factors have been identified as significant in leisure constraint studies. White (2008) explored the leisure constraint negotiation process in that constraints for leisure participation might be influenced by negotiation efforts. In addition to negotiation, one more construct, negotiation-efficacy, defined as "people's confidence in their ability to successfully use negotiation strategies to overcome constraints they encounter" (Loucks-Atkinson & Mannell, 2007, p. 22) was added. By investigating the interaction of leisure constraints, negotiation, motivation, negotiation efficacy and participation in leisure activities, this study offered an important understanding of an individual's leisure choice and behavior, indicating that constraints

were identified as factors prohibiting leisure activity participation, and negotiation strategies were defined as a process to overcome the constraints. Findings showed that constraints (a) negatively affected leisure activity participation, (b) positively influenced negotiation which had little positive effect on participation, and (c) negatively affected by negotiation-efficacy. People who had high negotiation-efficacy could be more likely to overcome challenges they faced and participated in leisure activities by negotiating constraints for themselves. White (2008) suggested adding a 7th proposition to Jackson et al. (1993)'s list: "The greater people's confidence in the successful use of negotiation resources to cope with constraints, the greater the motivation, the greater the effort to negotiate, the lesser the perception of constraints, and the higher the level of participation" (p. 356).

In addition to negotiation-efficacy, another psychological element on the leisure constraint negotiation process, extraversion, might be a significant factor in overcoming diverse leisure constraints (Lyu et al., 2013). To understand the influence of this personality trait (extraversion) in people with disabilities, Lyu et al. (2013) investigated the effects of extraversion on: (a) affiliation, (b) ascendance, (c) venturesome, and (d) social interaction, as a significant sub-dimension on constraint negotiation process. Specifically, the theoretical framework developed by Hubbard and Mannell (2001) (i.e., constraint-effects-mitigation model) was applied with people with disabilities. Considering that leisure participation allowed people with disabilities to develop physical health and strengthen mental conditions, it was necessary to recommend leisure activities to overcome their challenges (Kolehmainen, Francis, Ramsay, Owen, McKee, Ketelaar, & Rosenbaum, 2011). Findings indicated that extraversion was a significant factor in the

constraint negotiation process. More specifically, the personality trait of people with disabilities was an intermediate influence between leisure constraints and participation (Lyu et al., 2013). The authors recommended further investigation for increasing participation by people with disabilities.

Around the same time, Lyu and Oh (2014) examined continual leisure engagement to encourage individuals' leisure participation. The fundamental research premise was based on a hierarchical model of leisure constraints proposed by Crawford et al. (1991). As reviewed above, the theoretical model assumed that leisure participants might encounter continual constraints although the initial leisure constraint was successfully negotiated (Crawford et al., 1991). Furthermore, to understand individuals' intentions for more frequent participation, Lyu and Oh (2014) addressed three leisure constraints (personal, interactional, and structural), two negotiation strategies (cognitive and behavioral), and commitment through a modification of the constraint-effects-mitigation model developed by Hubbard and Mannell (2011). The two negotiation strategies were applied as mediators between constraint negotiation process and behavioral intentions, and the dimension of commitment was addressed "as a surrogate for motivations" (p. 492). Results showed that time scarcity was the most significant factor on frequent participation, and the two negotiation strategies and commitment also had strong effects on habitual leisure participation (Lyu & Oh, 2014). The authors argued that researchers might have a better understanding of the complex individual decision-making process through modifying traditional approaches.

Concerns in Leisure Research

Definitional approach. When analyzing any social phenomenon, researchers

defined a variety of terms in order to provide better understanding and accuracy of results. However, because it was difficult to correctly define the terms with complex meanings, ambiguous definitions of terms were often controversial. Of course, the research of leisure constraints was no exception from these kinds of controversy.

Jackson (1991) argued that “the more inclusive term “constraints” is now preferred to the word “barriers”, because the latter fails to capture the entire range of reasons for, or explanations of, constrained leisure behavior” (p. 282). Crawford and Godbey (1987) have stated the meaning of the term “barrier” might be a part of the constraints, influencing both preference and participation. Thus, in order to understand more comprehensive and complex meanings of an individual’s decision-making process in leisure participation, the term “constraint” can be more reasonable than “barrier” as proper terminology for research (Crawford et al., 1991). Moreover, many studies for leisure participation and constraints have used both terms “recreation” and “leisure”, and there was no question that the difference of meanings between the terms might be ambiguous. However, most current research has adopted the term “leisure” as the dominant terminology. Jackson (1991) mentioned that “replacement of the word “recreation” with “leisure” simultaneously represents both broadening the focus of investigation and forging closer links than before with the mainstream of thinking in leisure studies” (p. 282). Leisure constraints research has developed through establishment of meanings of ambiguous terminology. The incorporation of new concepts and frameworks enabled leisure constraints studies to provide better understanding without any confusion (Jackson, 1991). As a result, the terms “constraints” and “leisure” were applied in this study.

Conceptual approach. Although previous research to examine leisure constraints has provided significant opportunities in understanding individuals' leisure participation and constraints, those might not be the best answer due to possible limitations in the research. Henderson (1997) addressed several concerns on constraints research. Given that leisure constraints might be just one dimension in explaining meanings of complex leisure participation behaviors, constraints theory alone might be misrepresented or oversold. Thus, the findings of the research should be seen as a tool to help to understand the complicated leisure decision-making process. Specifically, considering the fact that constraints could interact with preferences, participation, and the negotiation process, the hierarchy approach of understanding leisure constraints might have limitations (Henderson, 1997). Furthermore, knowledge of which social factors had the greatest impacts on individuals' leisure participation helped classify leisure participation as affiliative or self-determined. As such, Henderson (1997) argued that research on leisure constraints needed to have a broader view and more detailed classification of participants because previous studies might have various shortcomings.

Results and findings were interpreted by researchers with their own beliefs and values. Thus, whatever researchers try to investigate, the findings could be different depending on the a priori assumptions made and researchers' biases. Henderson (1997) stated that because all researchers may have bias, the results of all research will differ due to the interpretive approach of authors. Thus, researchers have to avoid blindly imposing results of leisure studies to all cases and suggesting them to everyone. "The constraints construct is commonsensical and appears to be relatively easy to measure. With the limitations of instruments and growing body of knowledge, however, researchers must be

careful not to force people to fit theory that may not be appropriate from them”
(Henderson, 1997, p. 456).

Methodological approach. Allender et al. (2006) aimed to understand why people did or did not take part in leisure activities by reviewing previous qualitative studies on leisure participation based on individual experiences and reasons for participation or non-participation in leisure activities. With respect to limitations of quantitative research and strengths of qualitative research, Allender et al. (2006) argued that whereas it might be difficult to investigate an individual's subjective thoughts using a quantitative approach, qualitative methods would be able to provide a detailed investigation of individual experiences and perceptions on leisure constraints. Considering the limitations of constraints research instruments and the latent diversity of target groups, it was necessary to find a new instrument and new methodological approaches (Henderson et al., 1988).

On the other side of the methodological approach, Jackson (1988) stated that understanding leisure participation can be strengthened by analyzing non-participants, identifying their characteristics, and asking why they did not participate (Crawford & Godbey, 1987). Especially given that people who did not take part in physical leisure activities were potential leisure participants, research examining non-participants can be meaningful for both participants and practitioners (Jackson & Dunn, 1988). A non-participant was defined as an individual who had a desire to participate in a leisure activity but was unable to do so because of the influences of one or more leisure constraints (Jackson, 1983). In that sense, analyzing non-participants might be better than understanding existing participants in order to examine why people did not participate.

Moreover, most leisure studies excluded non-participants who did not have an interest in participating in a new leisure activity (Jackson, 1983; Jackson & Searle, 1983). Of course, it would be impossible to consider all dimensions in doing research, but it would be necessary to have a broader perspective.

Consistent with the necessity of non-participant research, Jackson and Dunn (1988) noted that, “participation data reflect the net result of a complex set of recreational decision-making processes by participants. At an individual level, people continue previous activities, start new ones, and cease participating in others” (p.31). If there were consistent patterns of ceasing, starting, and continuing leisure activities, the results might be meaningful. Further, as mentioned earlier, non-participation research might provide a great opportunity to understand latent demand of leisure participation. Applying data drawn from leisure participants alone, “accurate conclusions cannot be drawn about non-participants who would like to participate but cannot for some reason. However, non-participation research can provide this information, together with data on other meaningful subdivisions of non-participants, such as former participants or those who have never participated” (Jackson & Dunn, 1988, p.32). The findings of non-participation studies can be better resources for leisure practitioners who already knew that it was impossible to explain leisure constraints with participation data alone because the information might be insufficient. Further, adding people who did not participate to one of the target groups in leisure activities might expand the leisure activity industry for marketing purposes and assisted practitioners in getting a more proper distribution of leisure services (Jackson & Dunn, 1988; Crawford & Godbey, 1987). To that point, the present study compared participation constraints between experienced and non-

experienced individuals in virtual golf in order to expand the consumer base by understanding the differences between these two groups (RQ2).

In summary, since the early stages of constraint research emphasized social and psychological impacts on leisure participation (Iso-Ahola, 1981; Iso-Ahola & Mannell, 1985), the theoretical developments have continued. Crawford and Godbey (1987) introduced three constraint models (e.g., intrapersonal, interpersonal, and structural constraints) and then Crawford et al. (1991) proposed a sequential hierarchical model, indicating that the decision making process was not systematically ordered (Tsai & Coleman, 2009). Furthermore, leisure constraints have been considered not insurmountable factors, but a negotiable concepts affecting an individual's decision even after participation (Crawford et al., 1991).

Leisure constraint research has evolved through theoretical development and efforts to resolve research shortcomings (Allender et al., 2006; Crawford & Godbey, 1987; Crawford et al., 1991; Jackson, 1983; Jackson, 1988; Jackson & Dunn, 1988; Jackson & Searle, 1983; Henderson, 1997). Nevertheless, it might be necessary to examine individual participation experiences and factors that might affect perceptions during and after leisure participation. In that sense, the next section of this literature review continues to explore individuals' decision-making process in physical activity participation. Given that virtual golf is a commercial business in the sports industry, the participants were considered consumers in the next section. Significant factors (service quality, perceived value, and consumer satisfaction) and behavioral intentions were considered in the next section.

Understanding Consumer Behaviors

Efforts for understanding service quality impact on consumers' dissatisfaction/satisfaction in recreational leisure facility environment were vital to sport managers because those factors were closely related to profitability of sports facilities (Yiannakis, 1989). Consumer satisfaction, which might be strongly influenced by service quality, was the most essential element in retaining individuals and enhancing a consumer base (Yu et al., 2014). All inter-related values (e.g., service quality, perceived value, consumer satisfaction, and behavioral intentions) should be investigated in order to establish a better leisure sports service environment. Further, considering that satisfied consumers might tend to be more likely to have positive future intentions (Yu et al., 2014), the relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions needed to be explored..

The primary purposes of this section were to (a) explore constructs (e.g., service quality, perceived value, consumer satisfaction and behavioral intentions) and (b) investigate the relationships among them to understand consumers' decision making process and to suggest useful information to researchers and practitioners in the recreational sports industry.

Service Quality

As a society has progressed and lifestyles have changed, people have become interested in improved service quality (Berry et al., 1990; Ko & Pastore, 2004). Accordingly, to satisfy consumers' diversified tastes and heightened expectations, service providers have become competitive (MacKay & Crompton, 1990; Wright, Duray, & Goodale, 1992). Given changing consumers' needs, it was necessary to investigate

service quality for all consumers, researchers, and marketers (Howat et al., 1993). Furthermore, Ko and Pastore (2004) noted that an attempt should be made to minimize gaps between service quality research and consumers' practical perception through various consumer samples and circumstances because "the meaning of quality is a relative concept and can vary under different circumstances" (p.159). Bitner and Hubbert (1994) defined the concept of service quality as the overall subjective impression after consumption. That is, research on service quality should be able to understand unpredictability and diversity of consumer evaluation. In this respect, the necessity and importance of service quality research has motivated researchers to (a) investigate how the service quality might be significant and (b) to develop efficient application of service quality to consumers.

The concept of service quality. In the initial stage of service quality studies, Gronroos (1984) noted that researchers should have a clear interpretation of what consumers were looking for and what they were evaluating in order to establish a conceptual model for future research. Service quality was composed of two dimensions: (a) technical quality (what a consumer gets) and (b) functional quality (how the consumer gets) (Gronroos, 1984). The technical quality might be a relatively objective construct in terms of the product itself, and the functional quality could be a subjective construct regarding the process of consumption. Even if the two types of service quality were interrelated, the technical quality should be a prerequisite of functional quality and the functional quality could be more significant than the technical quality in some cases (Gronroos, 1984). Therefore, service providers needed not only to consider both service quality dimensions, but also understand how consumers could be evaluate them.

According to Ko and Pastore (2005), it was necessary to investigate how to offer better service to recreational sport consumers. There has been relatively little attention paid to service quality although the term has been in a central position in various fields. Indicating the necessity of service quality research, they argued that, "within the saturated market of sport industries, the success of a sport organization may depend on the degree to which the organization can satisfy their consumers with quality service" (p. 159). Moreover, given the fact that "leading scholars have become confident in their argument that providing quality service is not only the most important factor for consumer satisfaction, but it is the principal criterion that measures the competitiveness of a service organization" (p. 158), they noted a well-established conceptual framework of service quality that could produce enhanced understanding and more efficient business strategy. Also, there was no doubt that providing higher service quality to consumers may determine the success of sport organizations and companies in more competitive business environments (Ko & Pastore, 2005). With service quality encompassing both tangible and intangible factors, they recommended researchers and practitioners in the sports industry consider various values and probability.

Because the production and consumption of a service were synchronized (Gronroos, 1984) in the sports industry, unlike normal business such as manufacturing, Chelladurai and Chang (2000) argued that the relationship between consumer and service provider was crucial. For example, a sporting event spectator would experience the production (the sporting game itself) and consumption (watching the sporting game) simultaneously. Based on classifying elements in terms of service quality in various ways: (a) targets of quality, (b) standards of quality and (c) evaluators of quality, they argued

that "while it is important for sport managers to view the totality of their operations, it is also necessary for them to break their operations into smaller discrete and distinct elements" (p.19). That is, the segmental perspectives would allow sports practitioners and researchers to provide improved service quality to consumers. If more detailed information would be available, higher service quality could be offered to consumers (Howat et al., 1999). Considering that offering a high-quality leisure service should be a prime concern, it should be important to know what consumers desire (Brady & Cronin, 2001). Moreover, given that efforts for understanding consumers' needs may facilitate better leisure services, research on service quality becomes more critical (MacKay & Crompton, 1990). With respect to the significance of service quality rather than other constructs, Crompton and Mackay (1989) argued that "because service quality is a controllable variable, it suggests that more may be gained by focusing research efforts on it rather than on measuring level of satisfaction because satisfaction is a psychological outcome that is partially dependent on a plethora of variables that are outside management's control" (p. 373).

Measuring service quality. Indicating that most of previous research has emphasized on quality of tangible items, Parasuraman et al. (1985) investigated a conceptual model in terms of intangible services quality. The authors argued that the importance of finding determinants of service quality has been growing because consumers have been requesting higher service quality than ever. Given that existing research failed to explain the concept of service quality clearly, they provided three words that might encompass characteristics of service quality: (a) *intangibility*: service quality cannot be measured before consumption, (b) *heterogeneity*: there might be differences

between what a service provider delivered and what a consumer received, and (c) *inseparability*: the production and consumption of service quality occurred simultaneously between consumer and employee. Furthermore, given that exact definition of terms was important because vague meanings of concepts might cause research confusion, Parasuraman et al. (1988) stated the conceptual difference between quality and consumer satisfaction as follows: "Service quality is a global judgement, or attitude, relating to the superiority of the service, whereas satisfaction is related to a specific transaction. The two constructs are related, in that incidents of satisfaction over time result in perceptions of service quality" (p. 16). That is, satisfaction was the "emotional reaction" based on service quality (Oliver, 1981), or "Quality leads to satisfaction" (Parasuraman, Zeithaml, & Berry, 1994, p. 121). The direction of consumer behavior can be seen in Figure 6.

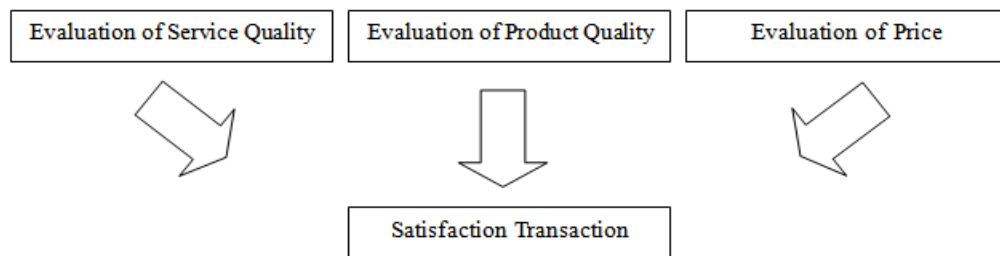


Figure 6. Components of Transaction-Specific Evaluations (Parasuraman et al., 1994)

In addition to conceptual understanding, empirical investigation on service quality should be based on proper measurement approach. Through executive and focus group interviews, Parasuraman et al. (1985) found 10 service quality determinants for future exploratory investigation: tangibles, reliability, responsiveness, competence, courtesy, communication, credibility, security, access, and understanding/knowing the consumer. Since then, Parasuraman et al. (1988) modified the 10 dimensions and proposed five

newly developed dimensions including 22 items (which is called *SERVQUAL*). The three dimensions (tangibles, reliability, and responsiveness) remained, and the rest of them (competence, courtesy, communication, credibility, security, access, and understanding/knowing the consumer) were combined into two dimensions (assurance and empathy) (Parasuraman et al., 1988). Additionally, through comparison with other research evaluating *SERVQUAL*, Parasuraman et al. (1991) reassessed and refined the *SERVQUAL* developed in 1985. Wordings of 22 items under the expectations section were modified by deleting inappropriate words which might induce biased thoughts in that previous statements were intended to capture subjects' normative expectations. Furthermore, given that ambiguous expressions might be problematic, two new items under tangibles and assurance were substituted through suggestions of questionnaire reviewers. The entire process of conceptual development offered by Parasuraman et al. since 1985 on service quality can be seen in Figure 7.

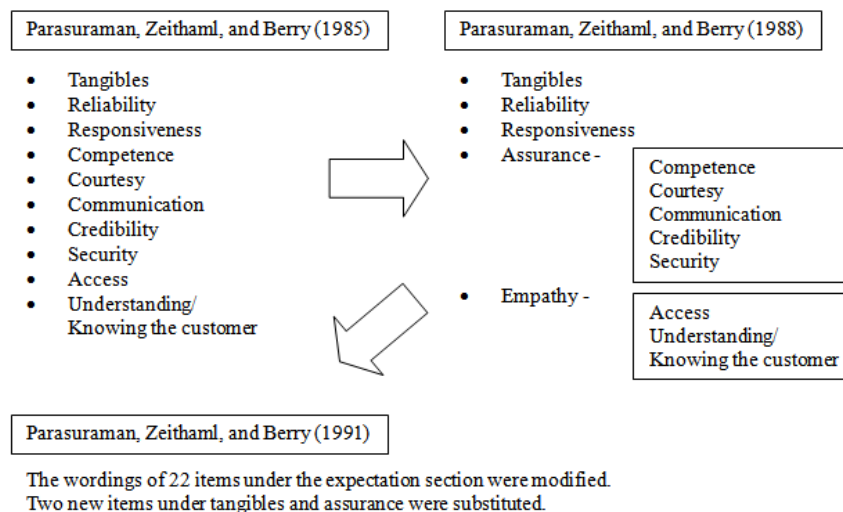


Figure 7. The Entire Process of Conceptual Development (Parasuraman et al., 1985, 1988, 1991)

As the measurement through *SERVQUAL* has been applied to a number of

studies for several decades, the methodological approach has been subjected to many criticisms (Asubonteng & McCleary, 1996; Cronin & Taylor, 1992, 1994). The reason many researchers and practitioners have had difficulties measuring service quality stems from distinctive characteristics (i.e., Intangibility, Heterogeneity, and Inseparability) (Mackay & Crompton, 1988) as mentioned earlier. Through criticisms and revisions, investigations on service quality have been developed, there was no doubt that the SERVQUAL approach has been popular worldwide and has been applied widely in spite of the shortcomings. Whereas the dominance of SERVQUAL still remained, efforts of establishing improved measurement on service quality was needed for fundamental research (Crompton, Mackay, & Fesenmaier, 1991). The theoretical and operational criticisms that have been mentioned for several decades were detailed and summarized by Buttle (1996) as below:

a) Theoretical

- SERVQUAL is inappropriately based on a disconfirmation paradigm and fails to draw on established economic, statistical and psychological theory.
- Gaps model: there is little evidence that customers assess service quality in terms of perceptions-expectations gaps.
- Process orientation: SERVQUAL focuses on the process of service delivery, not the outcomes of the service encounter.
- Dimensionality: SERVQUAL's five dimensions are not universal; the number of dimensions comprising service quality (SQ) is contextualized; items do not always load on to the factors which one would a priori expect; and there is a high degree of intercorrelation between the five dimensions.

b) Operational

- The meaning of the term, expectation, is not appropriate; consumers use standards other than expectations to evaluate SQ; and SERVQUAL fails to measure absolute SQ expectations.
- Item composition: Few items cannot capture the variability of each SQ dimension.
- Moments of truth (MOT): customers' assessment of SQ may vary.
- Polarity: the reversed polarity of items in the scale caused respondent error.
- Scale points: the seven-point Likert scale is flawed.
- Two administrations: two administrations of the instrument causes confusion.
- Variance extracted: the overall SERVQUAL score accounts for a disappointing proportion of item variances.

In the initial stage of study on service quality, the conceptual framework of service quality research might be classified into two representative approaches: SERVQUAL (Parasuraman et al., 1985, 1988) and SERVPERF (performance-based measure of service quality) (Cronin & Taylor, 1992). With theoretical and methodological criticisms about SERVQUAL based on the expectancy-disconfirmation paradigm, Cronin and Taylor (1992) suggested the SERVPERF (only performance-based scale). From the theoretical perspective, they argued that because the two constructs (expectation and perceived performance) were different, measuring service quality based on the expectations-performance gap would be inadequate. Furthermore, from a methodological perspective, the authors asserted that SERVPERF was more efficient (simplification of items), more superior (structure relevancy confirmed from Confirmatory Factor Analysis),

and more suitable for various service environments (from stepwise regression analysis). These two measurements (SERVQUAL and SERVPERF) led to the development of service quality research.

Improved measurements based on SERVQUAL. Despite the criticisms, since SERVQUAL was presented by Parasuraman et al. (1988), many researchers have utilized SERVQUAL, and the instrument has been improved to remedy shortcomings (Brady & Cronin, 2001; Howat, Absher, Crilley, & Milne, 1996; Howat et al., 1999; Ko & Pastore, 2004, 2005; Mackay & Crompton, 1990; Wright, Duray, & Goodale, 1992). A decade after SERVQUAL's introduction, representative scholars evaluated and revised the instrument in order to apply SERVQUAL to a wide spectrum of settings in the sports industry.

To consider suitability of an existing instrument in the context of recreation service quality, Mackay and Crompton (1990) investigated and proposed an instrument called RECQUAL which included 25 items and focused on five dimensions (Tangibles, Reliability, Responsiveness, Assurance, and Empathy) of service quality developed by Parasuraman et al. (1988). Even if they applied a seven point Liker-type scale in contrast to Parasuraman et al. (1988), the 25-item scale instrument mostly corresponded. According to Mackay and Crompton (1990), service quality in recreational sports environment could be improved "through evaluation and subsequent modification" (p. 55). Later, Wright et al. (1992) generated a 30-item scale to assess perceptions of service quality at recreation centers with modifications on both SERVQUAL (Parasuramen, et al., 1988) and RECQUAL (Mackay & Crompton, 1990), indicating that the measurement through the original SERVQUAL instrument and subsequent studies was too general to

produce detailed information for correct management practice. When it comes to applying the SERVQUAL measurement on service quality, the authors recommended future researchers (a) to make some adaptations in applying SERVQUAL items for proper information in given study and (b) to implement both qualitative and quantitative research methodology including open-ended questionnaires for more detailed information from consumers.

Similarly, Howat et al. (1996) developed a 15-item scale, which was called the Centre for Environmental and Recreation Management on customer service quality (CERM-CSQ). Although the authors argued that the CERM-CSQ focusing on leisure industry services was different from the SERVQUAL exploring financial services, CERM-CSQ was influenced by SERVQUAL because the items of CERM-CSQ can be classified under the dimensions of the SERVQUAL (Lam et al., 2005). The CERM-CSQ included four dimensions: (a) Core Services (program information, start/finish on time, activity range, organization, facility comfort, value for money, and quality equipment), (b) Staff quality (responsiveness, presentation, knowledge, and officials), (c) General facility (safe parking and cleanliness), and (d) Secondary services (food and drink and child minding). Furthermore, Howat et al. (1999) found that service quality might be explained from three dimensions including 19 attributes: (a) Personnel (staffing functions), (b) Core (principal role functions), and (c) Peripheral (secondary services). Core and personnel service were found to be significant influences on service quality, while the peripheral service was not. The authors suggested that peripheral service might be a secondary factor in assessing service quality. Considering these studies on service quality were

influenced by SERVQUAL's conceptual foundations, the influence of SERVQUAL's principles and the necessity of empirical approach on service quality appeared important.

With the recent increased attention on service quality in recreational sport, Ko and Pastore (2004, 2005) proposed an integrated model including four dimensions of service quality: (a) product quality: overall perception of service, (b) interaction quality: interaction between consumers and a service provider and among consumers, (c) outcome quality: what a consumer obtained from the service, and (d) environment quality: a sport facility where the service occurred, in order to contribute to sports organizations in establishing effective management and marketing strategies. The developed hierarchical model comprising multiple sub-dimensions of service quality, the Scale of Service Quality in Recreational Sport (SSQRS), provided reliable and valid measurement of service quality in recreational sport (Ko & Pastore, 2005). This service quality model stemmed from a hierarchical approach developed by Brady and Cronin (2001) that included three dimensions (interaction, environment, and outcome), indicating that consumers' perceptions of service quality might be formed and combined from multiple evaluation levels. The sub-dimensions of Brady and Cronin's work (2001) also stemmed from the SERVQUAL's five dimensions (Parasuraman et al., 1985,1988). The conceptual development process would be seen in Figure 8.

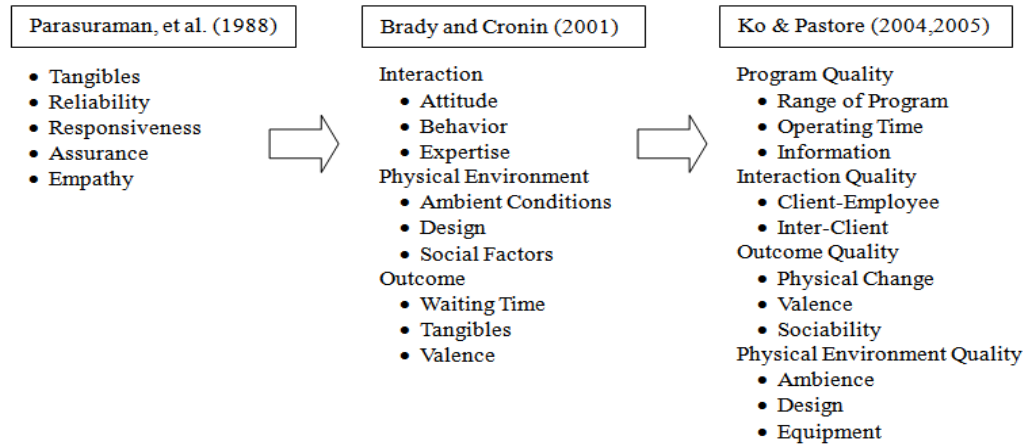


Figure 8. Conceptual Development Process of Service Quality (Parasuraman et. al., 1988; Brady & Cronin, 2001; Ko & Pastore, 2004, 2005)

New approaches in the sports industry. The efforts to develop conceptual and empirical approaches to provide improved service quality to consumers continued. Unlike previous studies modified or adapted from existing instruments, new methodological approaches have been introduced (Lam et al., 2005; Rial et al., 2010; Yildiz & Kara, 2012; Young & Pedersen, 2010; Yosuke et al., 2007) as researchers and practitioners needed to be prepared for various service environments.

Given the fact that gyms, health clubs, and the fitness industry have become more competitive due to increased health concerns, Lam et al. (2005) developed Service Quality Assessment Scale (SQAS) to investigate service quality of fitness clubs. Considering that consumers themselves might be the most significant profit resource and their retention behavior could be crucial, understanding service quality was necessary. Through a previous literature review, a 46-item scale found at an early phase was modified to a 40-item scale through exploratory factor analysis (EFA). Next, by implementing confirmatory factor analysis (CFA) and EFA, six permissible factors were confirmed: Staff, Program, Locker room, Physical facility, Workout facility, and Child

care. Finally, after eliminating 9 items, the 31-item scale with six factors was finalized (Figure 9). Lam et al. (2005) recommended future researchers consider further studies through applying other samples, comparing with other measurement scales, and conducting research with a qualitative approach to be create better suited instruments for service quality.

1. Staff Possession of required knowledge/skills Neatness and dress Willingness to help Patience Communication with members Responsiveness to complaints Courtesy Provision of individualized attention by instructors Provision of consistency of service	3. Locker room Availability of lockers Overall maintenance Shower cleanliness Accessibility Safety	5. Workout facility Pleasantness of environment Modern-looking equipment Adequacy of signs and directions Variety of equipment Availability of workout facility/equipment Overall maintenance
2. Program Variety of programs Availability of programs at appropriate level Convenience of program time/schedule Quality/content of programs Appropriateness of class size Background music Adequacy of space	4. Physical facility Convenience of location Hours of operation Availability of parking Accessibility of building Parking lot safety Temperature control Lighting control	6. Child care Quality of staff Cleanliness of equipment Hours of operation Adequacy of space Safety of environment Diversity of experience provided

Figure 9. Service Quality Assessment Scale (SQAS) (Lam et al., 2005)

Service quality in emerging sports. With sport fans' diverse tastes and desires, action sports (e.g., skateboarding, BMX bike riding, rock climbing and freestyle motocross) have recently gained popularity (Yosuke et al., 2007). Compared to traditional sports, more individualistic and risky action sports have become one of the popular genres in both spectator and participation sports. To investigate the impact of service quality on consumer satisfaction and behavioral intentions of an action sports event, Yosuke et al. (2007) categorized service quality into core and peripheral aspects. Considering the core (i.e., sport game itself) and peripheral service (i.e., ticketing and facility) were significant in professional sports contexts (Greenwell, Fink, & Pastore, 2002a), this investigation was necessary to understand consumer behaviors in emerging

sports. Findings indicated that both core and peripheral service quality affected consumer satisfaction and behavioral intentions. Regarding the result that the core service quality was a stronger predictor than peripheral service quality on consumer satisfaction, the authors indicated the unique characteristic of action sports consumers focusing on the competition itself (Yosuke et al., 2007). The consumption propensity might vary depending on the nature of sports, and the efforts to understand the diversity were necessary to offer better services for consumers.

With technical advancements in the internet, online fantasy sport has become one of the popular sport genres as a new pattern of sport-related consumption (Young & Pedersen, 2010). To understand the new emerging sport setting (online fantasy sport), Young and Pedersen (2010) examined participants' service quality perceptions of fantasy sports websites on consumer satisfaction, attitude, and actual usage by applying four perceived service quality dimensions: (a) ease of use (convenience in use), (b) trust (online security), (c) content (website resources or information), and (d) appearance (visual factors of websites). They found that the four factors of service quality positively impacted consumer satisfaction, and participants who were satisfied by fantasy sports websites were more likely to access the websites. Considering there might be significant differences in consumer behavior between traditional and emerging sports settings (Ko et al., 2008), this study provided theoretical and practical contributions to the literature in online-based sports consumption.

With significant growth in the number of physical activity and sport centers (PSC), consumers have emphasized maintaining a healthier life rather than participating in physical activity itself (Yildiz & Kara, 2012). To investigate the complex relationships

between service quality and consumer satisfaction, some scholars emphasized a universal standardized measurement for application in all service environments, while others argued context specificity in the sports industry (Yildiz & Kara, 2012). In agreement with the latter, focusing on the Sports and Physical Activity Services (SPS), Yildiz and Kara (2012) suggested a modified version (QSport-14) based on the existing version (QSport-10) proposed by Rial et al. (2010) through expansion of dimensionality. The improved instrument offered three crucial dimensions of service quality - Installation, Staff, and Program - by adding the dimension of programs (4 items). According to the authors, the modification of previous measurements enabled discovery of that omitted dimension and offered more detailed information to researchers. The procedure of measurement development of SPS could be seen in Figure 10.

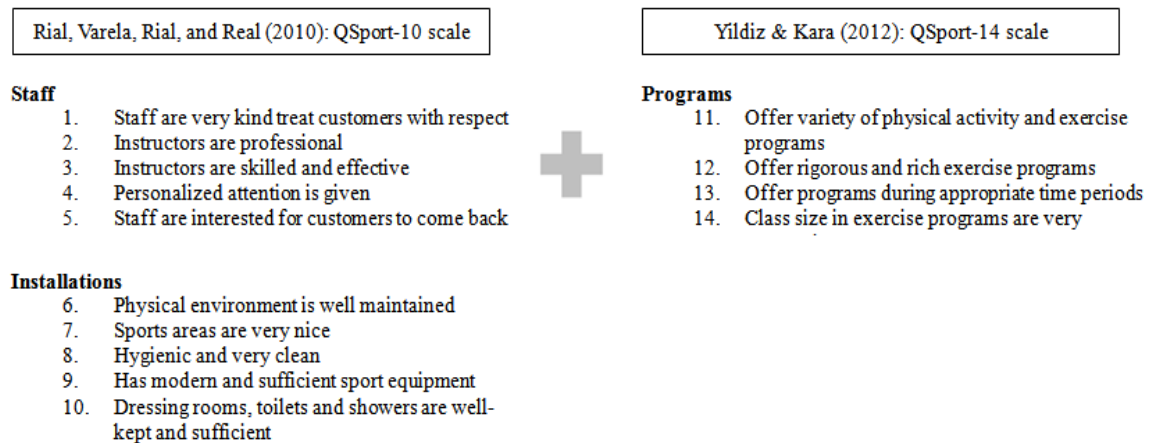


Figure 10. Service Quality of Physical Activity and Sports Centres (PSC) (Rial et. al., 2010; Yildiz & Kara, 2012)

In summary, given the fact that service quality has been a most significant factor for consumers in service environment, researchers have investigated service quality with various perspectives. Furthermore, the methodological approaches of service quality have been developed through supplementation and modification. Based on the fact that diverse

consumers' tastes might exist in various service environments, new methodological attempts that would be optimized in a specific service area also have been studied. The efforts to obtain more detailed information enabled researchers and practitioners to provide better service to consumers. The next section of this literature review explored another construct, perceived value, which might have a great impact between service quality and consumer satisfaction. In order to understand complex consumer's behavior, it was considered in the next section.

Perceived Value

When it comes to understanding consumers' satisfaction and their behavioral intentions, perceived value, has become a significant factor in the development of marketing in service industries (Cronin et al., 2000; McDougall & Levesque, 2000; Murray & Howat, 2002; Petrick et al., 1999; Shukla, 2010; Yu et al., 2014; Zeithaml, 1988). Before investigating the factor's impact on consumer satisfaction, conceptual differences between the factors needed to be considered (Zeithaml, 1988).

Efforts for differentiating two constructs (service quality and perceived value) that would greatly influence consumer satisfaction was necessary. With respect to difficulties understanding the conceptual difference between service quality and perceived value, Zeithaml (1988) noted that the indistinct meanings of the two concepts might limit investigation on consumer behavior and cause confusion in sharing research findings. According to Zeithaml (1988), service quality could be divided into two fundamental concepts: (a) objective quality, which referred to measurable superiority about objects on ideal standards and (b) perceived quality, which referred to the subjective consumer's evaluation about excellence of a product. Furthermore, Zeithaml (1988) developed four

definitions of perceived value in that diverse conceptual approaches have existed based on given subjects and industries: (a) value was low price, (b) value was whatever I wanted in a product, (c) value was the quality I got for the price I paid, and (d) value was what I got for what I gave. From these four expressions of perceived value, the author suggested a combined overall definition: "perceived value is the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given" (p. 14). Overall, perceived value (a) was more individualistic, (b) was a higher level concept, and (c) involved a tradeoff of give and get components (Zeithaml, 1988).

From conceptual perspectives, the relative attributes of perceived value was often interpreted as a mediating function under the relationship between service quality and consumer satisfaction (McDougall & Levesque, 2000; Murray & Howat, 2002). Given that perceived value may be a critical mediating element to consumer satisfaction which directly and indirectly had great effects on consumers' future intention, Murray and Howat (2002) examined the role of perceived value among service quality, consumer satisfaction, and future intention of consumers by evaluating a conceptual model. As can be seen in Figure 12, the value of the model was analyzed and re-analyzed as a mediator between satisfaction and future intentions because the direction between value and satisfaction was unclear. Additionally, service quality was divided into two dimensions: relational service quality (how it was delivered) and core service quality (what was delivered) as proposed by McDougall and Levesque (2000). Findings indicated that (a) both types of service quality were dominant indicators and (b) the value was a significant mediator of consumer satisfaction in a leisure sports context (Murray & Howat, 2002). Based on the result that perceived value had a mediating influence between consumer

satisfaction and behavioral intentions, the authors noted that existing marketing strategies should be modified with more specific information relating to perceived value. The indirect influence of perceived value between quality and purchase was outlined in Figure 11.

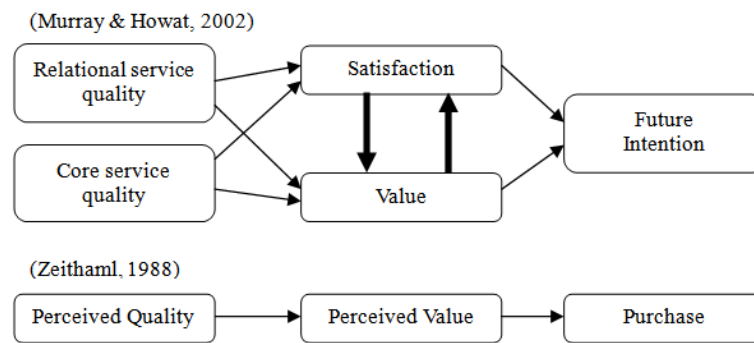


Figure 11. Path Model of Perceived Value (mediating role) (Murray & Howat, 2002)

On the other hand, in addition to the mediating role of perceived value, Cronin et al. (2000) and Yu et al. (2014) investigated the direct link among perceived value, service quality, and behavioral intentions. Considering the findings showing that the value had a significant direct effect both on consumer satisfaction and future behavioral intentions, the importance of the perceived value in service environments could grow.

Indicating that measurement of consumer satisfaction should be explored with perceived value in competitive business environments, Petrick et al. (1999) noted that perceived value should be considered a relative concept with service quality to be a successful business. Given that perceived value could be related to price or cost of a product or service, the extent of perceived value might be measured through comparison with quality or difference between cost and benefit (Yu et al., 2014). Similarly, McDougall and Levesque (2000) viewed perceived value as "benefits received relative to costs" (p.393). To respond to changes of business environment, consumer needs, or

competitor, the perceived value could be flexibly changed: "(a) offering comparable quality at a comparable price, (b) offering superior quality at a premium price, or (c) offering inferior quality at a discounted price" (Petrick et al., 1999, p. 43). The perceived value that might have changeable attributes has become of increasing interest to researchers to examine detailed considerable information and of a significant marketing resource to practitioners to provide better plans to consumers.

The perceived value of the mediating role between service quality and consumer satisfaction could be one of the most significant marketing resources in that lower service quality or negatively disconfirmed consumer's perception might be changed by the positive influence of perceived value. As a similar concept to perceived value defined as "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given" (Zeithaml, 1988, p. 14), Shukla (2010) proposed perceived sacrifice, "defined as what is given up to acquire a product or service" (p. 469). Stating the fact that a consumer made a final purchase decision through sacrifices, those perceived sacrifices could be classified into two aspects: monetary (price) and nonmonetary (time/effort). Regardless of the two attributes of perceived sacrifices, considering the fact that the perceived value was negatively or positively influenced by perceived sacrifices, Shukla (2010) recommended future researchers investigate the relationship between the constructs. Some consumers emphasized service quality rather than the costs (perceived value) that they paid (Cronin et al., 2000), but there was no doubt that perceived value would strongly influence consumer satisfaction. In this research, the two concepts (perceived value and perceived sacrifices) were combined to a construct, as a perceived value.

Generally, perceived value has been determined by its both functional and symbolic aspects, but sport-related consumption could be more related to symbolic perspective than functional perspective because of symbolic nature of sports (Kwon et al., 2007). Based on the assumption that sport fans will not be price sensitive, Kwon et al. (2007) examined the mediating role of perceived value between team identification and future behavioral intentions. Three conceptual models based on the extent of impact of perceived value between team identification and behavioral intentions were evaluated: (a) direct effect model, (b) partially mediated model, and (c) fully mediated model. Results showed that the partially and fully mediated models fitted well, that is, perceived value was a medium between team identification and behavioral intentions rather than an independent factor. Also as expected, the higher the perceived value was, the higher the behavioral intentions were. Kwon et al. (2007) recommended sport managers to remember that even highly identified sport fans were also concerned about price.

In this study to examine the impacts of service quality, perceived value, and consumer satisfaction on behavioral intentions of an emerging virtual golf business, perceived value would be one of the most crucial factors to satisfy consumers. Based on the situation that most golfers in Korea should cope with relatively higher cost in accordance with government policy (Achenbach, 2011; Choe, 2008), the literature presented in this section explored how the perceived value played a vital role between service quality and consumer satisfaction. With knowledge of a satisfied consumer would have a favorable behavioral intention, the next section continued to explore another construct, consumer satisfaction.

Consumer Satisfaction

Considering the fact that "loyal customers are not necessarily satisfied customers but satisfied customers tend to be loyal customers" (Fornell, 1992, p. 7), understanding consumers' experiences after consumption would be a most significant task. In order to meet both consumers' and producers' needs, scholars have investigated consumer satisfaction from various perspectives.

Definitional inconsistency. Even if there was a general consensus among researchers about the importance of an appropriate definition in a given study for better investigation, the definitional approach in consumer satisfaction research has still been controversial. Given that it would be impossible for scholars to produce a worthwhile contribution with generic and ambiguous definitions, well-established research should be implemented using an exact definition in order to objectively interpret research results and share the contributions with other researchers and practitioners. Furthermore, because a clear definition might be flexibly applied in diverse environments (including the sport industry), a priority would be to establish a clear definition. In the same vein, Kim, Magnusen, and Kim (2014) recommended to find a unified definition to prevent unnecessary confusion and avoid conceptual mistakes when applying different concepts of consumer satisfaction in different studies. There was no doubt that these efforts would be able to contribute to the development of a conceptual foundation on consumer satisfaction research.

When it comes to the shortcomings regarding the absence of a clear definition, Giese and Cote (2002) argued that the literature not only has applied a wide range of definitions of consumer satisfaction without any accepted agreement, but also has not yet

established a general-consensus definition of consumer satisfaction. With respect to seriousness of the problem, Kim et al. (2014) indicated that researchers should recognize "the pervasiveness of definitional and methodological inconsistency that stems mainly from the absence of clear and consistently followed conceptual guidelines" (p.339). Moreover, considering the fact that there might be difficulties in (a) choosing a proper definition for a given context, (b) measuring satisfaction correctly, and (c) interpreting research findings without a clear definition (Giese & Cote, 2002), the theoretical and empirical confusion could be problematic. Hence, the definition of consumer satisfaction needed to be explicitly justified. Similarly, Kim et al. (2014) pointed out research ambiguity caused by definitional inconsistency as follows: "research are largely dependent on how a researcher operationalized the concept of consumer satisfaction. A lack of conceptual uniformity leads to definitional variation. If there is definitional inconsistency, it may be impossible for researchers to compare research findings across studies" (p.339). Studies implemented with different definitions could involve different research directions and interpretations of findings, even though they had the same research purposes.

Additionally, considering the interrelation between academic and practical fields, the definitional ambiguity should be considered because various results found from academic research have contributed to practical marketing strategies in any other fields. That is, this issue would not be just for academic researchers. According to Kim et al. (2014), it could be impossible for practitioners to apply research findings examined with definitional irregularity to their marketing plans because the research findings might be incompatible in certain practical circumstances. Accordingly, Giese and Cote (2002)

concentrated efforts to seek congruence from previous literature, indicating that definitional considerations have had relatively little attention. They conducted group and personal interviews in addition to reviews of definitions applied in previous consumer satisfaction research to provide a definitional framework. Based on the results, the authors provided a clear definition of consumer satisfaction: "a summary affective response of varying intensity with a time-specific point of determination and limited duration, directed toward focal aspects of product acquisition and/or consumption" (p.2).

On the other hand, it could be impractical to have a unified definition of consumer satisfaction in that research in that field has been conducted with different purposes. Furthermore, it could be possible that meanings of consumer satisfaction would be totally different depending on the intention of authors even if the words were exactly the same (Table 3). In that sense, scholars have investigated consumer satisfaction with an optimized definition in their given study in a wide variety of fields. Based on an argument of Fornell (1992) that a context-based research approach might be more successful than a universally applicable research approach for consumer satisfaction study, researchers defined the concept of consumer satisfaction differently based on research purpose and direction.

Table 3.
Definitions in Consumer Satisfaction

Oliver (1997)	The consumer's fulfillment response (p.13)
Fornell (1992)	An overall postpurchase evaluation (p.11)
Tse & Wilton (1988)	The consumer's response to the evaluation of the perceived discrepancy between prior expectations and the actual performance of the product as perceived after its consumption (p.204)
Giese & Cote (2002)	"A summary affective response of varying intensity with a time-specific point of determination and limited duration directed toward focal aspects of product acquisition and/or consumption" (p.15)

Cadotte, Woodruff, & Jenkins (1987)	"Conceptualized as a feeling developed from an evaluation of the use experience" (p.305)
Westbrook (1987)	"Global evaluative judgement about product usage/consumption" (p.260)
Chullchill & Surprenant (1982)	"An outcome of purchase and use resulting from the buyer's comparison of the rewards and costs of the purchase relative to anticipated consequences" (p.493)

As can be seen in Table 3, consumer satisfaction would be regarded as an overall evaluation after consumption although researchers have suggested various definitions. Consistent with the argument that a study needed an optimized definition based on research purpose and researcher intention, this study followed the definition developed by Fornell (1992): "an overall postpurchase evaluation" (p.11). As mentioned earlier, the purpose of the current study was to investigate overall consumer behaviors in virtual golf before, during, and after their participation. Furthermore, the concept of consumer satisfaction implied a subjective evaluation after participation in this study. Accordingly, the definition of consumer satisfaction developed by Fornell (1992) corresponded to this research purpose and direction, including all key terms (i.e., overall, after participation, and evaluation).

Diverse theoretical approaches to consumer satisfaction. Consumer satisfaction should be the most important concept in marketing thought and practice without distinction of industrial structure or academic field because satisfaction was significantly associated with consumers' purchase, re-purchase, attitude, and brand loyalty (Churchill & Surprenant, 1982). Like a definition, "Consumer satisfaction is an overall postpurchase evaluation" (Fornell, 1992, p.11). The concept of satisfaction might be simply understood, but various theories and measurements have been developed in order to understand how consumers were satisfied or dissatisfied in a certain situation.

During the past several decades, theoretical approaches about consumer satisfaction have been proposed: (a) Expectancy-disconfirmation paradigm, (b) Comparison level theory, (c) Equity theory, (d) Attribution theory, (e) Norms as comparative standards, and (f) Value-percept disparity theory (Kim et al., 2014).

In four of these theories, Expectancy-disconfirmation paradigm, Comparison level theory, Value-percept disparity theory, and Norms as comparative standards theory, there might be a point of similarity in that consumer satisfaction was determined by comparing perceived performance (outcomes) to individual's subject standard of comparison. However, even if the theoretical approach might be similar, the conceptual differentiation among them existed in interpreting the word "standard". According to LaTour and Peat (1979), whereas the standard of Expectancy-disconfirmation paradigm was consumer expectation, that of Comparison level theory was experience formed by previous consumption and interaction with other consumers. Considering the fact that Expectancy-disconfirmation paradigm might be influenced by advertisement/promotion, the Comparison level theory focusing on consumers' experiences might be more objective (LaTour & Peat, 1979). Furthermore, in the Norms as comparative standards theory, the standard includes experiences of other brands, indicating that a consumer's subject standard might not be limited within a brand (Cadotte et al., 1987) because consumers could purchase a product/service from various brands and built their own standard by combining the experiences. The approach through the Norms as comparative standards theory would enable researchers to explore consumer satisfaction with broader aspects. Moreover, in the Value-percept disparity theory, the consumers' standard of comparison was not accumulated experiences from external factors, but consumers' immediate desires

and needs (Westbrook & Reilly, 1983). In spite of theoretical similarity, according to the point of view, the approach to investigate consumer satisfaction would vary.

The other two theories, Equity theory and Attribution theory, had basic differences from above theories in approaching consumer satisfaction. In Equity theory, consumer satisfaction was relational within interpersonal relationships (consumer and producer) (Adams, 1965). "Equity frameworks view consumers as individuals who will evaluate outcomes with inputs in order to create an inequity ratio. This ratio is then compared with those of sales persons and/or business firms" (Kim et al., 2014, p.340). This approach allowed researchers to understand consumer satisfaction through outcomes of both the consumer and producer, in contrast to the Expectancy-disconfirmation paradigm which considered only consumer outcomes. On the other hand, Attribution theory assumed that all consumers would experience satisfaction or dissatisfaction after consuming a product/service, and then they tended to find the causes (Weiner, 1992). According to Folkes (1984), the causes were classified into three characteristics: (a) locus of control (referred to whether or not the causes of satisfaction/dissatisfaction had something to do with the consumer (internal) or had something to do with the production or producer [external]), (b) stability (referred to the causes of satisfaction/dissatisfaction that was temporary or permanent), and (c) controllability (referred to whether or not the causes of satisfaction/dissatisfaction was controllable or uncontrollable). In this way, various theoretical approaches have been made.

Expectancy-disconfirmation paradigm. Even with the volume of research published in order to investigate consumer satisfaction in both sport and nonsport areas, the expectancy-disconfirmation paradigm focusing on the difference between consumers'

initial expectation and postpurchase experience remained the dominant theoretical approach. The following was a more detailed review of the past representative literatures about the Expectancy-disconfirmation paradigm.

In the early research stage of the expectancy-disconfirmation paradigm, with the knowledge of which favorable consumer satisfaction might cause improved business outcomes in marketing, Cardozo (1965) conducted a laboratory experiment to determine relationships among consumer effort, expectation, and satisfaction. The author noted that consumer effort (e.g., physical, mental, and financial resources) and expectation were key elements that affected a consumer's overall post-purchase satisfaction. Furthermore, Cardozo (1965) argued that practitioners in the sport industry should understand the correlation of the elements in that (a) consumer effort might change based on the amount of information given to them, (b) expectations could easily depend on advertisements and promotions, and (c) satisfaction would be influenced by consumer effort and expectation. As a result, Cardozo (1965) interpreted the findings that (a) contrary to the concept of efficiency, the greater the effort, the more favorable the satisfaction, (b) when the expectation was confirmed, consumers rated the product favorably, and (c) consumer post-purchase satisfaction was affected by extrinsic factors (e.g., effort and expectation) in addition to the product itself.

Another initial investigation of consumer satisfaction applying the expectancy-disconfirmation paradigm was implemented by Cohen and Goldberg (1970), stating that consumers' post-purchase evaluations about a product might be influenced by experiences compared to their own standard (expectation). The results conducted with a representative item easily purchased by consumers (instant coffee) found that the

confirmation-disconfirmation experience was a key factor in establishing consumer satisfaction, which was consistent with prior research (Cardozo, 1965). Given the fact that consumer satisfaction was a relative assessment through comparisons to individuals' subjective standard (Cohen & Goldberg, 1970), Cardozo (1965) recommended that "marketers should know what customer standards of evaluation are, and act accordingly" (p.249).

Knowing consumer expectation and disconfirmation were the most critical key point on consumer satisfaction research, Olshavsky and Miller (1972) investigated a hypothesis that a positive disconfirmed expectation might produce unfavorable consumer satisfaction, mentioning that a prior study (Cardozo 1965) only found a positive disconfirmation caused favorable evaluation. They introduced a 2x2 methodological design based on the intensity of expectation and perceived performance: (a) high expectation-high performance (*HE-HP*), (b) high expectation-low performance (*HE-LP*), (c) low expectation-high performance (*LE-HP*), and (d) low expectation-low performance (*LE-LP*). This model allowed researchers to test the probability that consumers with higher expectations might rate the product higher than others with lower expectation if their perceived performance were the same. Olshavsky and Miller (1972) found that "the subjects' evaluations of performance tended to be assimilated toward manipulated expectations, whether positively or negatively disconfirmed" (p.21). That is, the assimilation effect was reported from subjects in this study rather than the contrast effect.

Anderson (1973) noted that consumer satisfaction could be a complicated and unpredictable concept in that consumers' decision-making processes might be affected by various external values (e.g., social, economic, financial, political or personal). However,

considering that consumer satisfaction will guarantee purchase/repurchase intentions and improved business profit, finding conclusive factors to cause consumer dissatisfaction would be the most important task of researchers and practitioners. According to Anderson (1973), consumer dissatisfaction might be the extent of the negative difference between expectations and actual perceived performance, and marketing efforts to narrow the differences will be the best way to satisfy their expectations. For an investigation for the effect of expectation on perceived performance, Anderson (1973) established six expectation levels through differentiated product information given to subjects. Through the interpretation of the findings, the author noted (a) the assimilation effect because a group with unfavorably disconfirmed expectations rated higher than groups with expectations matching perceived product quality and (b) the contrast effect because subjects with extremely high expectations rated lower than subjects with moderately high expectation. However, given that consumer evaluation might be affected by the researcher's instructions or demands, the probability of biased consumer evaluation about perceived product quality might exist (Anderson, 1973). Similarly, LaTour and Peat (1979) also argued that " the purpose of the experiment was probably transparent to the subjects" (p. 432).

Based on the fact that consumers tended to be satisfied or dissatisfied by comparing product quality to their expectations (the Expectancy-disconfirmation paradigm), Swan and Combs (1976) analyzed whether or not "it is logical to assume that favorable judgments of performance would yield satisfaction and unfavorable judgments would lead to dissatisfaction" (p.26). The results were consistent with general findings of prior research that satisfaction stemmed from higher performance and dissatisfaction

resulted from lower performance (Swan & Combs, 1976), supporting the contrast theory. However, LaTour and Peat (1979) indicated two problems about their findings: (a) the evaluation about the product might be distorted because it depended on recollection of satisfaction or dissatisfaction and (b) the authors might miss an opportunity to find the assimilation effect in the given study because information on subjects who experienced slightly higher or lower perceived performance of the product than their expectations was not reported. The reason Swan and Combs (1976) found only the contrast effect in the study might be understandable was because there was a point of accepting disparity between expectation and performance, and consumers tended to assimilate their dissatisfaction within this threshold (Assimilation effect) (Anderson, 1973). Thus, the results and interpretations in a study could vary depending on research conditions and types of subjects. The assimilation and contrast effect on expectation disconfirmation would be illustrated in Figure 12.

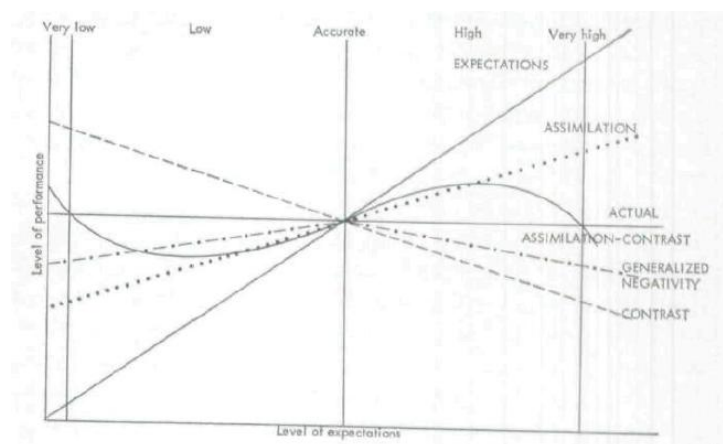


Figure 12. Theories of Disconfirmation of Expectations (Anderson, 1973)

Based on previous findings (Anderson, 1973; Cardozo, 1965; Olshavsky & Miller, 1972), consumer disconfirmation resulted from disparity between expectation and experience with the product, and caused favorable or unfavorable consumer outcomes.

Olson and Dover (1979) examined the effects of disconfirmed expectation through product trial. They indicated three problems of previous research: (a) a vague definition of expectation construct, (b) absence of an explicit explanation for disconfirmation, and (c) uncertain empirical research design. Accordingly, the authors (a) defined consumer expectation as pretrial beliefs (Olson & Dover, 1979), (b) applied assimilation and contrast theories, and (c) implemented their research with a experimental and control group to avoid biased judgments through comparisons. Olson and Dover (1979) found that pretrial consumer expectation, which was strongly affected by product trial (advertisement), was a powerful factor in their evaluation. Heightened expectations reduced negatively disconfirmed consumer evaluations. When it comes to the alternative theoretical perspective, the assimilation effect (post-evaluation might be closer to expectation) was found rather than the contrast effect. Kim et al. (2014) interpreted the findings (Olson & Dover, 1979) that "consumer expectations were found to function as specific belief elements within a cognitive structure" (p.342).

Oliver (1980) pursued an investigation to provide a reinforced understanding for the relationship among consumer expectation, disconfirmation, and satisfaction. The results of the research were consistent with previous findings, whereas negatively disconfirmed consumer expectation caused decreased product satisfaction, positively disconfirmed consumer expectation led to increased product satisfaction. Even if those findings were repeated like previous research, the authors noted that the study was implemented during the seven-month research period between pretest and posttest to avoid the recall effects. As Latour and Peat (1979) indicated that subjects' evaluations about a product might be influenced by memory, a relatively shorter research time-span

might produce inaccurate results. Thus, theoretical and methodological shortcomings should be also considered in the case of research for a short period of time. Around the same time, Tse and Wilton (1988) supported the fact that consumer satisfaction/dissatisfaction was determined by disparity between product expectation and perceived performance after consumption. Comparing subjective consumer standard established by previous experiences, positively or negatively disconfirmed expectations produced favorable or unfavorable product performance. However, Tse and Wilton (1988) found that subjects tended to put more weight on perceived performance than expectation in judging consumer satisfaction/dissatisfaction in multiple consumption situations.

Although various research approaches, samples, situations and products were applied to understand consumer satisfaction with Expectancy-disconfirmation theory, those showed analogous results. In the same vein, Churchill and Surprenant (1982) investigated (a) whether consumer satisfaction was influenced by disconfirmation and (b) whether the disconfirmation resulted from the difference between anticipated performance and perceived performance. However, unlike previous literature, the findings showed that (a) initial product expectation was not a significant determinant of consumer satisfaction and (b) only perceived performance affected consumer satisfaction even if there were differences depending on the type of products. Based on these research findings, marketing practitioners needed to establish appropriate strategies depending on the circumstances.

As mentioned earlier, the Expectancy-disconfirmation paradigm has been a predominant approach to understand consumer satisfaction since the 1970s (Churchill and Surprenant, 1982). Based on the general knowledge that marketers should understand

consumers' needs and provide their wants, Mattila and Wirtz (2001) investigated a link between performance, expectation, and consumer needs. Given that traditional research measurement might include evaluative factors in determining perceived performance, they applied two types of perceived performance (value-laden and objective). Furthermore, with the probability that previous research measurements might offer insufficient explanations about the relationship between performance and satisfaction, the authors added the concept of needs-congruency. Accordingly, Mattila and Wirtz (2001) conducted a 2x2x2 research design including perceived performance, expectation, and needs with two types of performance (objective and value-laden). They found that (a) the direct link between performance and satisfaction was weakened under the context of objective perceived performance, and (b) needs-congruency had stronger influence than the traditional concept of disconfirmation. Finally, the authors argued that the improved model would contribute to understanding of consumer satisfaction process.

To understand the complex interrelation between factors of consumer behavior, Cronin et al. (2000) emphasized understanding the effects of service quality, customer satisfaction, and perceived value on behavioral intentions, given that it might allow marketers in service environments have an insight into consumer patronage behaviors. The findings showed that all three variables directly influenced customers' behavioral intentions simultaneously. Although the conceptual models might be different based on the nature of the study, considering the fact that a favorable customer satisfaction led to positive emotional response on behavioral intentions, the importance of the determinants and consequences of consumer satisfaction should not be overlooked (Cronin et al., 2000).

Sport-based consumer satisfaction. Regardless of industry characteristics

(sport/nonsport), the ultimate marketing goal would be to satisfy and retain consumers. When studied in a sport context, consumer satisfaction research might be classified into two areas (Chelladurai & Chang, 2000): spectator satisfaction (Caro & Garcia, 2007; Greenwell et al., 2002a; Yoshida & James, 2010) and participant satisfaction (Howat et al., 1999; Murray & Howat, 2002; Theodorakis et al., 2004, Yu et al., 2014). By classifying consumer satisfaction in sport-related contexts, research enabled scholars to understand complex consumer behavior with more detailed information.

When it comes to consumer satisfaction in spectator sports, three representative factors have been (a) core product, (b) service personnel, and (c) physical sports facility (Caro & Garcia, 2007; Greenwell et al., 2002a; Yoshida & James, 2010). Compared with others, the core product has been the most important element that might affect overall consumer satisfaction in spectator sports (Greenwell et al., 2002a; Trail, Fink, & Anderson, 2003). The core product was defined as "game-related components" (p. 343): (a) team characteristics (team standing, winning percentage, number of star players, and team history) and (b) player performance (physical and technical superiority, playing hard, and exciting plays) (Yoshida & James, 2010). Considering employees at a sporting venue would be in contact with consumers (Greenwell et al., 2002a), interactions with service personnel might be also be considered significant. Given the fact that service providers needed to consider how the service quality was delivered (McDougall & Levesque, 2000), the importance of service personnel would be critical. The quality of stadium employees was defined as "a customer's perceptions of the attitudes and behaviors of stadium employees based on the interactions with ticket sellers, ticket takers, ushers, and concession clerks" (Yoshida & James, 2010, p.341). Lastly, the physical sports facility

was regarded as a stadium/venue where a sporting event is held. Moreover, because the physical facility might be a predictable or controllable element by facility management, it has received more attention to improve consumer satisfaction (Greenwell et al., 2002a).

Given the fact that consumer satisfaction in spectator sports might be the most significant determinant to attend future sporting events, Yoshida and James (2010) proposed a model of assessing the antecedents (service and core product quality) and consequences (behavioral intentions) of two types of satisfaction (service and game satisfaction). A model of relationships between service quality, core product quality, game and service satisfaction, and behavioral intentions was proposed. Additionally, using spectators from a professional baseball game in Japan and two college football games in the United States, the model was revised to a new model (Figure 13) including (a) stadium employees, (b) facility access, (c) facility space, (d) opponent characteristics, (e) player performance, and (f) game atmosphere. The findings showed that facility access, facility space, and behavioral intentions were rated more highly by the United States spectators, whereas player performance and game satisfaction were assessed more highly by Japanese spectators. According to Yoshida and James (2010), the new model allowed sport marketers to (a) identify relative impact of both service and core product quality on spectator satisfaction and behavioral intentions, (b) have advance understanding of both the service environment and stadium employees on service satisfaction, and (c) describe how game and service satisfaction would be formed.

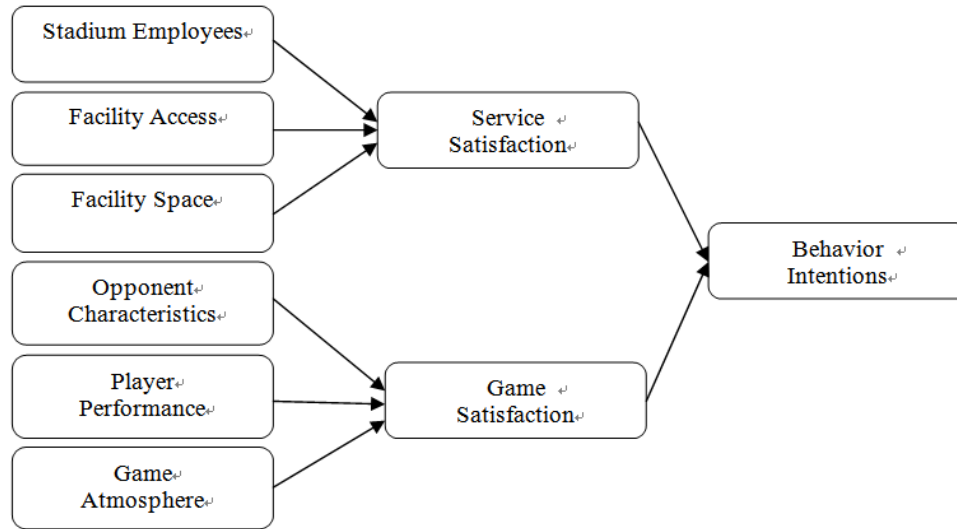


Figure 13. New Model of Game/Service Satisfaction (Yoshida & James, 2010)

Sport spectators could expect not only great game performance and favorable experience from stadium employees, but also a great physical sports facility. Even if the influence of the physical sports facility may be secondary to consumer satisfaction, in that it could contribute to consumer satisfaction research, Greenwell et al. (2002a) investigated the impact of physical sports facility (stadium access, facility aesthetics, scoreboard quality, seating comfort, and layout accessibility) on consumer satisfaction with core product and service personnel. Findings showed that although out of five elements only scoreboard quality was a significant determinant, the whole of the physical facility significantly predicted consumer satisfaction. Given that the physical sports facility did not account for a large amount of consumer satisfaction in spectator sports, the authors recommended considering the sports facility in combination with other factors: the core product and service personnel.

From a slightly different perspective from previous literature, arguing the importance of emotional influence on consumer satisfaction in spectator sports, Caro and Garcia (2007) recently investigated two hypotheses (Figure 14): (a) emotions (arousal

and pleasure) mediated disconfirmation on satisfaction, and (b) emotions were independent factors between disconfirmation and satisfaction. They found that the emotional factor (arousal) was the stronger influence than disconfirmation on satisfaction, whereas another emotional factor (pleasure) was not significant. Moreover, disconfirmation had a direct impact and arousal had an indirect impact on consumer loyalty over satisfaction (Caro & Garcia, 2007). However, considering that this research did not consider two factors that previous researchers argued were significant (i.e., consumer expectation and perceived value), the authors recommended future research integrate all factors which might affect consumer satisfaction for a more comprehensive model.

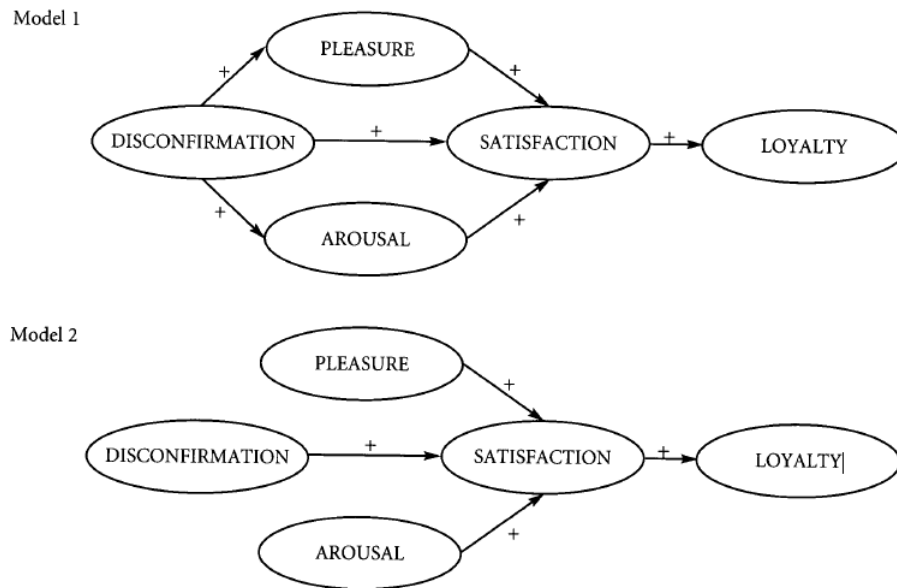


Figure 14. Competitive Models of Satisfaction (Caro & Garcia, 2007)

The other area of sport-based consumer satisfaction research was participant satisfaction. (Howat et al., 1999; Murray & Howat, 2002; Yu et al., 2014). With great interest in health, the importance of participation in physical activities has been emphasized. Given that preference for a sedentary lifestyle can be one of the most

significant factors discouraging people from pursuing an active lifestyle (Henderson & Bialeschki, 2008), encouraging people to increase their physical activity participation rate would be an issue in that it might reduce various types health risks (Kobriger, Smith, Hollman, & Smith, 2006). Increased attention to leisure participation paralleled concerns regarding sedentary life style which might threaten people's health. In this situation, based on the fact that satisfied consumers in participation sports tended to have favorable behavioral intentions (Yu et al., 2014), participant satisfaction research has taken a central position.

From a marketing perspective, participants' satisfaction with physical activity was a significant element in understanding consumers, planning marketing strategies, and maintaining positive relationships with customers in competitive sport business industry (Theodorakis et al., 2004). It was consistent with previous literature that customer satisfaction might play an essential role in positive behavioral intentions and customer loyalty. Theodorakis et al. (2004) investigated the consumer satisfaction of sport facilities with participants classified into four groups based on demographic characteristics (e.g., gender, age, education, and marital status). The results showed that whereas the dimension of staff had the highest score, the dimension of facilities had the lowest score. Furthermore, the male group and the lowest educational background group (elementary school) had significantly higher scores than other groups. Based on these findings, the authors argued that sport facility managers needed to consider demographic differences to provide better services and must remember the importance of the service personnel who directly interact with consumers.

In order to examine the role of consumer satisfaction between service quality and actual usage of sport-related websites, Young and Pedersen (2010) compared two conceptual models: (a) proposed model and (b) rival model. The comparative study enabled researchers to understand whether the consumer satisfaction was a mediating variable or an independent variable (Figure 15). Given that results showed that the proposed model fitted better than the rival model in terms of path coefficients and parsimony, consumer satisfaction provided by sport-related websites had an indirect effect (mediating role) between service quality and behavioral intentions.

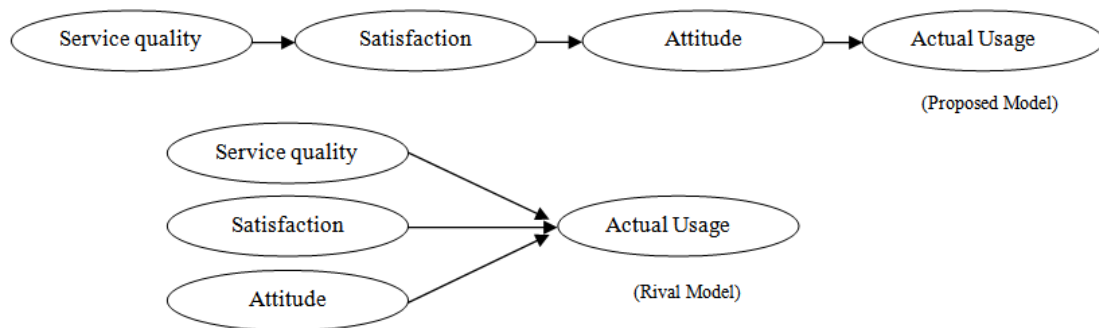


Figure 15. Proposed and Rival Model of Service Quality, Satisfaction, Attitude, and Actual Usage (Young & Pedersen, 2010)

Similarly, Yu et al. (2014) investigated relationships among service quality, perceived value, customer satisfaction, and behavioral intentions with individuals who were members at a recreational leisure facility. The study was conducted at a fitness center in Seoul, the Republic of Korea, using the Service Quality Assessment Scale (SQAS). The results indicated that perceived value and service quality had direct or indirect effects on customer satisfaction and repurchase intention, and customer satisfaction was the most significant factor on customers' behavioral intentions when

compared with other factors (e.g., service quality and perceived value). However, given that all participants in recreational leisure activities might have diverse life patterns and differences in personality (Shank, 2002), they indicated that sport managers should establish better marketing strategies suitable to customers' varied preferences. Although this study was implemented with older adult customers in the Republic of Korea, the findings were basically consistent with other research conducted in various countries and cultures.

Consistent with the findings reported by Yu et al. (2014), previous research (Murray & Howat, 2002; Howat et al., 1999; McDougall & Levesque, 2000) on participant satisfaction has noted that satisfaction was a consequence of service quality, and strongly impacted consumer re-participation intentions that affected profitability. As noted above, the proliferation of research about consumer satisfaction has been implemented in various theoretical perspectives, and the efforts have contributed to understanding consumers' decision-making processes. In the same vein, the current study examined consumer satisfaction of virtual golf with other constructs (service quality, perceived value, and behavioral intentions) in order to produce a better leisure environment of an emerging sport business. The following section explored the last construct, behavioral intentions, that would be the ultimate object of service providers.

Behavioral Intentions

As reviewed in this chapter, previous scholars have investigated significant constructs of service industry: (a) service quality (Berry et al., 1990; Bitner & Hubbert, 1994; Brady & Cronin, 2001; Chelladurai & Chang, 2000; Crompton & Mackay, 1989; Gronroos, 1984; Howat et al., 1993, 1996; Ko & Pastore, 2004, 2005; Lam et al., 2005;

Mackay & Crompton, 1988, 1990; Parasuraman, et al., 1985, 1988, 1990, 1994; Rial et al., 2010; Wright et al., 1992; Yosuke et al., 2007; Young & Pedersen, 2010), (b) perceived value (Cronin et al., 2000; Kwon et al., 2007; McDougall & Levesque, 2000; Murray & Howat, 2002; Petrick et al., 1999; Shukla, 2010; Yu et al., 2014; Zeithaml, 1988), and (c) consumer satisfaction (Anderson, 1973; Cardozo, 1965; Caro & Garcia, 2007; Churchill & Surprenant, 1982; Cohen & Goldberg, 1970; Fornell, 1992; Giese & Cote, 2002; Kim et al., 2014; Oliver, 1980, 1981; Olshavsky & Miller, 1972; Olson & Dover, 1979; Swan & Combs, 1976; Theodorakis et al., 2004; Tse & Wilton, 1988; Young & Pedersen, 2010).

Furthermore, constructive criticism has been offered (Asubonteng & McCleary, 1996; Buttle, 1996; Cronin & Taylor, 1992, 1994; Parasuraman et al., 1991; Yildiz & Kara, 2012) to provide more sophisticated information to future researchers and practitioners. There was no doubt that these efforts have contributed to a body of research in the service industry, and once again confirmed the fact that high quality service and reasonable price were essential for a high degree of consumer satisfaction and consumer retention. On the other hand, given that dissatisfied consumers might negatively affect market share and profitability, seeking the determinants of consumer discontinuance could be a primary objective of service providers (Shukla, 2010).

Considering the fact that attracting new consumers was six times more costly than maintaining existing consumers (Shukla, 2010), the ultimate objective might be to emphasize forming relationships with existing consumers to facilitate their retention (Backman & Crompton, 1989). Consumer behavioral intention were influenced by complicated mutual relationships among diverse factors, and intention might be regarded

as "an immediate antecedent of actual behavior" (Yu et al., 2014, p. 760). Given that consumers determined their continuance or discontinuance after purchase based on the level of consumer satisfaction, Backman and Crompton, (1989) outlined the consumer's psychological process (Figure 16). Moreover, after the consumers' determination of continuance and discontinuance, their psychological decisions would recur due to repeating certain consumption activities. In terms of the phenomenon, Backman and Crompton (1989) stated that "the serrated feedback loop between discontinuance and confirmation indicates that discontinuance of the service may only be a temporary state. At some future time, continuance is possible. Thus continuance or discontinuance is the outcome of a user's evaluation of the service each time the service is used" (p.57).

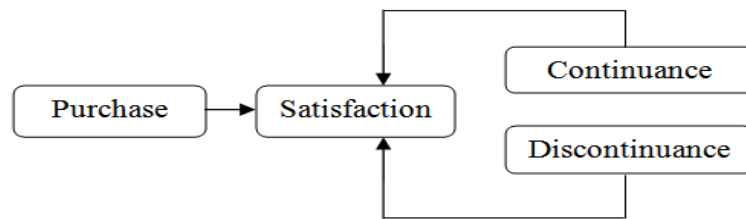


Figure 16. Process Model of the Continuance/Discontinuance (Backman & Crompton, 1989)

When it comes to the interaction between behavioral intentions and service quality, it was generally believed that service quality positively influenced behavioral intentions via confirmed consumer satisfaction compared to their initial expectation (Cronin & Taylor, 1992). Also, Shukla (2010) found that perceived service quality had a positive direct impact on consumer behavioral intentions, and consumers who had favorable experiences with high service quality were willing to pay a higher rate (Yu et al., 2014). McDougall and Levesque (2000) suggested a conceptual path that service

quality affected consumer satisfaction, which influenced consumer behavioral intentions, stating that those constructs would be considered simultaneously. On the other hand, from a marketing perspective, dissatisfied consumers had low retention rates could cause negative impact on profitability (Yu et al., 2014).

From a slightly different perspective, Yoshida et al. (2013) investigated relationships among quality, consumption value, and behavioral intentions at sporting events to find antecedences and consequences of spectators' consumption intention. A conceptual framework of this study included antecedences (functional, technical, and aesthetic quality), moderators (utilitarian, hedonic, and symbolic values), and consequences (behavioral intentions) (Figure 17). Indicating that previous literature has focused on only utilitarian value (monetary price and convenience), they added hedonic (entertainment and exploration) and symbolic (organizational identification and community prestige) values. Findings showed that all quality dimensions significantly impacted consumption values, and two values (entertainment and community prestige) had positive influences on behavioral intentions.

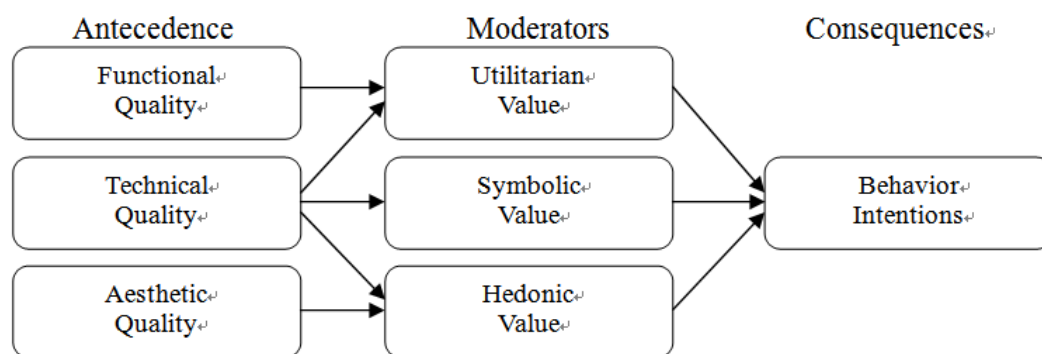


Figure 17. A Framework for Antecedence, Moderator, and Consequence (Yoshida et al., 2013)

As noted in the previous sections, given that service quality had strong direct or

indirect influences on customer satisfaction (Yu et al., 2014), and perceived value had a strong mediating role between them (Murray & Howat, 2002), both factors were significant elements in understanding the customer decision making process (i.e., behavioral intentions of customers). However, Petrick et al. (1999) argued there was no assurance that a satisfied consumer will return, and a dissatisfied consumer will not return. The exceptionality of consumer behavioral intentions was why this study investigated the relationship among the constructs. In that sense, to gain a better insight of the consumer decision-making process, this study explored relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions in virtual golf (RQ4).

Literature Review Summary

In the sport industry, advanced technology not only has brought about dramatic changes of consumption patterns, but also has generated new types of sports (Young & Pederson, 2010). Through a computer-based high definition golf simulator, virtual golf, also called "Screen golf", has had outstanding growth in the Republic of Korea (Jung et al., 2010; Kim et al., 2014; Lee et al., 2013). The virtual reality realized by the virtual golf system has attracted consumers, and the popularity of virtual golf has exceeded that of actual golf (Choe, 2008). Therefore, based on the fact that there were significant gaps between the existing sports genres and emerging sports (Ko et al., 2008), more investigation was needed on consumer behaviors of virtual golf to provide better experiences.

From a fundamental marketing perspective, because each individual's consumer behavior might vary (Greenwell et al., 2002b) and personal experience about consumption may be subjective (Petrick et al., 1999), consumer segmentation based on

demographic variables might be necessary to understand target consumers. Furthermore, golfographic variables (e.g., mastery and frequency of playing) with distinctiveness of golf could be also considered significant factors (Zhang, 2007). Given that consumers' subjective perceptions of leisure participation may be determined by distinct personal characteristics, the variables (i.e., household income and mastery) should not be overlooked (Oliver, 1980; Williams, 1989).

Considering actual golf might be influenced by external factors (e.g., location, time, rate, and weather) (Han, 2004; Petrick et al., 2001; Zhang, 2007), virtual golf might be an answer with strong potential, eliminating certain participation constraints through advanced technology. On the other hand, the technology advancements of the virtual golf might limit golfers' participation if an individual put emphasis on playing golf in nature. Thus, research on leisure constraints of the virtual golf would be a significant opportunity in order to explore diverse factors that may limit participation (Samdahl & Jekubovich, 1997), and to understand rapidly changing consumer behaviors (Jackson, 1990a; Jackson, 1990b).

Initial research on leisure constraints focused on social and psychological influences in that people were social beings (Iso-Ahola, 1981; Iso-Ahola & Mannell, 1985). With continuous conceptual developments, Crawford and Godbey (1987) proposed three types of constraints (e.g., intrapersonal barriers, interpersonal barriers, and structural barriers) and Crawford et al. (1991) modified them to a sequential hierarchical model because the decision making process was not systematically ordered (Tsai & Coleman, 2009). Furthermore, leisure constraints have been considered a concept influencing an individual's decision even after participation (Crawford et al., 1991) and

which might be negotiable. Until recently, the leisure constraint negotiation process, where an individual negotiates leisure constraints in various ways, has been discussed (Hubbard & Mannell, 2001; Jun & Kyle, 2011a, 2012b; Loucks-Atkinson & Mannell, 2007; Lyu et al., 2013; Lyu & Oh, 2014; White, 2008) in spite of definitional (Crawford & Godbey, 1987; Crawford et al., 1991; Jackson, 1991), conceptual (Henderson, 1997), and methodological (Allender et al., 2006; Henderson et al., 1988; Jackson, 1983; Jackson, 1988; Jackson & Dunn, 1988; Jackson & Searle, 1983) concerns.

In addition to leisure constraints, understanding various factors (service quality, perceived value, and consumer satisfaction) affecting individuals' behavioral intentions was also vital in retaining loyal consumers and enhancing the consumer base (Yu et al., 2014). In a changing society, an investigation of service quality was significant in that high service quality and successful business were interrelated through heightened consumer expectations (Berry et al., 1990; Bitner & Hubbert, 1994; Howat et al., 1993; Ko & Pastore, 2004; Yiannakis, 1989). Furthermore, consumer satisfaction would be another essential factor because satisfied consumers tended to have favorable behavioral intentions (Fornell, 1992). Accordingly, the proliferation of consumer satisfaction research has contributed to understanding consumer behaviors with various theoretical approaches (Murray & Howat, 2002; Howat et al., 1999; McDougall & Levesque, 2000; Yu et al., 2014). Although consumer satisfaction and service quality have been considered significant elements, relatively recently, perceived value in the sport industry has been examined as a mediator between service quality and consumer satisfaction (Cronin et al., 2000; McDougall & Levesque, 2000; Murray & Howat, 2002; Petrick et al, 1999; Shukla, 2010; Yu et al., 2014; Zeithaml, 1988). Satisfying consumers with high quality and

reasonable price (perceived value) would be the best way to form relationships with consumers to facilitate their retention (Backman & Crompton, 1989; Shukla, 2010). As noted in this chapter, previous research (Murray & Howat, 2002; Yu et al., 2014) found that various leisure constraints limited individuals' leisure participation, and service quality, perceived value, and consumer satisfaction had great impacts on behavioral intentions (Murray & Howat, 2002; Yu et al., 2014). However, the exceptionality of consumer behaviors, which might be subjective and relative in numerous instances, was why this investigation of virtual golf from a marketing perspective was significant.

CHAPTER III

METHOD

This chapter discusses the methodology applied to address the study's purposes and research questions. Specifically, the chapter focuses on research design, study participants, sampling procedure, data collection procedure, instrumentation, and data analysis.

Purpose of the Study

Given that constraints on leisure activities influence individuals' decision to participate in an activity (Crawford et al., 1991), it is essential to study these leisure constraints. Because virtual golf is a newly emerging sport-related business, eliminating factors (constraints) that might limit leisure participation may provide more opportunities to participate. Also, considering that virtual golf is a participation sport and consumers themselves might be the most important asset for a successful business, investigating relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions is significant as well. In other words, satisfying consumers with high quality and reasonable pricing (perceived value) would be the best ways to form better relationships with consumers and potentially facilitate their retention (Backman & Crompton, 1989; Shukla, 2010).

Accordingly, the primary purposes of this study were a) to investigate differences of golfers' constraints between participation in actual golf and virtual golf, b) to compare constraints between experienced and non-experienced individuals in virtual golf, c) to

examine effects of household income on constraints in virtual golf, d) to investigate effects of mastery on constraints in virtual golf, and (e) to explore relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions in virtual golf.

Research Questions

RQ1: What are the differences in constraints between participation in actual golf and virtual golf?

RQ2: Which constraints differ between experienced and non-experienced golfers participating in virtual golf?

RQ3: Which constraints differ among household income levels (high, medium, and low) in participating in virtual golf?

RQ4: Which constraints differ among mastery levels (master, advanced, intermediate, and beginner) in participating in virtual golf?

RQ5: What are the structural relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions in virtual golf?

Research Design

In order to address the research purposes and research questions in this study, a cross-sectional survey design, which has advantages of examining current social phenomenon and requires a relatively short time to deliver results (Creswell, 2008), was implemented in this study rather than a longitudinal design. Quantitative data collection through survey questionnaires allows researchers to statistically investigate the responses, interpret the meaning of the results (Creswell, 2009), and generalize the findings (Dillman, Smyth, & Christian, 2008).

The primary purpose of this study was to investigate sport-related consumption behaviors through significant factors (i.e., participation constraints, service quality, perceived value, consumer satisfaction, and behavioral intentions) in a newly emerging sport business (i.e., virtual golf). Considering the fact that survey designs help (a) describe trends, (b) identify individuals' opinions, and (c) determine personal beliefs and attitudes (Creswell, 2008), the design corresponded with the research purpose to understand consumer behaviors of an entire population by utilizing quantitative data from a selected sample.

Furthermore, survey designs have been the most frequently used research designs to understand sport fans' behavior in the sport management field. Specifically, the majority of research in leisure constraints (e.g., Hubbard & Mannell, 2001; Jun & Kyle, 2011a, 2011b; Tsai & Coleman, 2009; White, 2008) and consumer behaviors related to service quality, perceived value, satisfaction, and behavioral intentions (e.g., Greenwell et al., 2002a, 2002b; Lam et al., 2005; Ko & Pastore, 2005; Kwon et al., 2007; Yoshida & James, 2010) applied survey research design.

Study Participants

The target population for this study was individuals who have awareness about actual golf and virtual golf in the Republic of Korea. All study participants responded to a question about their golf experiences in actual and virtual golf, and the answers were the criteria to determine who belonged to each research question. In the first, second, and third research questions, the entire sample was utilized to investigate the effects of golf context, experience, and household income in virtual golf. In the fourth and fifth questions, to analyze the influence of mastery and consumer behaviors in virtual golf,

experienced golfers in virtual golf were selected.

According to Creswell (2009), it was necessary to state the size of the target population and availability of potential respondents in the population. While there were approximately 260 golf courses in the Republic of Korea, the number of virtual golf centers was more than 10 times than that of actual golf (Choe, 2008). With the growth and popularity of virtual golf as a social phenomenon, the Republic of Korea also has become the leading country in virtual golf simulator systems (Chung, 2010), and the virtual golf has become the most successful sport-related business in the Republic of Korea (Han et al., 2014). There were approximately 6000 virtual golf centers operating 15,000 virtual simulator systems with around 300,000 golfers regularly playing at virtual golf centers (Chung, 2010). The target population will actually be larger, as the study also included individuals who had no experiences in virtual golf. However, investigations on consumer behaviors applying survey design research have been implemented across the sport management field utilizing large populations.

As mentioned in the Chapter II, few investigations on virtual golf have been implemented. Han et al. (2014) surveyed members of golf clubs in the Republic of Korea to examine relationships among perceived benefits, attitude, image, desire, and intention in virtual golf. Lee et al. (2013) investigated the impacts of telepresence and social presence on consumer behaviors with virtual golf using customers at virtual golf centers in the Republic of Korea. Similarly, Kim et al. (2014) also collected data with customers at virtual golf centers to understand effects of technology innovation on customer productivity. Furthermore, investigations on actual outdoor golf have been conducted with golfers (Petrick et al., 1999, 2001; Zhang, 2007). Thus, individuals who had

awareness about actual golf and virtual golf in the Republic of Korea will be an ideal population in this study to investigate consumers' behaviors in virtual golf.

Sampling and Data Collection Procedure

This section discusses sampling and data collection procedures applied in this study. Sampling is a research procedure of selecting a relatively smaller sample of a population in order to generalize results of the research to the population (Ary, Jacobs, Sorensen, & Razavieh, 2010). Based on the practicality of the data collection procedure and the direction of this research, sampling will be performed to sample individuals who have awareness about actual golf and virtual golf in the Republic of Korea.

With the survey respondents selected through the sampling, this study will collect data using the intercept data collection technique. Two graduate students (data coordinators) in sport management who have worked as golf teaching professionals in the Republic of Korea will be in charge of the data collection procedure. These data coordinators will be instructed in the study purposes, the research direction, and data collection procedure. Prior to data collection, all research respondents will be informed about research purposes, survey discontinuance, and human subjects protection requirements from the university's Institutional Review Board (IRB). After survey respondents complete the survey questionnaires, coordinators will seal and return them to the researcher. The intercept survey was conducted at pre-assigned locations, where target samples will be likely to congregate. Thus, the data collection procedure was implemented at five virtual golf centers, two driving ranges in Seoul, and two actual golf country clubs (one private and one public course) in the suburbs of Seoul. Specifically, a multi-purpose sports center with various facilities (e.g., a gym, swimming pool, indoor

driving range, and restaurants) was selected as a one of the two driving ranges. It enabled the data collection from individuals with diverse golf experiences, including those without any experience in both actual and virtual golf. As mentioned earlier, respondents who have never played golf in either context were included because one of the research purposes was to explore leisure constraints of potential consumers. Given that the virtual golf is an emerging sport industry looking for new consumers, the efforts to understand potential consumers would be essential.

Some researchers have been concerned about the representativeness of results from the intercept survey technique because all potential respondents might not have an equal chance of participating in the study (Creswell, 2008). Nevertheless, the intercept data collection technique was used due to participant availability and convenience. Furthermore, given that research respondents in public places tended to spend relatively less time completing the survey (McKenzie & Mistiaen, 2009), the quality of their responses might be concerning as well. To minimize this potential disadvantage, the survey questionnaires were developed concisely to maintain respondents' focus during data collection with self-administered questionnaires (SAQ), a computer-based data input method. The respondents will voluntarily complete the survey by using tablet computers (i.e., iPad). However, it is also available to choose paper-based survey or an internet-based online survey link (i.e., Qualtrics) to increase response rate, if asked.

This researcher conducted (a) a set of paired samples of t tests, (b) a series of Multivariate Analysis of Variance (MANOVA), and (c) Structural Equation Modeling (SEM) to address five research questions. To generate sound results, adequate sample size in accord with statistical and inferential requirements is essential. From a statistical

standpoint, *t* test was allowed even with extremely small sample size ($n < 5$) (de Winter, 2013). Next, based on the fact that a minimum of 15 subjects was recommended per each independent variable in MANOVA, Stevens (2009) noted that sample size might not be a controversial point in MANOVA when over 100 subjects participated in the given study. Moreover, in the structural equation modeling (SEM), although adequate sample size was dependent on the estimation method for a given study, the recommended value was 20 times the number of free parameter estimated (Kline, 2005) or any number above 200 (Garver & Mentzer, 1999; Hoelter, 1983) in order to ensure sufficient statistical power. Lastly, to minimize sampling error, Dillman et al. (2008) recommended a sample size of 384 for a population of 1,000,000 for a 95% confidence level with less than 5% sampling error. Generally, given that sampling error was discussed because it was not feasible for a sample to represent a population due to personal or financial limits, having large sample size may be the best way (Dillman et al., 2008; Needham & Vaske, 2008). Therefore, this study will collect completed survey data from over 384 participants to follow those statistical standards.

Instrumentation

The survey contained six sections: (a) leisure constraints, (b) service quality, (c) perceived value, (d) consumer satisfaction, (e) behavioral intentions, and (f) golfographic and demographic information. Survey items are discussed in this section. The completed survey can be found in Appendix A.

Leisure Constraints

Understanding leisure constraints preventing individuals' participation was necessary to examine rapidly changing preferences (Jackson, 1990a; Samdahl &

Jekubovich, 1997) and to investigate subjective choices of a large population (Jackson, 1990b). In spite of arguments that the perception of constraints did not necessarily limit participation (Tsai & Coleman, 2009) and participation might not result from the absence of constraints (Jackson et al., 1993), the investigation of leisure constraints shouldn't be overlooked when attempting to understand complex consumer behaviors.

This study utilized dimensions of leisure constraints developed by Jun and Kyle (2011a), containing seven sub-dimensions including 25 items (7-point Likert-type scale). The reported seven construct leisure constraints scales showed reliable Cronbach's alpha which were greater than .70 to be acceptable internal consistency (Nunnally & Bernstein, 1994): (a) social ($\alpha = .76$), (b) health ($\alpha = .84$), (c) skill ($\alpha = .85$), (d) confidence ($\alpha = .92$), (e) cost ($\alpha = .90$), (f) weather ($\alpha = .78$), and (g) time commitment ($\alpha = .76$). All of factor loadings were statistically significant ($p < .01$), ranging from 0.52 to 0.91, indicating all factors were correlated. The observed fit statistics showed a satisfactory model fit to data ($\chi^2 = 990.54$, normed fit index (NFI) = .95, comparative fit index [CFI] = .96, root mean square error of approximation [RMSEA] = .089) (Jun & Kyle, 2011a).

Although the dimension, Weather, might not be related to virtual golf (indoor sport), it will be necessary to investigate constraint differences between actual golf and virtual golf (RQ 1). Considering that participation in actual golf might be limited by severe weather conditions, the dimension could provide a research opportunity as a significant factor to examine whether virtual golf may eliminate a constraint of actual golf. More detailed information of leisure constraints survey items can be found in Appendix A.

Service Quality

Given service quality has been shown as an indispensable construct in the service environment, previous research explained the meaning of service quality as a relative concept from various service environments (Ko & Pastore, 2004) and an overall subjective perception after consumption (Bitner & Hubbert, 1994). The efforts to collect more detailed information will provide researchers insights to offer better service to consumers. In the same vein, this researcher addressed service quality one of the significant constructs in this study.

The dimension of service quality included two sub-dimensions (7-point Likert-type scale): (a) Staff and (b) Facility. The dimensions of Staff and Facility were adopted from Alexandris, Zahariadis, Tsorbatzoudis, and Grouios (2004). The items of Staff (6 items) were "Respond quickly to consumers' requirements," "Work enthusiastically," "Are polite," "Are reliable," "Are knowledgeable," and "Provide individualized attention." Next, the items of Facility (4 items) were "Equipment is in good condition," "The atmosphere in the facility is nice," "Facility is clean," and "Facility has up-to-date equipment." These service quality scales revealed satisfactory factor loading scores: (a) six items of staff ranged 0.68 to 0.79 and (b) four items of facility ranged from 0.53 to 0.77, showing good model fit ($X^2/df=1.38$, $RMSEA=.056$, $NNFI=.951$, $CFI=.959$) (Alexandris et al., 2004).

Perceived Value

Perceived value is important in understanding consumer behaviors in service industries (Cronin et al., 2000; McDougall & Levesque, 2000; Murray & Howat, 2002; Petrick et al., 1999; Shukla, 2010; Yu et al., 2014; Zeithaml, 1988). The concept of

perceived value has been developed from previous researchers as: (a) "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given" (Zeithaml, 1988, p.14), (b) the difference between cost and benefit (Yu et al., 2014), and (c) "benefits received relative to costs" (McDougall & Levesque, 2000, p.393). Thus, perceived value could be described as price or cost of a product or service. Based on the previous literature, the dimension of perceived value had 4 items (7-point Likert-type scale). Those were "Is reasonably priced," "Offers high value for money," "Is a good product for the price," and "Would be economical." A confirmatory factor analysis of the previous research (Sweeney & Soutar, 2001) showed a satisfactory reliability score ($\alpha = .90$) which was greater than .70 (Nunnally & Bernstein, 1994) for perceived value, and factor loadings of the four items ranged from .76 to .85.

Consumer Satisfaction

A satisfied customer tends to be a loyal customer (Fornell, 1992), therefore understanding customer consumption experiences is imperative. Previous research (Murray & Howat, 2002; Howat et al., 1999; McDougall & Levesque, 2000; Yu et al., 2014) has argued that satisfaction was the most significant value in a consumer's entire decision making process. From that marketing standpoint, this current study examined consumer satisfaction of virtual golf in combination with other factors (service quality, perceived value, and behavioral intentions). The consumer satisfaction dimension was comprised of 4 items (7 point Likert-type scale) proposed by Ko and Pastore (2007) with little modifications for this study. Those were "I am satisfied with my decision to play virtual golf," "I am happy about my decision to play virtual golf," "I believe I did the right thing when I decided to play virtual golf," and "Overall, I am satisfied with my

decision to play virtual golf." The previous research (Ko & Pastore, 2007) showed a satisfactory Cronbach's alpha score for consumer satisfaction ($\alpha = .91$) (Nunnally & Bernstein, 1994), and factor loadings of the four items ranged from .79 to .96, indicating strong evidence of the validity and reliability on the satisfaction scale.

Behavioral Intentions

In addition to service quality, perceived value, and consumer behavior, the survey in this study included items measuring behavioral intentions. The ultimate objective of the service industry might be to satisfy consumers with high service quality and reasonable rates, and to have a favorable relationship with them, resulting in consumers purchasing a product or service (behavioral intentions).

The dimension of behavioral intentions including 3 items (9 point Likert-type scale) developed by Cronin et al. (2000) were "The probability that I will use this facility's services again is," "The likelihood that I would recommend this facility's services to a friend is," and "If I had to do it over again, I would make the same choice." The previous research showed that the parameter estimated ranged 0.78 to 0.87 with a construct reliability of 0.87, and an average variance extracted of 68%.

Golfographic and Demographic information

Demographic variables were utilized to better understand leisure constraints relative to consumers of virtual golf. The demographic information included age, gender, marital status, education level, and household income. Furthermore, mastery was included as a golfographic variable. Golfographics include mastery, years of play, golf trips taken, golf membership, and frequency of playing (Oliver, 1980; Petrick et al., 1999; Williams, 1989; Yun et al., 2010; Zhang, 2007). Mastery was chosen among those

variables in this study because virtual golf was originally invented to encourage beginners to enjoy golf without financial concerns (Choe, 2008). Thus, it would be important to analyze whether the relatively more reasonable rates of virtual golf than those of actual golf have been effective for novices from a marketing perspective. Mastery was measured by respondents' self-reported average scores as low (less than 83), medium (83-97) and high (greater than 97), following the standard of Petrick et al. (1999). The third research question applied household income and mastery as independent variables in order to investigate the relationships of the selected factors with leisure constraints of virtual golf.

Semantic Equivalence

Given the current research investigated Korean consumers who are not fluent in English, bilingual doctoral students in a sport management program were in charge of translating survey questionnaires of the English version into Korean to verify whether each question delivered the equal meaning as the English version. Following the standard of Sousa and Rojjanasrirat (2011), this study performed five steps for semantic equivalence of instruments: (a) translation from English into Korean with two translators (TL1 and TL2), (b) Comparison among TL1, TL2, and the original instrument, (c) back-translation from the preliminary initial translated version of the instrument (PI-TL) into English with two translators (B-TL1 and B-TL2), (d) Comparison among B-TL1, B-TL2, and the original instrument, and (e) Pilot test with bilingual individuals. Translation/back-translation procedure technically ensures a semantic consistency by determining potential translation errors (Choi, Seo, Scott, & Martin, 2010). Foreign researchers, therefore, are needed to conduct the translation process to eliminate the difference between target and

source languages (Usunier, 1998).

Pretesting

Given that it was necessary to ensure the instrument measured what it intends to measure, a series of pretests was conducted with individuals who have special knowledge of the topic in this study in order to confirm the reliability and validity of the instrument (Dillman et al., 2008; Groves, 2004). Three steps – (a) a panel of experts, (b) cognitive interviewing (field test), and (c) a pilot study, proposed by Dillman et al. (2008) were conducted so that each step evaluated what the other steps could not.

In the first step, the survey items were distributed to a panel of experts, including professors and doctoral students in sport management programs, to review the instrument and ensure content validity. This procedure enabled the researcher to identify the potential that unneeded questions were included and necessary questions were not included (Dillman et al., 2008). Furthermore, it was important to review for potential survey errors (e.g., wording or spelling). The next step was a field test, using cognitive interviewing (Dillman et al., 2008), with graduate students in a sport management program to check readability and understandability of the survey. They were also asked about appropriateness of questionnaires and the correctness of the survey instructions in order to identify whether the respondents understood questions as intended and whether the respondents answered questions correctly (Dillman et al., 2008). The last step of the pretesting was a pilot study. This procedure was implemented with the finalized survey questions set during the previous steps of pretesting. Results from the pilot test checked whether the survey items delivered consistent scores. This pilot study will be performed in the Republic of Korea using the same procedure of main study to ensure internal

consistency of the entire survey questionnaires. This pilot study enabled the researcher to determine whether the entire survey will work for the larger study in practice.

Specifically, considering the fact that the pilot study was recommended when new survey questions are applied in a given study (Dillman et al., 2008), the pilot study was essential.

In sum, given that the pretesting is a preliminary research procedure to check the entire instrument from various perspectives; this study implemented pretesting with three steps suggested by Dillman et al. (2008).

Data Analysis

This study applied (a) a set of paired samples of t tests, (b) a series of Multivariate Analysis of Variance (MANOVA), and (c) Structural Equation Modeling (SEM) to address five research questions. Before conducting those multivariate analyses, the researcher conducted an Exploratory Factor Analysis (EFA) and calculated Cronbach's alphas to ensure reliability of the scores from the instruments (leisure constraints, service quality, perceive value, consumer satisfaction, and behavioral intentions) in the instrument. This research followed suggestions of Nunnally and Berstein (1994) requiring a minimum threshold of .70 for internal consistency reliability using Cronbach's alpha levels.

Exploratory Factor Analysis

To test the factor structure of the instrument, an Exploratory Factor Analysis using a principal component analysis (PCA) with orthogonal rotation (Varimax) was performed in this study. When a researcher does not have a hypothesis about the nature of the factors measured by a given test, exploratory factor analysis is usually conducted in the early stages of research in order to stabilize variables and generate hypotheses (Fields, 2009).

The main uses of this statistical technique were (a) to understand the structure of variables, (b) to establish survey questions to measure variables, and (c) to reduce data set and to retain original variable to be more manageable (Fields, 2009).

Before applying the EFA, four assumptions were checked: (a) sample size, (b) multivariate normality, (c) linearity, and (d) outliers among variables (Stevens, 2009). First, the minimum sample size for the factor analysis was 200 (Stevens, 2009). Next, the assumption of multivariate normality was verified from histogram using SPSS. Additionally, the assumption of linearity among pairs of variables was also checked from scatterplots using SPSS. Last, outliers with a low squared multiple correlation with all other variables and low correlations with all important factors were removed. In addition to these assumptions, the Kaiser Meyer-Olkin measure verified the sample adequacy for the analysis, and Barlett's test of sphericity checked whether the correlations between items were sufficient.

After performing prerequisite tests, principal component analysis (PCA) was applied based on criteria for deciding on how many components to retain: (a) eigenvalue greater than 1.0, (b) parallel analysis, and (c) the amount of total variance explained by factors (greater than 70%) (Stevens, 2009).

A Set of Paired Samples of *T*-Tests

Research question 1. To address the first research question (i.e., What are the differences in constraints between participation in actual golf and virtual golf?), a set of paired samples of *t* tests was conducted to investigate constraint differences based on types of golf. Given that *t* test is an appropriate statistical technique comparing two means with same participants (Field, 2009), all survey respondents in this study

completed two types of surveys (i.e., actual golf and virtual golf). Thus, the independent variable was type of golf, and dependent variable was each leisure constraint. Based on the result of EFA performed at the first stage of main analysis, the number of dependent variables was changed.

Prior to application of a set of t tests in this analysis, three assumptions were checked. First, the dependent variable was measured at the continuous level (i.e., leisure constraints). Next, the independent variable consisted of two related groups which meant same participants in each group (i.e., actual golf and virtual golf). Lastly, the distribution of the differences of the dependent variable between groups should be normal, using SPSS statistics.

A Series of Multivariate Analysis of Variance

To address the second, third, and fourth research questions, [i.e., Which constraints differ between experienced and non-experienced golfers participating in virtual golf?, How do constraints differ among household income levels (high, medium, and low) in participating in virtual golf?, and How do constraints differ among mastery levels (master, advanced, intermediate, and beginner) in participating in virtual golf?], a series of MANOVAs was implemented, investigating leisure constraint differences among sampling groups based on individuals' golf experiences. MANOVA is a statistical technique to investigate group differences on more than one dependant variable (Field, 2009). Furthermore, when there are significant results in the multivariate analyses, univariate analyses will be performed to determine where the significance exists.

Prior to application of a series of MANOVA in this study, checking three assumptions (independence, normality, and equality of covariance) is a prerequisite. First,

considering that the assumption of independence means that "the observations should be statistically independent" (Field, 2009, p.603), each respondent in this study completed only one survey independently. That is, each score was independently obtained, and the scores were not influenced by other people in the sample. The next assumption is normality, which means "the observations are normally distributed in each group" (Stevens, 2009, p.221). The frequency distribution (histogram) was used to test the assumption of normality visually in this study. Last, the assumption of homogeneity of covariance, which means covariances across groups should be equal (Field, 2009). The F statistic generated from Box's test was used for checking this assumption in this study.

Research question 2. To address the second research question (i.e., Which constraints differ between experienced and non-experienced golfers participating in virtual golf?), a two-group MANOVA was implemented to examine constraint differences based on golf experiences of respondents. Two sample groups (experienced and non-experienced in virtual golf) completed surveys developed for investigation of constraints in virtual golf. Accordingly, the independent variable was type of golf experience, and the dependent variable was leisure constraints.

Research question 3. To address the third research question [i.e., Which constraints differ among household income levels (high, medium, and low) in participating in virtual golf?], a three-group MANOVA was applied to explore differences in leisure constraints, depending upon household income levels in virtual golf. The survey respondents with experiences in virtual golf were classified into three categories as high, medium, and low. Income categories were classified as high (KRW 75 million or more), medium (KRW 50 million to KRW 75 million), and low (less than KRW 50

million).

Research question 4. To address the fourth research question [Which constraints differ among mastery levels (master, advanced, intermediate, and beginner) in participating in virtual golf?], a four-group MANOVA was performed to examine differences of leisure constraints depending on individual's mastery levels in virtual golf. The participants with experiences in virtual golf were divided into four groups as master, advanced, intermediate, and beginner. Mastery categories were classified by respondents' self-reported average scores as low (less than 83), medium (83-97) and high (greater than 97), following the standard of Petrick et al. (1999).

Structural Equation Modeling

Research question 5. To address the fifth research question, (What are the structural relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions in virtual golf?), a structural equation modeling (SEM) was conducted to test measurement model and the structural model. When a researcher focuses on examining complex relationships among constructs, a structural equation modeling (SEM) is appropriate with a confirmatory approach (Kline, 2005).

Given that researchers may want to investigate complicated relationships among various constructs in terms of consumer behaviors (i.e., service quality, perceived value, consumer satisfaction, and behavioral intentions), structural equation modeling (SEM) has been used in sport industry research (Kim, Kim, Park, Yoo, & Kwon, 2014; Ko, Zhang, Cattani, & Pastore, 2011; Suh, Ahn, & Pedersen, 2013). Given that the current research investigated consumer behaviors of virtual golf, which has had little attention so far, a structural equation modeling (SEM) could be an appropriate statistical procedure

examine their consumption propensities. Specifically, service quality and perceived value were exogenous variables (independent variable), and consumer satisfaction and behavioral intentions were endogenous variables (dependent variable). Consumer satisfaction will be both a cause and an effect variable (i.e., mediator). Also, the variable service quality included two sub-dimensions: (a) staff and (b) facility in this structural model.

For assessing the fit of the hypothesized model using AMOS 22.0, the researcher generated (a) chi-squared test, (b) the comparative fit index (CFI), (c) normed fit index (NFI), and (d) root mean square error of approximation (RMSEA) as suggested by Hu and Bentler (1999), Kenny (2011), and Kline (2005). Chi-square test value greater than .05 alpha value indicated a good-fitting model between the model and the observed data. Next, from the comparison between observed data and the proposed model, the value of CFI and NFI exceeding .90 were an acceptable fit (Byrne, 1998; Hu & Bentler, 1999). Last, RMSEA examined the discrepancy between the sample coefficients and the model coefficient through the error of approximation, based on a suggestion of Loehlin (2004) indicating a good fit (less than .08), a moderate fit (between .08 and .1), and a poor fit (greater than .1). The SEM in this study followed those statistical criteria to specify the hypothesized structural model.

Summary of Method

In summary, the current study investigated participation constraints and consumer behavior in virtual golf with individuals from the Republic of Korea who were classified by their types of golf experiences. Prior to data collection, a series of pretests (i.e., a panel of experts, a field test, and a pilot study) were administered to ensure the

reliability, validity, and readability of the instrument. Surveys were collected through an intercept data collection technique with respondents, using stratified sampling, purposive sampling, and convenience sampling. The survey questions focused on (a) leisure constraints, (b) selected factors (i.e., mastery and household income), (c) service quality, (d) perceived value, (e) consumer satisfaction, and (f) behavioral intentions. To analyze the obtained data, the researcher performed (a) a set of paired samples of *t* tests, (b) a series of Multivariate Analysis of Variance (MANOVA), and (c) Structural Equation Modeling (SEM) to address five research questions.

CHAPTER IV

RESULTS

The purpose of this study was to understand virtual golf, an emerging sport-related business for the next generation. Specifically, this study aimed a) to investigate differences of golfers' constraints between participation in actual golf and virtual golf, b) to compare constraints between experienced and non-experienced individuals in virtual golf, c) to examine effects of household income on constraints in virtual golf, d) to examine effects of mastery on constraints in virtual golf, and (e) to explore relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions in virtual golf.

Data was collected from individuals who have awareness about actual golf and virtual golf in the Republic of Korea. Study participants responded to a paper-based or an online-based survey focusing on (a) leisure constraints, (b) service quality, (c) perceived value, (d) consumer satisfaction, (e) behavioral intentions, and (f) golfographic and demographic information in virtual golf. In order to answer the research questions, different statistical analyses were performed: (a) a set of paired samples of *t* tests, (b) a series of Multivariate Analysis of Variance (MANOVA), and (c) Structural Equation Modeling (SEM). Results of all analyses in this study were followed below.

Scale Validation

To ensure that the instrument measured what it intended to measure, a series of pretests were performed to confirm the reliability, validity, and readability of the

instrument. Three steps, (a) a panel of experts, (b) field test, and (c) a pilot study proposed by Dillman et al. (2008), were conducted so that each step evaluated what the other steps could not.

Panel of Experts

As the first step of instrument pretests, the survey with a brief explanation of the current study was distributed to several doctoral students and professors in sport management at Midwestern U.S. universities in order to get feedbacks in terms of content validity and readability. Basically, few minor modifications (i.e., wording) were applied with the panel of experts. One of the experts suggested changing two terms (i.e., actual golf and virtual golf) to better ones for survey respondents to understand. Based on the comment, the term "actual" was deleted because "golf" would be more general term than "actual golf". Also, the term "virtual golf" was modified to screen golf because virtual golf has been called "screen golf" in the Republic of Korea where this survey will be performed. Also, the expert indicated that some changes could be necessary under demographic and golfographic information. More specifically, a question, "What is your average golf score?" was added to investigate mastery of consumers in golf, and the number of categories under household income was increased from three to five. These changes would enable the researcher to have detailed information related to consumers in the golf industry. Another expert indicated that the term "time commitment" would be confusing to the survey respondents because it might not be general term. So, it was modified to "time" to increase understandings of participants. In addition, given that two doctoral students belonged to the panel of experts suggested to add a brief description of actual and virtual golf, a letter including additional explanation was added with survey

questions. Last, a professor in sport management field suggested to delete a question under the weather dimension in leisure constraints to increase the instrument reliability: the question "I like to play golf in nice weather" might be in opposition to the rest of items in the dimension of weather. The deleted question (affirmative statement) might significantly affect instrument reliability composed of negative statements.

Field Test

Following the reviews of experts, a field test was conducted by interviews (Dillman, 2007) via telephone with five graduate students in a sport management program who were fluent in both English and Korean. Also, they were not involved in the main study of this research and had experiences in golf and virtual golf in the Republic of Korea. Prior to all interviews, all participants in this field test were instructed about the study purpose and research direction, and the researcher asked the participants to detect errors regarding wording, formatting, or question order. All procedures to complete survey questions in this field test were conducted equally with the main study. In addition to few minor modifications, a graduate student indicated that a question under the dimension of consumer satisfaction: "Overall, I am satisfied with my decision to play screen golf" was duplicated with another question. Thus, to avoid redundancy, the question was deleted. Also, based on a suggestion from another graduate student, the number of mastery categories under golfographic information was expanded from three to four. Furthermore, all graduate students in this field test indicated it was necessary to modify the question: "How frequently do you play golf per week?" to get more discernment, because people commonly tend to play golf on weekends. Thus, the question was modified: "How frequently do you play golf per a month?" Lastly, through

several discussions about suitability of survey questions in virtual golf environment, an item under the dimension of facility, "Facility has up-to-date equipment" was deleted in that most customers bring their own golf clubs, and the golf simulators are updated regularly at the company level. These changes would allow the researcher to have better information regarding consumer behaviors through the data collection.

Pilot Study

With the survey instrument modified by the panel of experts and the field test, a pilot study was performed through internet-based surveys to ensure scale reliability 10 days prior to the actual data collection of main study. Based on equal research conditions (i.e., sampling and data collection procedure) with the main study, a survey link of Qualtrics.com was distributed through emails and mobile phone text messages to individuals who were not involved in this study and had experiences in actual and virtual golf in the Republic of Korea. For a week, 91 surveys (62 useably completed surveys) were collected through Qualtrics.com from this pilot study.

Based on the recommended statistic standard about internal consistency from Nunnally and Bernstein (1994) that Cronbach's alpha estimates were greater than .70 to be acceptable, the scale reliability was estimated in each golf context (i.e., actual and virtual golf) for seven leisure constraints (i.e., social, health, skill, confidence, cost, weather, and time) and five consumer behaviors (i.e., staff, facility, perceived value, consumer satisfaction, and behavioral intentions), using Cronbach's alpha coefficients (Table 4). In an actual golf context, for the seven leisure constraints, alphas ranged from .716 to .889 including social ($\alpha = .716$), health ($\alpha = .748$), skill ($\alpha = .889$), confidence ($\alpha = .885$), cost ($\alpha = .743$), weather ($\alpha = .717$), and time ($\alpha = .855$). In a virtual golf context, for the seven

leisure constraints, alphas ranged from .808 to .955 including social ($\alpha = .808$), health ($\alpha = .864$), skill ($\alpha = .837$), confidence ($\alpha = .876$), cost ($\alpha = .876$), weather ($\alpha = .955$), and time ($\alpha = .859$). For the five consumer behaviors, alpha ranged from .756 to .926 including staff ($\alpha = .756$), facility ($\alpha = .778$), perceived value ($\alpha = .844$), consumer satisfaction ($\alpha = .881$), and behavioral intentions ($\alpha = .926$). All Cronbach's alpha estimates exceeded the .70 cutoff for good internal consistency reliability (Nunnally & Bernstein, 1994).

Table 4
The Cronbach's Alpha Estimates of the Pilot Study (English)

Scale	# of Items	Alpha	
		Actual	Virtual
Social	3	.716	.808
Health	3	.748	.864
Skill	3	.889	.837
Confidence	5	.885	.876
Cost	4	.743	.876
Weather	3	.717	.955
Time	3	.855	.859
Staff	6	-	.756
Facility	3	-	.778
Perceived Value	4	-	.844
Consumer Satisfaction	3	-	.881
Behavior Intentions	3	-	.926

Translation and Back-translation

After performing three steps of the pretest, to collect data from Korean consumers who were not fluent in English, the translation/back-translation technique was performed prior to the main research of this study. A panel of experts consisting of bilingual doctoral students and faculty members in the Mideast universities was in charge of translating the survey to verify semantic equivalence between two language versions. Six steps of instrument translation referring to the standard suggested by Sousa and Rojjanasrirat (2011) were conducted: (a) the original language (English) was translated to the target

language (Korean) with two bilingual and bicultural translators (TL1 & TL2), (b) the third translator compared TL1 and TL2 with the original survey (TL3), (c) The translated survey (TL3) was back-translated to the original language with two bilingual and bicultural translators (B-TL1 & B-TL2), (d) the fifth translator compared B-TL1 and B-TL2 with the original survey (pre-final TL), (e) a panel of experts reviewed the pre-final TL, and (f) a pilot study using pre-final TL with individuals from the target population of this study was conducted (final version of the instrument). Each translator in a certain step was not involved with other steps of the translation.

The panel of experts suggested to add more detailed instruction on each page so that survey participants can determine what was to be completed precisely and which group they should belong to. Specifically, given that this study will compare various sample groups based on their golf experiences once data is collected, it was definitely necessary for respondents to understand what exactly they will be doing. Thus, brief instructions on each page were added, and few minor modifications were applied.

After performing the translation, 102 surveys (77 of which were useably completed) were collected from the target population of this study through Qualtrics.com for 15 days. The scale reliability was estimated from completed surveys (final version in Korean) (Table 5). In an actual golf context, alphas for the seven leisure constraints ranged from .782 to .947 including social ($\alpha = .899$), health ($\alpha = .947$), skill ($\alpha = .782$), confidence ($\alpha = .932$), cost ($\alpha = .918$), weather ($\alpha = .842$), and time ($\alpha = .814$). In a virtual golf context, alphas for the seven leisure constraints ranged from .764 to .969 including social ($\alpha = .764$), health ($\alpha = .956$), skill ($\alpha = .769$), confidence ($\alpha = .945$), cost ($\alpha = .940$), weather ($\alpha = .969$), and time ($\alpha = .904$). For the five consumer behaviors,

alphas for the five consumer behaviors ranged from .896 to .929 including staff ($\alpha = .914$), facility ($\alpha = .893$), perceived value ($\alpha = .896$), consumer satisfaction ($\alpha = .929$), and behavioral intentions ($\alpha = .925$). The same as the result of the pilot test in English version did, all Cronbach's alpha estimates exceeded the .70 cutoff for acceptable internal consistency reliability (Nunnally & Berstein, 1994).

Table 5
The Cronbach's Alpha Estimates of the Pilot Study (Korean)

Scale	# of Items	Alpha	
		Actual	Virtual
Social	3	.899	.764
Health	3	.947	.956
Skill	3	.782	.769
Confidence	5	.932	.945
Cost	4	.918	.940
Weather	3	.842	.969
Time	3	.814	.904
Staff	6	-	.914
Facility	3	-	.893
Perceived Value	4	-	.896
Consumer Satisfaction	3	-	.929
Behavior Intentions	3	-	.925

With sufficient Cronbach's alpha coefficients, no survey items were eliminated to measure individuals' leisure constraints and consumer behaviors in virtual golf. Finally, the final surveys were distributed to several bilingual doctoral students in sport management in order to read through the questionnaires for "final check".

Sample Statistics

After the scale validation through three pretests, main sample data of this study was collected from individuals who have various experiences about actual golf and virtual golf in the Republic of Korea in October and November 2015. A total of 550 surveys were distributed, and 412 surveys were returned (approximately 74.9% of response rate). Among them, 252 surveys (61.1%) were completed via online format, and

the rest of the 160 surveys (38.8%) were collected via paper-based format. After excluding 23 incomplete surveys, a total of 389 surveys were utilized in this study. The completed usable 389 surveys met the criteria of minimum sample size to avoid sampling error for a population of 1,000,000 for a 95% confidence level with less than 5% sampling error. (Dillman et al., 2008). Furthermore, the sample size collected in this study satisfied requirements on each statistic technique of five research questions: over 100 subjects for *t* test and multivariate analysis of variance (MANOVA) (Stevens, 2009) on RQ1, 2, 3, and 4, and over 200 subjects for a structural equation modeling (Garver & Mentzer, 1999) (SEM) on RQ5 performed in this study. Thus, the sample in the current study exceeded those recommendations.

Demographic Information

The sample consisted of 300 (77.1%) males and 89 (22.9%) females. The respondents' ages ranged from 19 to 75 years old with an average age of 40 year old ($M = 40.03$, $SD = 12.86$). In addition, 59.1% ($n = 230$) of the sample was between the ages of 21 and 39 year old. In regard to marital status, 139 (35.5%) were single, 239 (61.4%) were married, and 12 (3.1%) were either divorced or widowed. In relation to participants' highest level of education completed, a majority of survey participants had a Bachelor's degree ($n = 234$, 60.2%), followed by a master's degree ($n = 87$, 22.4%), a high school degree ($n = 56$, 14.4%), and a doctorate degree ($n = 12$, 3.1%). There were no participants with an elementary school or a middle school degree in this study. Additionally, participants reporting an annual household income between KRW 50 million and KRW 75 million comprised 27.5% ($n = 107$) of the total sample. The second largest group in the annual household was more than KRW 100 million ($n = 88$, 22.6%), followed by

KRW 25 million to KRW 50 million ($n = 82$, 21.1%), less than KRW 25 million ($n = 60$, 15.4%) and KRW 75 million to KRW 100 million ($n = 52$, 13.4%). A complete frequency distribution of demographic variables is presented in Table 6.

Table 6
Frequency of Distributions for Demographic Variables

Variables	Percentage	<i>N</i>
Gender		
Male	77.1	300
Female	22.9	89
Age		
Under 21	1.5	6
21 - 29	16.2	63
30 - 39	42.9	167
40 - 49	13.9	54
50 - 59	11.1	43
60 - 69	13.6	53
70+	0.8	3
Marital/household status		
Single	35.5	139
Married	61.4	239
Divorced	2.6	10
Widowed	0.5	2
Highest level of education completed		
Elementary school	0	0
Middle school	0	0
High school	14.4	56
Bachelor's degree	60.2	234
Master's degree	22.4	87
Doctorate degree	3.1	12
Annual household income (Unit: KRW 10,000)		
Less than KRW 2,499	15.4	60
From KRW 2,500 to KRW 4,999	21.1	82
From KRW 5,000 to KRW 7,499	27.5	107
From KRW 7,500 to KRW 9,999	13.4	52
More than KRW 10,000	22.6	88

Golfographic Information

All survey participants responded to a question about their golf experiences in actual and virtual golf, and the answers were the criteria to determine who belonged to each research category. In regard to golf experience, 166 (42.7%) of the participants were

experienced in both actual and virtual golf, and 109 (28.0%) of the participants were not experienced in either actual or virtual golf. In addition, 71 (18.3%) had experiences in only actual golf, and 43 (11.1%) had experiences in only virtual golf.

In relation to frequency of playing golf per month, a majority of the participants reported less than once ($n = 145$, 37.3%) or no experience ($n = 122$, 31.4%), followed by one or two times ($n = 71$, 18.3%), three or four times ($n = 38$, 9.8%), and more than five times ($n = 13$, 3.3%). Similarly, in frequency of playing virtual golf per month, a majority of the participants reported less than once ($n = 166$, 42.7%) or no experience ($n = 163$, 41.9%), followed by one or two times ($n = 45$, 11.6%), three or four times ($n = 9$, 2.3%), and more than five times ($n = 6$, 1.5%). In regard to average scores in actual golf, participants reporting that "I don't know" comprised 41.1% ($n = 160$) of the total sample, followed by greater than 100 ($n = 74$, 19.0%), between 91 and 99 ($n = 73$, 18.8%), between 82 and 90 ($n = 58$, 14.9%), and less than 81 ($n = 24$, 6.2%). Additionally, participants reporting that "I don't know" comprised 48.6% ($n = 189$) of the total sample, followed by between 82 and 90 ($n = 63$, 16.2%), greater than 100 ($n = 50$, 12.9%), between 91 and 99 ($n = 49$, 12.6%), and less than 81 ($n = 38$, 9.8%). Complete frequency distribution of golfographic variables are presented in Table 7.

Table 7
Frequency of Distributions for Golfographic Variables

Variables	Percentage	<i>N</i>
Golf experience		
Only played golf on an outdoor course	18.3	71
Only played screen golf	11.1	43
Both	42.7	166
Neither	28.0	109
Frequency of playing golf per month		
More than five times	3.3	13
Three or four times	9.8	38
One or two times	18.3	71

Less than once	37.3	145
No experience	31.4	122
Frequency of playing screen golf per month		
More than five times	1.5	6
Three or four times	2.3	9
One or two times	11.6	45
Less than once	42.7	166
No experience	41.9	163
Average score in golf		
Less than 81	6.2	24
82 - 90	14.9	58
91 - 99	18.8	73
Greater than 100	19.0	74
I don't know	41.1	160
Average score in screen golf		
Less than 81	9.8	38
82 - 90	16.2	63
91 - 99	12.6	49
Greater than 100	12.9	50
I don't know	48.6	189

Exploratory Factor Analysis

Data in this study was analyzed using SPSS 22.0 to understand the structure of variables for leisure constraints in two contexts and consumer behaviors in virtual golf. Before conducting the EFA, four assumptions were checked: (a) sample size, (b) normality (*Q-Q* plot), (c) linearity, and (d) outliers among the variables. Furthermore, three criteria were applied to determine the number of factors to retain: (a) eigenvalue greater than 1.0, (b) parallel analysis, and (c) the amount of total variance explained by factors (greater than 70%) (Stevens, 2009). The following section explored the factor structure of leisure constraints in actual and virtual contexts and consumer behaviors in virtual golf by performing three separate EFAs.

Factor Structure of Leisure Constraints in Actual Golf

The first exploratory factor analysis using a principal component analysis (PCA) with orthogonal rotation (Varimax) of leisure constraints in actual golf (24 items) was

conducted. The Kaiser Meyer-Olkin measure verified the sample adequacy for the analysis, KMO = .838, exceeding the criteria (.70) (Field, 2009). Barlett's test of sphericity ($\chi^2 = 5688.738$, $df = 276$, $p < .001$) was statistically significant, indicating that the correlations between items were sufficient. The extracted communalities were generated to reflect the proportion of variance explained by the retained factors, and the values ranged from .522 to .832 exceeding the criteria (.40) (Stevens, 2009). Six factors, explaining 71% of total variance, were retained. The first factor, accounting for 29% of the variance, combined all items of confidence (5 items) and skill (3 items). As such, the combined factor was newly named "skill/confidence". The rest of items maintained initial factor structures without changes: (a) cost (4 items), (b) social (3 items), (c) weather (3 items), (d) time (3 items), and (e) health (3 items). The detailed information is presented in Table 8.

Table 8
Factor Structure Matrix for Leisure Constraints in Actual Golf

Constraints	Factors						h^2
	Skill/ Confidence	Cost	Social	Weather	Time	Health	
Inadequate	0.86						0.79
Frustrated easily	0.85						0.77
Not a good golfer	0.84						0.77
Not very good	0.83						0.73
Fear embarrassing	0.78						0.71
Too inconsistent	0.69						0.58
Not experienced	0.68						0.52
Too difficult	0.58						0.69
Expensive equipment		0.87					0.83
Expensive cost		0.85					0.77
Cannot afford		0.85					0.82
Not enough money		0.76					0.71
Not want me to play			0.83				0.76
Different interests			0.73				0.61
No friends			0.64				0.52
Rainy weather				0.86			0.78

Cold weather				0.85		0.79
Hot weather				0.70		0.58
No time					0.84	0.79
Difficult to find time					0.80	0.74
Long time					0.64	0.61
No energy						0.86 0.80
Not fit enough						0.85 0.82
Health problems						0.71 0.61
Eigenvalues	7.02	3.23	2.16	1.95	1.54	1.29
% of Variance	29.25	13.51	9.00	8.14	6.43	5.40

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

Factor Structure of Leisure Constraints in Virtual Golf

The second exploratory factor analysis using a principal component analysis (PCA) with orthogonal rotation (Varimax) of leisure constraints in virtual golf (24 items) was performed. The Kaiser Meyer-Olkin measure verified the sample adequacy for the analysis, KMO = .870, exceeding the criteria (.70) (Field, 2009). Barlett's test of sphericity ($\chi^2 = 7683.095$, $df = 276$, $p < .001$) was statistically significant, indicating that the correlations between items were adequate. The extracted communalities were generated to reflect the proportion of variance explained by the retained factors, and the values ranged from .511 to .888, exceeding the criteria (.40) (Stevens, 2009). Six factors, explaining 76% of total variance, were retained. The first factor, accounting for 36% of the variance, combined all items of confidence (5 items) and skill (3 items). As the factor structure of leisure constraints in actual golf did, the combined factor was newly named "skill/confidence". Furthermore, the rest of items also maintained initial factor structures without changes: (a) cost (4 items), (b) social (3 items), (c) weather (3 items), (d) time (3 items), and (e) health (3 items). The detailed information is presented in Table 9.

Table 9

Factor Structure Matrix for Leisure Constraints in Virtual Golf

Constraints	Factors						h^2
	Skill/ Confidence	Weather	Cost	Health	Time	Social	
Inadequate	0.88						0.84
Not very good	0.86						0.81
Not a good golfer	0.86						0.80
Too difficult	0.81						0.73
Too inconsistent	0.80						0.68
Not experienced	0.77						0.76
Frustrated easily	0.77						0.75
Fear embarrassing	0.67						0.69
Cold weather		0.89					0.88
Hot weather		0.86					0.87
Rainy weather		0.75					0.80
Cannot afford			0.82				0.84
Not enough money			0.81				0.84
Expensive cost			0.71				0.79
Expensive equipment			0.70				0.80
No energy				0.87			0.82
Health problems				0.78			0.74
Not fit enough				0.55			0.51
No time					0.85		0.86
Long time					0.84		0.84
Difficult to find time					0.69		0.69
Different interests						0.81	0.72
No friends						0.75	0.64
Not want me to play						0.69	0.66
Eigenvalues	8.70	3.51	2.06	1.56	1.48	1.13	
% of Variance	36.25	14.64	8.60	6.52	6.19	4.74	

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

Factor Structure of Consumer Behaviors in Virtual Golf

The last exploratory factor analysis using a principal component analysis (PCA) with orthogonal rotation (Varimax) of consumer behaviors in virtual golf (19 items) was implemented. The Kaiser Meyer-Olkin measure verified the sample adequacy for the analysis, KMO = .864, exceeding the criteria (.70) (Field, 2009). Barlett's test of sphericity ($\chi^2 = 3013.057$, $df = 171$, $p < .001$) was statistically significant, indicating that

the correlations between items were adequate. The extracted communalities were generated to reflect the proportion of variance explained by the retained factors, and the values ranged from .597 to .894, exceeding the criteria (.40) (Stevens, 2009). Five factors, explaining 76% of total variance, were retained.

The first factor, accounting for 40% of the variance, included three items in each of staff and facility. For example, "Provide individualized attention" from staff constraints and "Equipment is well-maintained" from facility constraints were included in this first factor. However, two items, "Atmosphere" and "Clean", with the lowest coefficients were additionally deleted to have stronger factor structure even if all six items had factor structure coefficients greater than .40. The additional item reduction was able to be conducted in that the factor (core service) already retained a sufficient number of items (4 items). Given that the items reflected pivotal aspects of service quality in a virtual golf center, this factor was named "core service". The second, third, and fourth factor maintained the initially designed factor structures in this study: (a) perceived value, (b) behavior intentions, and (c) consumer satisfaction. Thus, these three factors were not changed. The last fifth factor was composed of three items from staff, including "Respond quickly to consumers' requirements", "Work enthusiastically" and "Are polite". Given that the items showed subjective and personal aspects of service quality in a virtual golf center, this factor was named "peripheral service". The detailed information is presented in Table 10.

Table 10
Factor Structure Matrix for Consumer Behaviors in Virtual Golf

Consumer Behaviors	Factors					h^2
	Core Service	Perceived Value	Behavioral Intentions	Consumer Satisfaction	Peripheral Service	
Attention	0.83					0.73

Knowledgeable	0.82				0.76
Reliable	0.78				0.72
Well-maintained	0.76				0.70
Atmosphere	0.58				0.63
Clean	0.50				0.65
Good service		0.82			0.77
Reasonably		0.80			0.76
High value		0.78			0.71
Economical		0.66			0.59
Recommend			0.85		0.87
Same choice			0.82		0.89
Use again			0.81		0.87
Right thing				0.82	0.84
Satisfied decision				0.81	0.85
Happy				0.78	0.85
Respond quickly					0.90 0.84
Enthusiastically					0.85 0.78
Polite					0.66 0.66
Eigenvalues	7.69	2.64	1.75	1.42	1.02
% of Variance	40.51	13.93	9.25	7.51	5.39

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

Instrument Reliability

The current study applied leisure constraints scales in two golf contexts (actual and virtual golf), and consumer behavior scales in virtual golf. All survey items under those scales adapted from previous literature were showed to be reliable. Furthermore, through two pilot studies, the survey items in this study showed acceptable results of instrument reliability. However, given that the factor structure was reconstructed through the exploratory factor analysis, an additional reliability analysis was performed.

In the actual golf context , alphas for the six leisure constraints ranged from .739 to .920 including social ($\alpha = .739$), health ($\alpha = .755$), skill/confidence ($\alpha = .920$), cost ($\alpha = .888$), weather ($\alpha = .795$), and time ($\alpha = .803$). In virtual golf context , alphas for the six leisure constraints ranged from .732 to .936 including social ($\alpha = .732$), health ($\alpha = .795$), skill/confidence ($\alpha = .936$), cost ($\alpha = .879$), weather ($\alpha = .918$), and time ($\alpha = .880$). For

the five consumer behaviors, alpha ranged from .777 to .948 including core service ($\alpha = .880$), peripheral service ($\alpha = .777$), perceived value ($\alpha = .867$), consumer satisfaction ($\alpha = .924$), and behavioral intentions ($\alpha = .948$). All Cronbach's alpha estimates exceeded the .70 cutoff for good internal consistency reliability (Nunnally & Bernstein, 1994).

Complete internal consistency reliability estimates are presented in Table 11.

Table 11
The Cronbach's Alpha Estimates of the Main Study

Scale	# of Items	Alpha	
		Actual	Virtual
Social	3	.739	.732
Health	3	.755	.795
Skill/Confidence	8	.920	.936
Cost	4	.888	.879
Weather	3	.795	.918
Time	3	.803	.880
Service Quality			
Core	4	-	.880
Peripheral	3	-	.777
Perceived Value	4	-	.867
Consumer Satisfaction	3	-	.924
Behavior Intentions	3	-	.948

Descriptive Statistics

As well as demographic and golfographic variables, descriptive statistics of dependent variables were also examined after restructuring factors through EFAs. The scale items were estimated on a 7-point Likert-type scale (1 = *strongly disagree* and 7 = *strongly agree*). The dimension of leisure constraints consisted of six items in two golf contexts (i.e., actual and virtual golf): social ($M = 3.05$, $SD = 1.41$), health ($M = 2.56$, $SD = 2.33$), skill/confidence ($M = 3.90$, $SD = 1.52$), cost ($M = 4.19$, $SD = 1.59$), weather ($M = 4.93$, $SD = 1.41$), and time ($M = 4.48$, $SD = 1.44$) in actual golf, and social ($M = 3.01$, $SD = 1.11$), health ($M = 2.58$, $SD = 1.43$), skill/confidence ($M = 3.47$, $SD = 1.54$), cost ($M = 3.21$, $SD = 1.44$), weather ($M = 2.83$, $SD = 1.74$), and time ($M = 3.34$, $SD = 1.48$) in

virtual golf. In addition, the dimensions of service quality, core ($M=4.41$, $SD=1.05$) and peripheral ($M=3.53$, $SD=1.50$), perceived value ($M=4.32$, $SD=1.12$), consumer satisfaction ($M=4.34$, $SD=1.16$), behavioral intentions ($M=4.73$, $SD=1.27$) were generated in this study. Complete descriptive statistics of dependent variables are presented in Table 12.

Table 12
Descriptive Statistics of Dependent Variables

Variables	Mean		SD	
	Actual	Virtual	Actual	Virtual
Leisure Constraints				
Social	3.05	3.01	1.41	1.11
Health	2.56	2.58	2.33	1.43
Skill/Confidence	3.90	3.47	1.52	1.54
Cost	4.19	3.21	1.59	1.44
Weather	4.93	2.83	1.41	1.74
Time	4.48	3.34	1.44	1.48
Service Quality				
Core	-	4.41	-	1.05
Peripheral	-	3.53	-	1.50
Perceived Value	-	4.32	-	1.12
Consumer Satisfaction	-	4.34	-	1.16
Behavioral Intentions	-	4.73	-	1.27

Data Analysis

This study conducted a set of paired samples t tests, a series of MANOVAs, and a structural equation modeling (SEM) to address five research questions. The following section will report detailed results of each research question.

Research Question 1

RQ1: What are the differences in constraints between participation in actual golf and virtual golf??

To address the first research question, this study performed six paired-samples t -tests to compare six leisure participation constraints (i.e., social, health, cost, weather, time, and skill/confidence) as each dependent variable (continuous) in actual and virtual

golf as an independent variable (categorical). Regardless of golf experiences, all survey respondents ($n = 389$) completed two sets of survey which were composed of questions about two different types of golf environments (i.e., actual and virtual golf). A set of paired-samples t -tests was applied to determine whether there were statistically significant mean differences on six leisure constraints when participating in actual and virtual golf. The significant result of Shapiro-Wilk's test ($p < .005$) indicated the assumption of normality was violated. However, the researcher proceeded this analysis because the paired-samples t -test is fairly robust to deviations from normality when sample sizes are large ($n = 389$ in this analysis) (Stevens, 2009).

The set of paired t test found that here were statistically significant mean differences for cost, $t(388) = 13.952$, $p < .001$, weather, $t(388) = 20.533$, $p < .001$, time, $t(388) = 14.046$, $p < .001$, skill/confidence, $t(388) = 8.247$, $p < .001$, but not for social, $t(388) = .515$, $p = .607$, and health, $t(388) = -.382$, $p = .703$. That is, the results indicated that the four constraints (cost, weather, time, and skill/confidence) had greater influences when participating in actual golf than virtual golf.

Table 13
Results of Dependent t-Tests: Differences in Leisure Constraints between Actual and Virtual Golf

Variable	Paired Difference		t	df	Sig.
	M	SD			
Social	.03942	1.50928	.515	388	>.001
Health	-.02228	1.15101	-.382	388	>.001
Cost	.97815	1.38271	13.952	388	<.001*
Weather	2.09083	2.00837	20.533	388	<.001*
Time	1.13796	1.59793	14.046	388	<.001*
Skill/Confidence	.42931	1.02666	8.247	388	<.001*

Research Question 2

RQ2: Which constraints differ between experienced and non-experienced golfers

participating in virtual golf?

To address the second research question, this study performed a two-group MANOVA to compare leisure participation constraints between experienced and non-experienced golfers participating in virtual golf. Participants who have never played golf in either context were involved in this analysis in that one of the purposes in this research question was to investigate leisure constraints of potential consumers. Given that the virtual golf is an emerging sport industry looking for new consumers to expand fan base, the efforts examining potential consumers would be significant. All survey participants responded to a question about their golf experiences in actual and virtual golf (which one of the following golf contexts have you experienced?). The answer from the four choices (i.e., only played golf on an outdoor course, only played screen golf, both, and neither) was the criteria to determine who belonged to each group. For this analysis, the group of experienced golfers included participants who responded "only played screen golf" and "both", and the group of non-experienced golfers was composed of participants who answered "only played golf on an outdoor course" and "neither". Given that this research question focused on perceptions about participation in screen golf, the meaning of the term "experience" in this analysis was the experience in screen golf. Thus, participants who only played in actual golf was classified as non-experienced in screen golf.

Prior to analysis, assumptions were checked: (a) independence, (b) normality, and (c) equality of covariances. First, given that respondents completed the survey independently without duplication, the assumption of independence was fulfilled. Next, showing positively skewed histogram comparing with normal curve, the assumption of normality was violated. However, given that the F statistic (MANOVA) is robust, the

effect of non-normal distribution is very slight (Stevens, 2009). Last, the researcher found statistically significant result on the Box's test of equality of covariance matrices (Box's $M = 145.04$, $F = 6.79$, $p < .01$), violating the third assumption. Stevens (2009) stated that the violation of the homogeneity of covariances do not need to be worried with fairly equal sample sizes between groups, indicating that a group should be no larger than 1.5 the size of another group. In this research question, the sample size of experienced group ($n = 209$) and non-experienced group ($n = 180$) had fairly equal. Furthermore, Field (2009) stated that F statistic is robust against heterogeneous variances. Thus, the researcher proceeded with the analysis. Additionally, the researcher performed Bartlett's Test of Sphericity, and the result was statistically significant ($\chi^2 = 570.03$, $p < .001$), indicating sufficient correlation between the dependent variables.

Then, the multivariate test indicated that there were differences between experienced and non-experienced golfers in virtual golf on the composite dependent variables (i.e., social, health, cost, weather, time, and skill/confidence). For example, the Wilks's lambda was .800 and its $F(6,382) = 15.886$, $p < 0.000$, partial $\eta^2 = .200$. This indicated that 20.0% of the total variance in the dependent variables was accounted for by experience in virtual golf. Because the multivariate test was statistically significant, the researcher proceeded with an assessment of each dependent variable. Prior to the univariate test, the Levene's Test of Equality of Error Variances was conducted for the assumption of homogeneity of variances for each dependent variable. The results revealed while three dependent variables (health, weather, and skill/confidence) were statistically significant ($< .05$) indicating equal variance across levels of independent variable, the other variables, social ($p = .063$), cost ($p = .057$), time ($p = .243$), and time

($p = .890$) were not statistically significant. Thus, the results of Levene's test partially upheld the assumption of homogeneity of variance, but, as Stevens (2009) stated the robustness of the F statistic, the researcher proceeded with the analysis.

Each dependent variable was analyzed by running separate univariate test. There was a statistically significant effect of experience in virtual golf on social, cost, time, and skill/confidence, but not on health and weather (Table 14). That is, the univariate tests indicated experience in virtual golf was significantly associated with (a) social, $F(1, 387) = 14.101, p < 0.001$, partial $\eta^2 = .035$), (b) cost, $F(1, 387) = 16.019, p < 0.001$, partial $\eta^2 = 0.040$), (c) time $F(1, 387) = 34.696, p < 0.001$, partial $\eta^2 = .082$), and (d) skill/confidence $F(1, 387) = 75.492, p < 0.001$, partial $\eta^2 = .163$). Specifically, the four constraints (i.e., social, cost, time, and skill/confidence) had larger influences on non-experienced individuals in participating in virtual golf, as can be seen in table 15. However, given that two of those factors had low scores of partial Eta Squared: social (.035) and cost (.040), the relatively smaller practical significance of them was considered.

Table 14

Results of MANOVA: Differences in Leisure Constraints between Experienced and non-Experienced in Virtual Golf

Source	DV	SS	df	MS	F	p	η^2
Experience	Social	16.967	1	16.967	14.101	<.001*	.035
	Health	.352	1	.352	.171	>.001	.000
	Cost	32.311	1	32.311	16.019	<.001*	.040
	Weather	7.085	1	7.085	2.334	>.001	.006
	Time	70.654	1	70.654	34.696	<.001*	.082
	Skill/Confidence	151.033	1	151.033	75.492	<.001*	.163
Error	Social	465.644	387	1.203			
	Health	797.347	387	2.060			
	Cost	780.584	387	2.017			
	Weather	1174.815	387	3.036			
	Time	788.075	387	2.036			
	Skill/Confidence	774.249	387	2.001			

Total	Social	4011.667	389
	Health	3399.333	389
	Cost	4839.250	389
	Weather	4318.889	389
	Time	5209.889	389
	Skill/Confidence	5628.609	389

Table 15

Means and Standard Deviations for Leisure Constraints between Experienced and non-Experienced in Virtual Golf

Variable	Social		Health		Cost		Weather		Time		Skill/ Confidence	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Ex	2.81	1.01	2.55	1.31	2.94	1.32	2.71	1.53	2.94	1.43	2.89	1.30
Non-Ex	3.23	1.18	2.61	1.56	3.52	1.52	2.98	1.95	3.80	1.41	4.14	1.53

Research Question 3

RQ3: Which constraints differ among household income levels (high, medium, and low) in participating in virtual golf?

To address research question 3, the researcher performed a three-group MANOVA to examine whether household income significantly have relationships with constraints in virtual golf. This analysis applied six leisure constraints (i.e., social, health, cost, weather, time, and skill/confidence) as the dependent variables, and the participants were divided into three groups (i.e., high, medium, and low) based on household income as the independent variable. Regardless of respondents' experiences in actual and virtual golf, all respondents were involved in this analysis to understand influence of financial resources on participation in virtual golf.

Prior to the analysis, assumptions were checked: (a) independence, (b) normality, and (c) equality of covariances. As mentioned, since respondents completed the survey independently without duplication, the assumption of independence was met. Next, the assumption of normality was fulfill with straight diagonal lines in the *Q-Q* plots,

indicating the dependent variables were normally distributed. Last, the Box's Test of equality of covariance matrices was significant (Box's $M = 71.527$, $F=1.665$, $p < .01$), indicating that the dependent variable covariance matrices were not equal across the three levels of the independent variable (household income). The violation of the homogeneity of covariances has minimal influence when a largest group should be no larger than 1.5 the size of a smallest group (Stevens, 2009). In this analysis, three groups based on household income: low ($n = 142$), medium ($n = 107$), and high ($n = 140$) met the standard. Also, given that F statistic is robust against heterogeneous variances (Field, 2009), the researcher proceeded with this analysis. Additionally, Bartlett's Test of Sphericity was statistically significant ($\chi^2 = 595.828$, $p < .001$), indicating sufficient correlation between the dependent variables.

Next, the multivariate test showed significant differences among three household income groups on the dependent variables (i.e., social, health, cost, weather, time, and skill/confidence). For example, the Wilks's lambda was .839 and its $F(6,381) = 5.806$, $p < 0.001$, partial $\eta^2 = .084$. This suggested that the combined dependent variables were significantly affected by household income groups, and the independent variable (three household income groups) accounts for about 8.4 % of the total variance in the dependent variable set. Given that the multivariate test was statistically significant, the Levene's Test of Equality of Error Variances was performed for the assumption of homogeneity of variances for additional univariate tests. Non-significant Levene's tests showed that the homogeneity of variance assumption for each of the dependent variable was upheld.

Based on adjusted alpha level using Bonferroni correction ($P = 0.05/3 = .016$), the univariate ANOVAs for (a) social, $F(2,386) = 5.007$, $p = 0.007$, partial $\eta^2 = .025$, (b) cost,

$F(2, 386) = 28.809, p < 0.0017$, partial $\eta^2 = .134$, (c) time, $F(2,386) = 5.256, p = 0.006$, and (d) skill/confidence, $F(2,386) = 7.024, p < 0.001$, partial $\eta^2 = .035$, were statistically significant. However, the rest of univariate ANOVAs were not statistically significant: (a) health, $F(2,386) = .209, p = 0.812$, partial $\eta^2 = .001$, partial $\eta^2 = .027$ and (d) weather, $F(2,386) = .932, p > 0.395$, partial $\eta^2 = .005$. The detailed information is presented in Table 16. To follow up the significant effect of household income on leisure constraints in virtual golf, Tukey HSD post hoc analyses were performed. For the social constraint, the low income group ($M = 3.21, SD = 1.12$) indicated significant higher scores than the high income group ($M = 2.80, SD = 1.15$). For the cost constraint, the low income group ($M = 3.87, SD = 1.46$) indicated significantly higher scores than the medium income group ($M = 3.09, SD = 1.22$) and the high income group ($M = 2.64, SD = 1.32$). For the time constraint, the low income group ($M = 3.66, SD = 1.54$) showed significantly higher scores than the high income group ($M = 3.13, SD = 1.40$). For the skill/confidence constraint, the low income group ($M = 3.85, SD = 1.51$) indicated significantly higher scores than the high income group ($M = 3.20, SD = 1.57$), as can be seen in table 17.

Table 16
Results of MANOVA: Differences in Leisure Constraints between Household Income Groups in Virtual Golf

Source	DV	SS	df	MS	F	p	η^2
Income	Social	12.204	2	6.102	5.007	<.001*	.025
	Health	.862	2	.431	.209	>.001	.001
	Cost	108.754	2	54.377	29.809	<.001*	.134
	Weather	5.678	2	2.839	.932	>.001	.005
	Time	22.766	2	11.383	5.256	<.001*	.027
	Skill/Confidence	32.493	2	16.247	7.024	<.001*	.035
Error	Social	470.406	386	1.219			
	Health	796.837	386	2.064			
	Cost	704.141	386	1.824			
	Weather	1176.223	386	3.047			
	Time	835.963	386	2.166			
	Skill/Confidence	892.789	386	2.313			

Total	Social	4011.667	389
	Health	3399.333	389
	Cost	4839.250	389
	Weather	4318.889	389
	Time	5209.889	389
	Skill/Confidence	5628.609	389

Table 17

Means and Standard Deviations for Leisure Constraints between Household Income Groups in Virtual Golf

Income	Social		Health		Cost		Weather		Time		Skill/ Confidence	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Low	3.21	1.12	2.61	1.55	3.87	1.46	2.96	1.81	3.66	1.54	3.85	1.51
Medium	3.01	1.00	2.62	1.35	3.09	1.22	2.87	1.69	3.19	1.46	3.33	1.46
High	2.80	1.15	2.52	1.37	2.64	1.32	2.68	1.71	3.13	1.40	3.20	1.57

Research Question 4

RQ4: Which constraints differ among mastery levels (master, advanced, intermediate, and beginner) in participating in virtual golf?

To address research question 4, the researcher conducted a four-group MANOVA to investigate whether mastery significantly influences constraints in virtual golf. The respondents who have never experienced in virtual golf and only have experienced in actual golf were excluded in this analysis in order to focus on the influence of mastery in virtual golf. This analysis utilized six leisure constraints (i.e., social, health, cost, weather, time, and skill/confidence) as the dependent variables, and the participants were divided into four groups based on the self-reported average scores in virtual golf (i.e., master, advanced, intermediate, and beginner) as the independent variable.

Prior to the analysis, assumptions were checked: (a) independence, (b) normality, and (c) equality of covariances. As mentioned above, the assumption of independence was met in that all surveys were completed independently without duplication. Next, the assumption of normality was met with straight diagonal lines in the *Q-Q* plots. Last, the

Box's Test of equality of covariance matrices was significant (Box's $M = 103.188$, $F = 1.548$, $p < .01$), violating the homogeneity of covariances. However, given that F statistic is robust against heterogeneous variances (Field, 2009), the researcher proceeded with this analysis. Additionally, Bartlett's Test of Sphericity was statistically significant ($\chi^2 = 449.792$, $p < .001$), indicating sufficient correlation between the dependent variables.

Next, the multivariate test showed significant differences among four mastery groups on the dependent variables (i.e., social, health, cost, weather, time, and skill/confidence). For example, the Wilks's lambda was .839 and its $F(6, 365) = 2.011$, $p < 0.001$, partial $\eta^2 = .057$. This suggested that the combined dependent variables were significantly affected by four mastery groups, and the independent variable accounted for about 8.4 % of the total variance in the dependent variable set. Given that the multivariate test was statistically significant, the Levene's Test of Equality of Error Variances was performed to verify the assumption of homogeneity of variances for additional univariate tests. Non-significant Levene's tests showed that the homogeneity of variance assumption for each of the dependent variable was upheld.

Based on adjusted alpha level using Bonferroni correction ($P = 0.05/6 = .008$), the univariate ANOVAs for cost, $F(3, 205) = 5.945$, $p = 0.001$, partial $\eta^2 = .080$, and skill/confidence, $F(3, 205) = 6.189$, $p = .000$, partial $\eta^2 = .083$, were statistically significant. However, the rest of univariate ANOVAs were not statistically significant: (a) social, $F(3, 205) = 1.437$, $p = .233$, partial $\eta^2 = .021$, (b) health, $F(3, 205) = .209$, $p = .199$, partial $\eta^2 = .022$, (c) time, $F(3, 205) = 1.990$, $p = .117$, partial $\eta^2 = .028$, and (d) weather, $F(3, 205) = .644$, $p = .587$, partial $\eta^2 = .009$. The detailed information is presented in Table 18. To follow up the significant effect of mastery on leisure constraints in virtual

golf, Tukey HSD post hoc analyses were conducted. For the cost constraint, the beginner group ($M = 1.44$, $SD = 1.41$) indicated significant higher scores than the advanced group ($M = 2.47$, $SD = 1.17$). For the skill/confidence constraint, the beginner group ($M = 3.46$, $SD = 1.36$) revealed significantly higher scores than the advanced group ($M = 2.54$, $SD = 1.25$) and the master group ($M = 2.63$, $SD = 1.35$), as can be seen in table 19.

Table 18

Results of MANOVA: Differences in Leisure Constraints among Mastery Groups in Virtual Golf

Source	DV	SS	df	MS	F	p	η^2
Mastery	Social	4.412	3	1.471	1.437	>.008	.021
	Health	7.997	3	2.666	1.565	>.008	.022
	Cost	29.082	3	9.694	5.945	<.008*	.080
	Weather	4.553	3	1.518	.644	>.008	.009
	Time	12.156	3	4.052	1.990	>.008	.028
	Skill/Confidence	29.270	3	9.757	6.189	<.008*	.083
Error	Social	209.790	205	1.023			
	Health	349.100	205	1.703			
	Cost	334.266	205	1.631			
	Weather	482.968	205	2.356			
	Time	417.521	205	2.037			
	Skill/Confidence	323.173	205	1.576			
Total	Social	1874.111	209				
	Health	1724.889	209				
	Cost	2181.875	209				
	Weather	2027.556	209				
	Time	2247.222	209				
	Skill/Confidence	2108.828	209				

Table 19

Means and Standard Deviations for Leisure Constraints among Mastery Groups in Virtual Golf

	Social		Health		Cost		Weather		Time		Skill/ Confidence	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Mastery												
Master	2.87	1.19	2.34	1.19	2.89	1.32	2.87	1.52	3.08	1.52	2.63	1.35
Advanced	2.60	1.02	2.49	1.26	2.47	1.17	2.58	1.53	2.62	1.37	2.54	1.25
Intermediate	2.87	0.95	2.44	1.20	3.00	1.18	2.56	1.33	2.90	1.28	2.87	1.02
Beginner	2.96	0.90	2.85	1.48	3.44	1.41	2.87	1.68	3.23	1.52	3.46	1.36

Research Question 5

RQ5: What are the structural relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions in virtual golf?

To analyze the research questions, the following eight hypotheses were addressed.

H1: Core service has a direct positive influence on perceived value.

H2: Core service has a direct positive influence on consumer satisfaction.

H3: Peripheral service has a direct positive influence on perceived value.

H4: Peripheral service has a direct positive influence on consumer satisfaction.

H5: Perceived value has a direct positive influence on consumer satisfaction.

H6: Consumer satisfaction has a direct positive influence on behavioral intentions.

H7: Core service has an indirect positive influence on consumer satisfaction.

H8: Peripheral service has an indirect positive influence on consumer satisfaction.

The researcher conducted a Structural Equation Modeling (SEM) to examine structural relationships among various constructs in terms of consumer behaviors. Only respondents having experience in virtual golf were involved in this analysis in order to focus on actual consumption experiences in virtual golf. This analysis applied five factors reconstructed by the principal component analysis (PCA) (i.e., core service, peripheral service, perceived value, consumer satisfaction, behavioral intentions). Specifically, core service and peripheral service were exogenous variables (independent variables), and perceived value, consumer satisfaction, and behavioral intentions were endogenous variables (dependent variables). The factors of perceived value was also mediators in the model.

Measurement model. The measurement model including 17 items and five latent

variables was examined using AMOS. As can be seen in Table 19, all five factors were positively correlated. The size of correlation coefficient ($r = .63, p < .001$) between consumer satisfaction and behavioral intentions was as high as expected. Furthermore, the relatively higher correlations of perceived value with consumer satisfaction ($r = .53, p = .00$) and behavioral intentions ($r = .55, p < .001$) indicated the significant role of reasonable pricing on consumer behaviors. On the other hand, as not expected, the correlation coefficient between peripheral service and perceived value ($r = .05, p = .45$) was not significant. Also, even if the correlations of peripheral service with consumer satisfaction ($r = .24, p < .001$) and behavioral intentions ($r = .20, p < .001$) were significant, the relation was relatively weak. As such, the effect of peripheral service on other factors would be necessary to be discussed through the structural model.

Additionally, based on the criteria (.40 cutoff criteria) (Stevens, 2009), all factor loadings were significant ($p < .01$), ranging from 0.49 to 0.98 (Figure 18): (a) core service ($x1 = .84, x2 = .88, x3 = .77$, and $x4 = .67$), (b) peripheral service ($x5 = .98, x6 = .84, x7 = .49$), (c) perceived value ($x8 = .87, x9 = .81, x10 = .83$, and $x11 = .65$), (d) consumer satisfaction ($x12 = .90, x13 = .92$, and $x14 = .87$), and (e) behavioral intentions ($y1 = .92, y2 = .90$, and $y3 = .96$).

In terms of the extent to which each indicator variable was good measure of the given latent variable, the measurement model also generated the result of squared multiple correlations. For example, the multiple R^2 of two indicators were relatively high ($x5 = .924$ and $y3 = .958$), indicating that more than 90% of the variance in the indicators was accounted for by given latent variables. On the other hand, the multiple R^2 of three other indicators were relatively low ($x7 = .243, x11 = .425$ and $x4 = .449$), indicating that

less than 45% of the variance in the indicators was explained by given latent variables.

All the observed fit statistics showed a good fit to the data ($\chi^2 = 232.685$, $df = 109$, $p < 0.01$, normed fit index [NFI] = .915, comparative fit index [CFI] = .952, root mean square error of approximation [RMSEA] = .074). Given that values of NFI and CFI above .90 (Kline, 1998) and RMSEA of .08 or less (Browne & Cudeck, 1993) were considered adequate, the measurement model to the data was acceptable.

Table 20
Factor Correlations between Variables

Variables	1	2	3	4
1. Core	-			
2. Peripheral	.32**	-		
3. Value	.36**	.05**	-	
4. Satisfaction	.42**	.24**	.53**	-
5. Intention	.38**	.20**	.55**	.63**

Note. ** $p < .01$

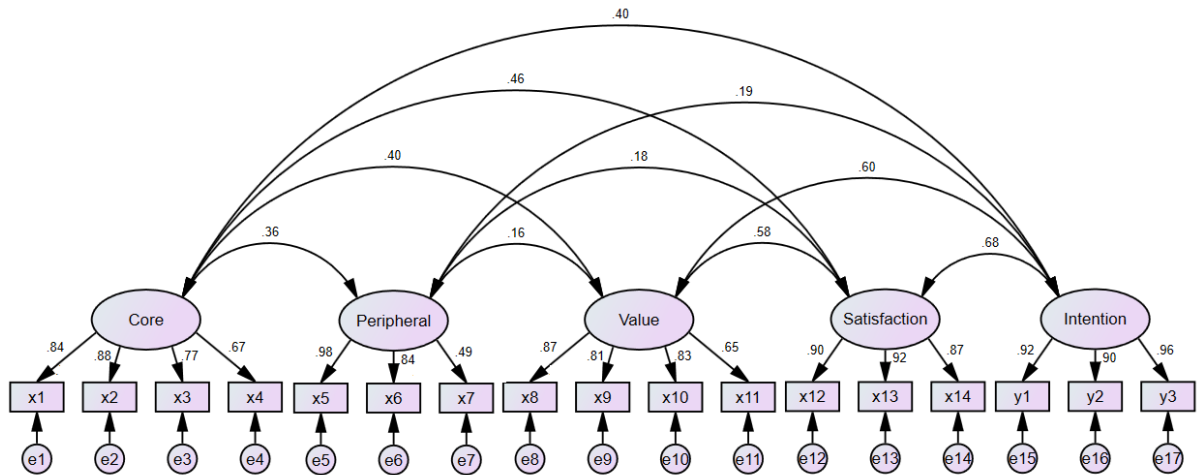


Figure 18. Measurement Model of Consumer Behaviors in Virtual Golf

Structural model. Core service and peripheral service were exogenous (independent) variables, and perceived value, consumer satisfaction, and behavioral intentions were endogenous (dependent) variables. The factors of perceived value and consumer satisfaction were also mediators in the model. Each latent variable was

presented by the following indicator variables: (a) core service (x1, x2, x3, and x4), (b) peripheral service (x5, x6, and x7), (c) perceived value (x8, x9, x10, and x11), (d) consumer satisfaction (x12, x13, and x14) and (e) behavioral intentions (y1, y2, and y3). All the observed fit statistics showed a good fit to the data ($\chi^2 = 251.808$, $df = 112$, $p < 0.01$, normed fit index [NFI] = .908, comparative fit index [CFI] = .946, root mean square error of approximation [RMSEA] = .077). Given that values of NFI and CFI above .90 (Kline, 1998) and RMSEA of .08 or less (Browne & Cudeck, 1993) were considered adequate, the measurement model to the data was acceptable.

The structural model (Figure 19) showed the standardized coefficients for the paths between the exogenous latent factors and the endogenous latent factors (the unstandardized coefficients between latent factors are addressed in Table 21). The results supported the hypotheses 1, 2, 5, 6, and 7, indicating that four standardized path coefficients were significant: (a) core service to perceived value ($\beta = 0.39$), (b) core service to consumer satisfaction ($\beta = 0.27$), (c) perceived value to consumer satisfaction ($\beta = 0.49$), and (d) consumer satisfaction to behavioral intentions ($\beta = 0.69$). However, the hypotheses 3, 4, and 8 were not supported from this analysis, showing that the following two standardized path coefficients were not significant: (a) peripheral service to consumer satisfaction ($\beta = 0.02$) and (b) peripheral service to perceived value ($\beta = 0.02$).

Additionally, this analysis (Table 22) showed most of the exogenous factors had direct and indirect effects on endogenous factors. In terms of direct effects, (a) core service had a significant direct effect on perceived value ($\beta = .370$) and consumer satisfaction ($\beta = .268$), (b) perceived value had a significant direct effect on consumer

satisfaction ($\beta = .491$), and (c) consumer satisfaction had a significant direct effect on behavioral intentions ($\beta = .692$). Particularly, consumer satisfaction had the largest direct effect on behavior intentions, indicating that consumers in virtual golf who were more satisfied had stronger behavioral intentions. However, peripheral service did not have any statistically significant direct effect on perceived value ($\beta = .20$) and consumer satisfaction ($\beta = .015$). In regard to indirect effects, whereas core service had a significant indirect effect on consumer satisfaction ($\beta = .192$), peripheral service did not ($\beta = .010$).

As a result, the noticeable hypothesized paths revealed that all variables except peripheral service had direct or indirect influences on given variables. In other words, it might be evident that peripheral service did not play a significant role in this structural model of consumer behaviors in virtual golf. Core service, however, not only had a significant direct effect on satisfaction, but also had an indirect effect on satisfaction via perceived value. A further discussion in terms of the structural relationships among factors will be addressed in the chapter 5.

Table 21
Standardized and Unstandardized Parameter Estimates

Parameter		Estimates
Core	→ Value	.379 (.390)***
Core	→ Satisfaction	.343 (.268)***
Peripheral	→ Value	.017 (.020)
Peripheral	→ Satisfaction	.016 (.015)
Value	→ Satisfaction	.648 (.491)***
Satisfaction	→ Intentions	.746 (.692)***

Note. *** $p < .001$, Standardized estimates in parentheses

Table 22
Direct, Indirect, and Total Effects among Variables

IV	DV	Direct Effect	Indirect Effect	Total Effect
Core	Value	.390	.000	.390
	Satisfaction	.268	.192	.460
Peripheral	Value	.020	.000	.020
	Satisfaction	.015	.010	.025
Value	Satisfaction	.491	.000	.491
Satisfaction	Intentions	.692	.000	.692

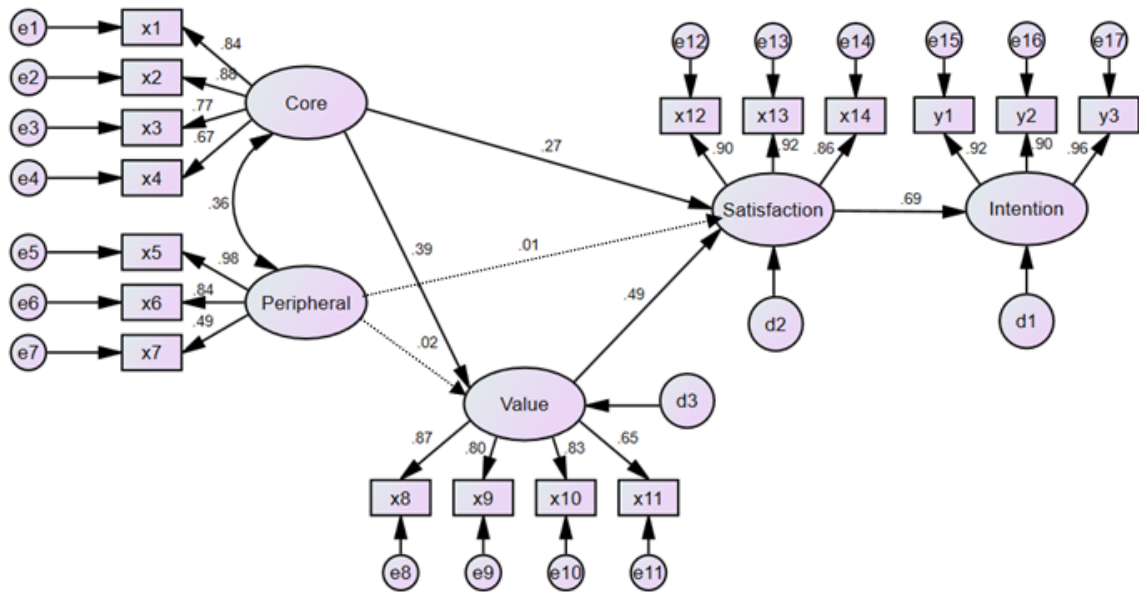


Figure 19. Structural Model of Consumer Behaviors in Virtual Golf

Note. The solid lines show significant paths ($p < .01$), and the dotted lines show non-significant paths.

Summary of Results

The current study investigated participation constraints and consumer behaviors in virtual golf with individuals with diverse golf experiences. Prior to the main analysis, EFAs using principal component analysis with Varimax rotation examined all instruments, and the results retained six factors (i.e., social, health, cost, time, weather, and skill/confidence) on leisure constraints and five factors (i.e., core service, peripheral

service, perceived value, consumer satisfaction, and behavioral intentions) on consumer behaviors in virtual golf.

The first analysis conducted a set of paired samples *t* tests on each of six constraint factors based on the two golf contexts (i.e., actual and virtual golf) with all survey respondents. The results revealed statistically significant mean differences on the factors of cost, weather, time, and skill/confidence. Specifically, respondents in this analysis reported higher scores of leisure constraints on the four factors when participating in actual golf rather than virtual golf. The second analysis performed a two-group MANOVA on the six constraints factors with two groups based on their experiences in virtual golf (i.e., experienced and non-experienced). The results showed that there were statistically significant differences on four constraint factors (i.e., social, cost, time, and skill/confidence). Especially, the non-experienced group had higher mean scores than the experienced group when playing virtual golf. The third analysis implemented a three-group MANOVA on the six constraint factors with three groups based on household income level (i.e., high, medium, and low). The results found significant mean differences on the factors of social, cost, time, and skill/confidence. Additionally, the follow-up, post-hoc tests showed that participants in the low household income level group reported significantly higher constraints scores than the higher household income level group. The fourth analysis conducted a four-group MANOVA on the six constraint factors with four groups based on mastery (i.e., beginner, intermediate, advanced, and master) for respondents who have experiences in virtual golf. The results found significant differences on the factors of cost and skill/confidence, and the follow-

up post-hoc tests revealed the beginner group reported higher constraints scores on cost than the advanced group and skill/confidence than the advanced and master groups.

The last analysis performed Structural Equation Modeling (SEM) to investigate relationships among constructs (i.e., core service, peripheral service, perceived value, consumer satisfaction, and behavioral intentions) with survey respondents who had experiences in virtual golf. From the measurement model, all five latent factors, including 16 items, were correlated, and revealed significant factor loadings. Furthermore, the observed fit statistics showed an acceptable fit to the data. From the structural model, four standardized path coefficients were significant: (a) core service to perceived value, (b) core service to consumer satisfaction, (c) perceived value to consumer satisfaction, and (d) consumer satisfaction to behavioral intentions. Additionally, one of two indirect path coefficients between core service and consumer satisfaction was significant.

CHAPTER V

DISCUSSION

Considering various constraints affect individuals' leisure participation (Crawford et al., 1991), it is important to understand the influence of these constraints on individuals' leisure decisions. Since virtual golf is an emerging sport-related entertainment business, eliminating leisure constraints may make it easier for more people to participate. Additionally, it is essential to investigate relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions. Typically, consumers who are satisfied with high quality and reasonable pricing exhibit favorable behavioral intentions (Shukla, 2010).

The primary purposes of this study were to (a) investigate differences of golfers' constraints between participation in actual golf and virtual golf, (b) compare constraints between experienced and non-experienced individuals in virtual golf, (c) examine effects of household income on constraints in virtual golf, (d) investigate effects of mastery on constraints in virtual golf, and (e) explore relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions in virtual golf.

Research Questions

RQ1: What are the differences in constraints between participation in actual golf and virtual golf?

RQ2: Which constraints differ between experienced and non-experienced golfers participating in virtual golf?

RQ3: Which constraints differ among household income levels (high, medium, and low) in participating in virtual golf?

RQ4: Which constraints differ among mastery levels (master, advanced, intermediate, and beginner) in participating in virtual golf?

RQ5: What are the structural relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions in virtual golf?

The next section will discuss the results of the five research questions, followed by theoretical and practical implications of the study's findings. In addition, suggestions for future research and a summary of this study will be provided.

Summary of Results

This study focused on understanding an individual's entire decision making process regarding leisure participation in virtual golf. The results provided meaningful information regarding participation constraints and the structural relationships among service quality, perceived value, consumer satisfaction, and behavioral intentions related to virtual golf.

Results relative to the first research question indicated individuals' leisure constraints differed between participating in actual and virtual golf, based on six leisure constraints (i.e., social, cost, health, weather, time, and skill/confidence), using a set of paired sample *t* tests. Specifically, there were statistically significant mean differences for cost, weather, time, and skill/confidence depending on the type of golf, but not for social and health. That is, the results showed that these four constraints (cost, weather, time, and skill/confidence) were presenting greater barriers to participating in actual golf compared to virtual golf. In other words, virtual golf might provide more participation opportunities

as it reduces the burden on the consumer in terms of cost, weather, time and skill/confidence.

Next, the second research question used a two-group MANOVA to compare leisure participation constraints between experienced and non-experienced virtual golf players. Differences emerged between the two groups on six leisure constraints. While four variables (social, cost, time, and skill/confidence) were statistically significant, the other variables (health and time) were not. Therefore, individuals who had never played virtual golf faced more constraints regarding social, cost, time, and skill/confidence when considering whether or not to participate in virtual golf. Considering non-experienced potential virtual golfers were a part of the sample, the perceptions of virtual golf or golf itself might have a great effect on the result.

The third research question used a three-group MANOVA to explore whether household income had a significant impact on constraints in virtual golf. Results indicated significant differences among three income levels (i.e., high, medium, and low). Four constraints (social, cost, time, and skill/confidence) were significant. The results revealed that individual financial status had a significant influence on participation in virtual golf except in two factors (health and weather). Additional follow-up analyses revealed that the low-income group reported significantly higher constraints scores than the high-income group on these four constraints. Thus, individuals with low household income were more likely to face participation constraints compared to the other income groups in this study when participating in virtual golf.

The fourth research question applied a four-group MANOVA to examine whether golf mastery significantly influences constraints in virtual golf with respondents who

have experience in virtual golf. The participants were divided into four groups based on the self-reported average scores in virtual golf (i.e., master, advanced, intermediate, and beginner). The results reported significant differences among four mastery groups on two leisure constraints (cost and skill/confidence). Additional follow-up analyses revealed that the beginner group was more likely to experience cost constraints than the advanced group. The beginner group was also more likely face skill/confidence constraints than the advanced and master groups.

The fifth research question utilized a Structural Equation Modeling (SEM) to understand relationships among various constructs (i.e., core service, peripheral service, perceived value, consumer satisfaction, behavioral intentions) in terms of consumer behaviors. This provided both measurement and structural models with respondents who only had experience in virtual golf. From the measurement model, all the observed fit statistics showed a good fit to the data. From the structural model, (a) core service had direct and indirect influence on perceived value and consumer satisfaction, (b) perceived value had direct influence on consumer satisfaction, and (c) consumer satisfaction had influences on behavior intentions. However, peripheral service had no direct or indirect effects between factors.

Interpretation of Results

Given the purposes and significance of this study, the following section focuses on interpretations of results of each research question based on empirical evidence. The focus is on (a) empirical evidence from investigating differences of consumers' participation constraints based on type of golf, golf experiences, household income, and mastery in virtual golf; and (b) empirical evidence regarding a complex consumer

decision-making process in virtual golf.

Research Question 1

The first research question investigated the differences in constraints between participation in actual golf and virtual golf. Results from this research question identified the reason for the enormous growth and future potential of virtual golf in the Republic of Korea. The results illustrated significant differences between virtual and actual golf for the four constraints of cost, weather, time, and skill/confidence. Importantly, the mean scores for all four of the significant constraints were higher in actual golf than virtual golf. Those scores mean that respondents' participation was less limited by constraints when participating in virtual golf rather than actual golf. The constraints factor of weather showed the largest mean difference. In other words, the finding could be interpreted that the strength of the indoor sport (virtual golf) eliminated the weakness of the outdoor sport (actual golf), which might be vulnerable in changing weather. In that sense, the difference from the weather factor might be a natural result. On the other hand, it would be considered that the result confirmed the most attractive strength of virtual golf once again, and the strength would not be confined to golfers in the Republic of Korea. Considering that golf is not the only outdoor sport affected by weather, the benefit of indoor virtual sports being impervious to weather could greatly influence the development of various types of virtual sports (e.g. virtual baseball and virtual tennis). However, as mentioned earlier, a fundamental reason people enjoy golf might be to be surrounded by nature, so the benefit related to weather would not necessarily be considered positive. Thus, it may be necessary to apply more advanced technology to offer better, more realistic feeling, environments for customers in virtual sports.

The second and third largest mean differences were revealed in the time and cost constraints, indicating higher mean scores in actual golf than virtual golf. Considering this analysis was based on the comparison between two golf contexts, the result should be interpreted that virtual golf presented fewer temporal and financial burdens than actual golf, regardless of the objective assessment about virtual golf. Knowing psychological feelings consumers use to determine relative comparison with an initial standard or reference points (Oliver, 1980; Williams, 1989), the result of this analysis are understandable. Thus, the perception of participants related to expense in virtual golf might be determined through comparison with the initial standard or reference point (i.e., cost of existing actual golf in this study). Even if the expense of playing virtual golf may not be considered reasonable in some cases, it could be true that virtual golf has reduced individuals' financial burden. Considering virtual golf was initially invented so people could enjoy golf with minimal financial concerns (Choe, 2008), the result of this analysis was notable. Of course, the perception of participants related to time needed to play virtual golf would be also compared with actual golf. As mentioned before, in spite of the fact that a round of virtual golf still takes several hours, that may be perceived as a relatively short time, especially since the virtual golf centers may be closer to where the golfer lives as opposed to driving out of the city to play at an actual golf course (hence, decreased drive time to get to the virtual golf facility factors in).

Lastly, despite relatively smaller mean differences, the constraints factor of skill/confidence had significant mean differences, with a higher mean score in actual golf than virtual golf. This finding could be interpreted to mean that individuals perceived they might need higher levels of skill and confidence when participating in actual golf

compared to virtual golf. A plausible reason could be identified from previous results in this study. Given that participants already reported financial constraints when participating in actual golf, the practical burden might add to their anxiety related to the skill/confidence factor. On the other hand, in virtual golf, which is relatively affordable, participants who never or rarely experienced any kind of golf might play golf with reduced burdens related to skill/confidence. In addition, beginners in this study might simply think that others who have played on actual golf courses are more skilled. Last, knowing that golf is typically regarded as the sport for only socio-economically upper-level people in the Republic of Korea (Kwon, 2006), the sense of distance from rigid social recognition might be another reason.

Characteristics of actual and virtual golf contexts. The mean scores of each leisure constraints factor in two golf contexts provided interesting information. In the actual golf context, the mean scores for weather ($M = 4.93$), cost ($M = 4.19$), and time ($M = 4.48$) constraints were relatively higher than the others. In other words, participants reported those factors highly limited their leisure participation in actual golf. Of all constraints factors regardless of golf contexts, only these three factors in actual golf exceeded 4.0 of mean scores. Given that this current study applied a 7-point Likert-type scale for survey questions, a score higher than 4.0 might be seen as an objectively high score from the survey respondents' perspectives. However, the results were fully predictable. As mentioned earlier, almost all golf courses in the Republic of Korea are located far from cities and charge approximately \$200 per round (Kwon, 2006). Also, the long, cold winter might be another burden to golfers in the Republic of Korea. Thus, the higher mean scores in weather, cost, and time constraints of actual golf were inevitable

results of the high cost of play, difficult accessibility, and cold weather. Compared to the results of cost ($M = 2.64$), weather ($M = 2.89$), and time ($M = 2.89$) from a previous study (Jun & Kyle, 2011a) conducted in the United States of America with golfers, the findings in this study might identify the extent to which those three constraints factors are significant in participation in actual golf in the Republic of Korea.

In the virtual golf context, noticeably high mean scores were seen with the factors of skill/confidence ($M = 3.47$) and time ($M = 3.34$). However, the absolute values of those factors were not higher than 4.0, which might mean that these were not constraints with great effects on participating in virtual golf. Nevertheless, it is necessary to discuss the reasons why these two factors had higher mean scores than the others. Unlike actual golf, meaning "leisure in nature," playing virtual golf may be closer in meaning to "game or competition with acquaintances." If so, individuals with low levels of performance might encounter psychological barriers to participating in virtual golf. Additionally, in general, one of the benefits of virtual golf might be to reduce overall time because virtual golf centers are conveniently located and open 24 hours. However, a previous study (Han et al., 2014) already indicated that time saving was not found to positively influence participation in virtual golf. One plausible reason why the factor of time has not been considered one of the strengths in virtual golf would be that playing golf of either kind might be perceived as a time-consuming activity. In spite of saving time through greater accessibility compared to actual golf, this mean score revealed that time saving may not be a benefit of virtual golf.

Research Question 2

The second research question examined differences in constraints between

experienced and non-experienced virtual golf consumers. It explored leisure constraints of potential consumers, which could provide important information to expand player interest compared to existing consumers. The results indicated significant differences with the four constraints of social, cost, time, and skill/confidence between the two groups. Specifically, mean scores in all the four constraints were significantly higher among non-experienced consumers in virtual golf. That is, potential consumers who have never experienced virtual golf reported heavier burdens regarding these constraints when participating in virtual golf.

The skill/confidence factor, with the highest mean score among all factors, was notable. The mean score of the factor was the only one greater than 4.0, and the mean difference measured between experienced and non-experienced groups was also the largest in this analysis. As mentioned earlier, the social recognition that golf is regarded as a sport for people with upper level socio-economic status in the Republic of Korea (Kwon, 2006) might have a significant effect on individuals' participation in virtual golf. Regardless of the type of golf, participants might have a preconceived notion related to confidence. The sense of distance from the sport, "golf", might influence psychological aspects of skill and confidence in virtual golf, particularly for non-experienced consumers.

Furthermore, based on the result that mean scores of other significant factors (i.e., social, cost, and time) in the non-experienced group were higher than the experienced group, the need for a change of social perceptions of golf was identified. The social perception that golf is a sport not readily available to the general public is a problem golf industry managers in the Republic of Korea need to address. However, in this analysis, the effect of experience in virtual golf played a great role in eliminating individuals'

psychological burdens when participating in virtual golf. Furthermore, in addition to the skill/confidence constraints, where all mean scores measured from the participants experienced in virtual golf were less than 3.0, most of the mean scores reported in the group of non-experienced golfers were greater than 3.0. Thus, the result of this analysis would appear to support the fact that virtual golf was created for beginners (Choe, 2008), and might suggest encouraging that group of potential consumers to participate in virtual golf.

Characteristics of each group depending on golf experience. The question about personal golf experience (Which one of the following golf contexts have you experienced?) was applied as a criterion to determine sample groups. The second research question divided participants into two groups (i.e., experienced and non-experienced in virtual golf). However, four segmented groups were actually available for analysis (i.e., only virtual golf, only actual golf, both of them, and none of them). Each group had different characteristics.

First, in addition to the skill/confidence constraints, a significant characteristic of the group who only played actual golf was the relatively high mean scores on the time constraints factor ($M = 3.50$) in virtual golf. Even if participants had never played virtual golf, they held perceptions that the convenient locations and flexible tee times of a virtual golf center might be strengths for time saving. Nevertheless, a plausible reason why potential virtual golf consumers in this study reported time constraints as one of the most significant constraints in participating in virtual golf might be their absence of experience. Participants without experience in virtual golf might compare their leisure constraints to experiences with actual golf. In spite of the strengths of virtual golf, regardless of the

type of golf, their experience that playing golf usually took 4 hours could be a tightly held standard of judgment in this analysis.

Second, a noticeable characteristic of the group who only played virtual golf was higher mean scores on the factor of cost constraint ($M = 3.66$). This result may be similar to the group who only played actual golf in that previous golf experiences might significantly affect their constraints regarding virtual golf. Based on the fact that virtual golf was invented for people to enjoy golf without financial burdens (Choe, 2008), reasonable price might be one of the strengths. However, people with biased golf experiences (e.g. only experienced in virtual golf) could perceive that virtual golf is also not reasonable due to the absence of a comparison standard. Another plausible reason for higher mean scores on cost constraints in the group who only played virtual golf was explained from objective demographic information in this study. Compared to the other three groups, the group who only played virtual golf had the youngest average age ($M = 36.35$) and the lowest household income level ($M = 2.35$). In other words, the group who only played virtual golf was composed of relatively younger people with low household incomes. Thus, regardless of their biased golf experiences and the absence of comparison, the result is understandable because the young people with the lowest income might have financial burdens when choosing to participate in a given leisure activity. Even if virtual golf offered services cheaper than actual golf, the impact of the price might still be different for each individual's financial situation.

Next, a significant characteristic of the group who played both actual and virtual golf was low mean scores in all constraints factors, indicating no mean score was greater than 3.0. Given respondents had experiences in both actual and virtual golf, comparisons

could be drawn . In that sense, expectancy-disconfirmation paradigm and comparison level theory might be applied to this finding. Consumers tend to establish their own "standard" from existing experiences, and that standard plays a significant role in making comparisons with new experiences (Cadotte et al., 1987; LaTour & Peat, 1979). As such, the previous golf experience in actual golf, which is relatively more difficult and expensive, might be their "standard" in this analysis. Using that standard could have a significant effect on low mean scores in all constraints factors in virtual golf, which is relatively easier and cheaper. Thus, the most likely reason for low mean scores seemed to be the existing experiences in actual golf. Additionally, except for the participants who never played both actual and virtual golf, most participants who had played golf ($n = 166$, 42.7%) enjoyed both forms. As such, this might mean virtual golf has become a form of golf entertainment without a sense of difference for existing golf customers.

Last, a notable feature of the group who played neither actual nor virtual golf was relatively higher mean scores across all constraints, a result contrary to the characteristics of the group who played both actual and virtual golf. Even if the three factors of cost, time, and skill/confidence were successfully eliminated in virtual golf, those constraints still showed higher mean scores: (a) cost ($M = 3.67$), (b) time ($M = 4.00$), and (c) skill/confidence ($M = 4.36$). This result supports an argument that attracting new consumers was a more difficult task than maintaining existing consumers (Shukla, 2010). It would not only indicate the extent to which experience greatly impacted consumer sentiment, but also clarify the reason why this study addressed Research Question 2 (Which constraints differ between experienced and non-experienced golfers participating in virtual golf?).

Research Question 3

The third research question examined the differences in constraints depending upon participants' household income level. Because self-reported household income data might have limitations, a tripartite split was applied. That is, three groups were established (i.e., low, medium, and high) based on household income, ensuring differences between at least two groups (high and low). Given the argument that virtual golf was invented to reduce financial barriers for individuals to play golf (Choe, 2008), the analysis in this study sought to confirm the extent of the substantive effects of reasonable pricing in virtual golf on participation constraints. There were significant differences on the three constraints of social, time, and skill/confidence in addition to the cost constraints, although the results differed by household income. Furthermore, a noticeable finding was that the mean scores in all the significant four constraints were higher for the low household income group than the high household income group, which might mean that customers with low household income were more constrained than those with higher household incomes. That is, the effect of household income was significant in participating in virtual golf.

In this study, mean differences based on cost constraints among the groups categorized by household income appear natural. However, the finding that the mean differences were significant was meaningful. This analysis indicated that many virtual golf consumers still experience financial burdens even if the cost of play was relatively more reasonable than actual golf. In other words, regardless of the comparison to actual golf, participation in virtual golf itself may still be regarded as a financial burden, and run counter to the initial business strategy of virtual golf being more affordable so more

people would participate. The result related to the cost factor should be discussed. Except for an obvious interpretation of the simple financial difference between low and high-income groups, social recognition could be a reason. As mentioned earlier, given that golf is generally regarded as a sport for socio-economically upper-level people in the Republic of Korea (Kwon, 2006), many consumers might perceive virtual golf the same way. The consumers' psychological financial objections in terms of actual golf could be applied to virtual golf. Additionally, the absolute financial cost to play virtual golf would have to be discussed. Except for an entry fee cost to a virtual golf facility, additional expenses could be required (e.g., practice and equipment not to mention food and beverage during the experience).

Next, significant differences were also found among three groups in this analysis for the factors of social and skill/confidence. Those factors do not seem to be related to the household income of participants. However, the two terms "socio-economically upper-level" and "financial burden," which were often mentioned for the cost factor, might be closely associated with the factors of social and skill/confidence. In regard to the social constraints factor, if golf is perceived as a sport for a particular social class in the Republic of Korea, participation by people in other social classes, which might be perceived as socio-economically low-level in some ways, might be limited in virtual golf. In that sense, while participants in the low household income group might be limited by social constraints, those in the high household income group would not be inhibited. Furthermore, in light of the skill/confidence factor, the result could be understood with the term "financial burden" because the factor was related to a concept of mastery. To acquire a high level of skill and confidence in virtual golf, frequent participation and

constant practice is essential. However, consumers in the low household income level would not be able to participate frequently due to "financial burden." The average scores in virtual golf showed a gap with levels of mastery between low ($M = 4.11$) and high ($M = 3.56$) income groups. Therefore, the constraints of cost could be the most essential factor in virtual golf in that the other constraints might be closely correlated with financial expense.

Finally, the factor of time, which did not seem to be related to financial burden, was also significantly different among the groups. The fact that virtual golf helps to diminish time limitations through advanced technology might be one of the most significant strengths of virtual golf. People may still generally perceive golf, actual or virtual, as an all-day commitment. Further research would be necessary to examine the relationship of participation constraints with other factors not included in this study (e.g., working time, life style, and accessibility from residential areas).

Characteristics of groups depending on household income. Additional characteristics of groups categorized by household income were revealed by their golf experiences. Specifically, it was necessary to address disparities between the low-income group and high-income groups. From the demographic information, golf experiences of participants in this study were diverse, as participants indicated they (a) only played golf on an outdoor course ($n = 71$, 18.3%), (b) only played virtual golf ($n = 43$, 11.1%), (c) both of them ($n = 166$, 42.7%), and (d) none of them ($n = 109$, 28.0%). Additionally, by combining factors of household income and golf experience, the two household income groups had different characteristics related to demographic and golfographic information.

Knowing the relationship between consumers' financial burden and the golf

industry environment in the Republic of Korea is essential to understanding consumer behaviors. In other words, given that there were two types of golf, high-priced golf (actual) and relatively low-priced golf (virtual), in the Republic of Korea, individuals' income and their golf experiences could be closely related. As seen in Table 22, while most participants (78.5%) in the high-income group had experience with actual golf, only 36.5% of participants in the low income group did. Next, compared to the low-income group ($n = 26$, 18.3%), very few respondents in the high-income group ($n = 6$, 4.3%) had experiences only in virtual golf. Moreover, in the low-income group, the number of participants who only played virtual golf ($n = 26$, 18.3%) was larger than the number of participants who only played actual golf ($n = 17$, 12.0%). Conversely, in the high-income group, the number of participants who only played actual golf ($n = 37$, 26.4%) was larger than the number of participants who only played virtual golf ($n = 6$, 4.3%). Lastly, nearly half of the respondents ($n = 64$, 45.1%) in the low-income group had never played any type of golf, the opposite of the high-income group ($n = 24$, 17.1%).

The results showed that individuals with different income levels had different participation patterns in golf, indicating that financial burden might affect individuals' leisure choice. Considering that virtual golf was invented to lighten financial burdens (Choe, 2008), the result that many consumers with relatively low income played virtual golf would be encouraging. The experiences with virtual golf could be a trigger consumption of both types of golf, suggesting a chance to develop the entire golf industry regardless of type of golf.

Table 23

Golf Experiences of Groups categorized by Household Income

	Low Income	High Income
Only played actual golf	$n = 17$ (12.0%)	$n = 37$ (26.4%)
Only played screen golf	$n = 26$ (18.3%)	$n = 6$ (4.3%)
Both	$n = 35$ (24.6%)	$n = 73$ (52.1%)
Neither	$n = 64$ (45.1%)	$n = 24$ (17.1%)

Research Question 4

The fourth research question investigated differences in constraints depending upon participants' mastery level in virtual golf. Just as with the third research question, given that the self-reported mastery information might have limitations, a quadripartite split was applied. That is, the four groups (i.e., beginner, intermediate, advanced, and master) based on mastery ensured differences between at least two groups (beginner and master). Considering the fact that virtual golf was developed for beginners (Choe, 2008), it would be interesting to understand the extent of the influence of virtual golf skill level on participation constraints. The results revealed significant differences with the two constraints of cost and skill/confidence among the four groups. Additionally, a notable finding was that all results of mean scores in all constraints factors were higher in the beginner group than the mastery group regardless of its significance among the groups.

There were significant differences on cost constraints even if the groups were categorized by mastery. Specifically, the beginner group ($M = 3.44$) had significantly higher scores than the advanced group ($M = 2.47$) on the factor of cost. Basically, from objective demographic information, the mean scores of household income in the beginner group were the lowest ($M = 2.98$). Furthermore, this score was the only mean lower than 3.0 when compared to other groups. Hence, the beginners with lower household incomes were more constrained by cost. Additionally, from a slightly different perspective, given

that all customers pay the same charge regardless of their mastery levels, it was necessary to consider further the significant result of cost constraints in this analysis. A predictable reason is a probability that the advanced group tends to invest more time and money, resulting in a relatively higher level of mastery than the beginner group. In that sense, the beginner group might be less committed in golf than the advanced group. In other words, the extent of perceived cost varied based on individuals' mastery level and vice versa.

In addition to cost constraints, the factor of skill/confidence constraints was also produced significant results. The beginner group ($M = 3.46$) showed significantly higher scores than two other groups: advanced ($M = 2.54$) and master ($M = 2.63$). Even if the result might be general within the groups divided by mastery level in virtual golf, a few specifics need to be addressed. The participants' mastery, which was relatively objective, and the skill/confidence constraints, which might be subjective, were very closely related in this analysis. Virtual golf is a sport consisting of many entertainment elements through advanced virtual reality, but this result might indicate that virtual golf participants seemed to emphasize concepts of skill and confidence as well. It might be because virtual golf is also a sport involving competition with friends. Given the skill/confidence constraints of the beginners group showed the highest mean score among all factors, as anticipated, mastery was the most significant psychological burden in virtual golf. To lessen the burdens related to mastery level for beginners, more various efforts from a marketing perspective are necessary. For example, it is necessary to (a) develop easier game formats within the virtual golf environment, not focusing on competition or performance itself, for beginners, and (b) strengthen other aspects of business such as food and beverage (F&B) for beginners to offer a variety of entertainment factors.

Characteristics of groups depending on mastery. In this analysis, statistically significant differences among groups existed. The result that the beginner group was more constrained by the factor of skill/confidence than other groups was understandable. However, the result that the master group indicated a higher mean score on the factor of skill/confidence than the advanced group was necessary to consider because the master group was composed of the most skilled participants in this study. The potential reason might be that the skilled golfers focus on their performance more than less skilled golfers. Due to those efforts to play better, the mastery group might report higher mean scores than the advanced and intermediate groups in this study.

Furthermore, the mean score of time constraints was the only result greater than 3.0 out of the six constraints factors for the master group. This finding would mean that consumers with high-level skill were exceptionally affected by time constraints when participating in virtual golf. A plausible reason could be found from golfographic information in this study. According to one survey question (how frequently do you play virtual golf per month?), participants in the master group played virtual golf most frequently. They tended to participate in virtual golf at least more than once or twice per month (39.5%). The finding that the master group devoted more time could be the most plausible reason. Additionally, another piece of golfographic information showed that 78.9% of respondents in the master group had experience with both actual and virtual golf, a much higher number than the other groups. Taken together, consumers with high level of skill in virtual golf generally played golf more frequently and had more diverse experiences regardless of the type of golf.

The beginner group also provided interesting information. Essentially, three

constraints factors in the beginner group were higher than 3.0: (a) cost ($M = 3.44$), (b) time ($M = 3.23$), and (c) skill/confidence ($M = 3.46$). The numbers were the highest of all scores in this analysis. These numbers suggest that most beginners had only limited virtual golf experience. Contrary to the master group, respondents in the beginner group played virtual golf least frequently. Most beginners (88.1%) reported participating in virtual golf less than once per month. As anticipated, the level of mastery in virtual golf was closely related to the frequency of playing. Lastly, although there were no statistically significant differences, health constraints were relatively higher in the beginner group ($M = 2.85$) than the others: (a) master ($M = 2.34$), (b) advanced ($M = 2.49$), and (c) intermediate ($M = 2.44$). Considering that virtual golf focuses on recreational features that might not require a high level of exercise, a possible reason for the result could be general preconceptions that golf is not easy to play. Knowing that consumers with lower skill levels might be the most significant target population to expand the fan base of virtual golf, additional efforts are required. Specifically, the virtual golf industry could offer easier game formats for lower mastery groups and could emphasize entertainment aspects by adding more diverse services in virtual golf facilities.

Research Question 5

The last research question investigated the structural relationships among various constructs (i.e., core service, peripheral service, perceived value, consumer satisfaction, and behavioral intentions) in terms of consumer behaviors in virtual golf. While the previous four research questions focused on consumer characteristics, the fifth research question explored consumer behaviors during and after participating in virtual golf. Given that maintaining existing consumers is essential in an emerging sport, the

significance of this analysis should be highlighted. The reason the analysis is vital is that the factors were interrelated, and had a great influence on each other (Yu et al., 2014). That is, service quality influenced consumers' dissatisfaction/satisfaction (Yiannakis, 1989), perceived value was a significant mediator between service quality and consumer satisfaction (Murray & Howat, 2002), and consumer satisfaction, which might be the most essential element in consumer behavior, tended to have positive effects on future behavior intentions of consumers (Yu et al., 2014). The current study generated noticeable findings within the structural relationships among constructs.

The results revealed all of the variables had significant direct and indirect effects on given latent variables (i.e., perceived value, consumer satisfaction, or behavioral intentions), but there were no significant effects of peripheral service on perceived value and consumer satisfaction. Specifically, the findings showed that (a) core service played a vital role in establishing favorable perceived value and consumer satisfaction directly and indirectly, (b) reasonable price (perceived value) of virtual golf could be an important cause of favorable consumer satisfaction, (c) the higher the consumer satisfaction, the more positive behavior intentions, and (d) peripheral service did not have any influences on perceived value and consumer satisfaction. Notable from these findings, there was no leverage of peripheral service anywhere in the structural model of consumer behaviors in virtual golf. A plausible reason would be that consumers might focus on more practical factors (i.e., pricing) or more direct factors (i.e., core service) in the service environment. The role of secondary (peripheral) services, which might not be closely related to playing virtual golf, could be smaller than expected due to the nature of virtual golf. The kinds of services that might be provided in a virtual golf center are very limited. Thus, efforts to

find a way to increase the quality and identify roles for peripheral service are required.

Implications of this Study

The following section addresses theoretical and practical implications of this study. This will include how the results could be compared with previous literature focusing on leisure constraints and consumer behaviors in the sport industry generally, and as practical implications of the findings for sport managers

Theoretical Implications

Leisure constraints. The factor structures of constraints in actual and virtual golf were the same regardless of the type of golf. Specifically, seven factors (i.e., social, health, skill, confidence, cost, weather, and time) identified in the previous literature (Jun & Kyle, 2011a) were reduced to six factors by combining the factors of skill and confidence in both settings. Empirical evidence from existing literature (LaForge-Mackenzie & Sullivan, 2014) indicated that self-efficacy (confidence) and performance (skill) had a positive relationship in sport. In other words, the better one performs a sport skill, the more confident s/he feels when participating in that sport. Furthermore, one study (Beattie, Fakehy, & Woodman, 2014) reported a reciprocal relationship between self-efficacy (confidence) and performance (skill) for recreational golfers. Regardless of the empirical evidence from previous research, it may be generally understandable that an individual with a higher level of skill in a certain sport has a relatively higher level of confidence playing the sport than those with lower skill levels.

Nevertheless, there were differences from a psychological perspective in consumers' participation constraints between the two different types of golf. Virtual golf and actual golf are independent genres of the sport, applying completely different

platforms (reality vs. virtual reality). Thus, to understand consumer behaviors of various types of sports, it is necessary to have a wider range of marketing perspectives.

Fundamental differences between actual and virtual reality might result in different consumer experiences, which would be consistent with the argument that there were significant differences between existing and emerging sports (Ko et al., 2008). In the same vein, the current study would have theoretical contributions.

Additionally, this study confirmed the importance of experience in individuals' leisure participation, aligning with the previous literature indicating significant differences between continuous participants and new participants on several factors (e.g., cost, social, skill, and so on) (Jackson & Dunn, 1991; Jackson & Rucks, 1993).

Participants with different golf experiences had different participation constraints in this study. The disparity based on experience was found again in analyses through demographic and golfographic information. These results were consistent with previous literature that found each individual's consumer behavior might vary based on subjective personal consumption experience (Petrick et al., 1999). In the same vein, the current study also found that consumer segmentation is useful in investigating consumer behaviors (Greenwell et al., 2002b).

There was a finding in this study contrary to previous literature. From initial leisure research to recent literature in sport, most researchers have emphasized the role of individuals' psychological and social factors (Crawford & Godbey, 1987; Hubbard & Mannell, 2001; Iso-Ahola & Mannell, 1985; Jun & Kyle, 2011a; Lyu et al., 2013). While existing literature focused on interpersonal (e.g., relationship with family or friends) and intrapersonal factors (e.g., stress or depression), the role of structural constraints (e.g.,

financial resources, weather, or time) was highlighted more than the others in this study. The result of the current study indicated that the factors of cost and time were relatively more significant than the others (social, health, and skill/confidence). Thus, the theoretical approaches focusing on consumer behaviors should be applied with changing social attitudes to minimize the gap between theory and practice.

As a result, there were differences and similarities between actual and virtual golf, and agreements and disagreements between the current study and previous literature. In other words, consumers regarded virtual golf as an independent sport genre that differs from actual golf from a technical perspective. Furthermore, the current study not only shared implications with previous leisure research, but also revealed new findings that might have theoretical contributions in future leisure studies.

Service, perceived value, consumer satisfaction, and behavioral intentions.

The factor structure used to understand consumer behaviors in virtual golf confirmed five final factors (core service, peripheral service, perceived value, consumer satisfaction, and behavioral intentions). The noticeable finding was that the existing factor of service quality was reconstructed as "core service and peripheral service" based on characteristics of the items belonging in each factor. Nevertheless, considering that all items of service quality still kept their structure within the factor of service quality after the EFA, there was no significant structural change. Given that the two factors of staff and facility in the previous literature were defined under the concept of service quality (Alexandris et al., 2004), those might be constructed from a service provider's perspective. However, according to the results of the factor analysis in this study, virtual golf consumers seemed to define the concept of service quality from a slightly different perspective. The structure

of service quality was reconstructed not from a service provider's perspective, but from a consumer's perspective. This interpretation could indicate that consumer behaviors have to be investigated on a consumer level, as opposed to a provider level, to have better insights.

Within the structural model, the first two considerable constructs were core service and peripheral service. The noticeable difference between the two factors was that while core service directly and indirectly impacted consumer satisfaction and perceived value, peripheral service had no effects on other factors. The result was consistent with Howat et al. (1999) where core service had a significant effect on service quality, but peripheral service did not, suggesting peripheral service could be considered a secondary factor in understanding consumer behaviors. Conversely, the results were not consistent with Yosuke et al. (2007) where peripheral service had a significant direct effect on consumer satisfaction as much as core service did.

The concept of service quality might vary depending upon different service environments (Ko & Pastore, 2004). In this study investigating virtual golf, a possible reason might be that virtual golf participants focused on core factors that might directly affect their leisure participation, while secondary factors not affecting actually playing virtual golf did not significantly influence perceived value and consumer satisfaction. Therefore, core service, which had significant effects on other factors, would have to be examined theoretically and be strengthened practically to raise the degree of consumer satisfaction.

The second significant structural relationship involved perceived value. The result in this study that perceived value had a significant direct effect on consumer satisfaction

was consistent with previous literature (Cronin et al., 2000; Yu et al., 2014). Furthermore, as mentioned above, core service only had an indirect effect on consumer satisfaction via the mediating role of perceived value. That was a direct example indicating the role of perceived value in the consumer decision-making process in virtual golf. Previous researchers (Cronin et al., 2000; McDougall & Levesque, 2000; Murray & Howat, 2002; Yu et al., 2014) indicated the relative attributes of perceived value. Zeithaml (1988) argued that perceived value could be measured by comparing "what is received and what is given" (p. 14) from the consumers' perspective. Yu et al. (2014) stated that the differences between costs and benefits influence perceived value. As such, perceived value has to be a mediator within the structural model in this study. Compared to actual golf in the Republic of Korea, the fact that virtual golf offers relatively reasonable pricing would be seen as positive. Although the results in this study did not reveal that negative service quality was significantly mediated by positive perceived value, perceived value was positively correlated with all other factors in this analysis. The strategy that virtual golf was invented to enjoy golf without financial burden (Choe, 2008) might therefore align closely with consumer behaviors.

The last significant relationship was a path between consumer satisfaction and behavioral intentions. Consistent with the findings in previous literature (Murray & Howat, 2002; Howat et al., 1999; McDougall & Levesque, 2000), the current study found the strongest direct effect of consumer satisfaction on behavioral intentions when compared with other factors in virtual golf. Generally, the construct of consumer satisfaction has been considered the most essential element in understanding consumer behaviors (Yu et al., 2014). The importance of consumer satisfaction could be seen from a

statement that "loyal customers are not necessarily satisfied customers but satisfied customers tend to be loyal customers" (Fornell, 1992, p.7). Churchill and Surprenant (1982) also argued that the perception of consumer satisfaction was significantly associated with consumers' purchase and re-purchase. In light of the extent of the correlation, McDougall and Levesque (2000) indicated that those two constructs (consumer satisfaction and behavioral intentions) should be considered simultaneously. Even if there was no assurance that a satisfied customer will return, and a dissatisfied customer will not return (Petrick et al., 1999), it is evident that the construct of consumer satisfaction plays an important role in choosing to participate in virtual golf.

In sum, considering that the current study found differences and similarities from previous research from a theoretical perspective, these findings contribute to further development of leisure studies including virtual sports.

Practical Implications

Through five research questions using various analyses with participants with diverse golf experiences, this study found differences among individuals and the extent to which factors related to consumer behaviors might play a significant role in leisure participation. Based on empirical evidence, practical implications of this study contribute to further development of virtual golf.

Since virtual golf is an emerging sport that needs to expand its fan base, consumer segmentation based on personal characteristics is essential in investigating consumer behaviors. The statement is consistent with previous research that different individuals might perceive sport-related consumption differently (Greenwell et al., 2002b). Investigations examining homogenous consumer groups sharing similar perspectives are

a way to better understand consumption (Jun et al., 2009). In the same vein, this study provides a better understanding of what prevents the following groups from participating more: (a) higher age group, (b) females, (c) individuals with low household income, and (d) beginners with a low level of skill in virtual golf.

First, results of this study indicated a low participation rate in the higher age group. Various reasons may contribute to this result, but the most persuasive may be unfamiliarity with technology. Considering that previous research in technology-based sport (Kim & Ross, 2006) had 74% of participants under 30, the low average age of this study in virtual golf is a logical finding. Furthermore, another reason could be the relative financial stability of the higher age group. Given that the reasonable pricing of virtual golf might not be attractive to this age group, virtual golf itself might not be as attractive. In other words, cost constraints could be both the biggest strength of virtual golf and the biggest weakness of actual golf. For this age group then, service providers should perhaps therefore focus on benefits of virtual golf, such as eliminating weather as a constraint. In the Republic of Korea with cold winters, the benefit of playing virtual golf indoor in bad weather might be attractive for the higher age group.

Next, the majority of survey participants in this study were male ($n = 300$, 77.1%) . While the proportion of female respondents in the group who never played either virtual or actual golf was close to half ($n = 44$, 40%), the female respondents in the group who had experience in any golf context was relatively low ($n = 45$, 22%). In other words, considering that the proportion of females in a group not involved in any leisure activity was high regardless of golf context, leisure participation of females was remarkably lower than that of males. Out of 209 respondents with experience playing

virtual golf, only 24 participants were females (11%). Existing research related to golf (Petrick & Backman, 2002; Jun & Kyle, 2011a, 2011b) and technology-based sports (Kim & Ross, 2006) was greatly weighted toward male participants. Furthermore, previous research regarding virtual golf indicated that nearly 70% of total participants were male (Han et al., 2014; Lee et al., 2012). A recent survey implemented by a leading virtual golf company in the Republic of Korea indicated female consumers of virtual golf also captured 21% of the total virtual golf population in the Republic of Korea (Lee, 2010). Therefore, a plausible rationale could be that the golf population in the Republic of Korea reflects the proportion of female participants (22.9%) in this study. Thus, service providers in virtual golf could establish marketing strategies focusing on a concept of "family" to capture female consumers who could be the biggest potential customer group in virtual golf.

Third, even if virtual golf was invented for beginners in an attempt to minimize financial burdens (Choe, 2008), the results of this study revealed that participation rates by the low household income group and the beginner group were very low. Those two groups face the most limitations to participating in any leisure activity. Since virtual golf is a genre of the sport "golf," there may be expectations of a certain amount of skill and expense. This would mean virtual golf may not be an attractive option for individuals with low income or skill levels. From a slightly different marketing perspective, however, the low income group might potentially be one of the most important consumer groups. The entertainment elements in virtual golf and reasonable pricing compared to actual golf creates opportunities to attract potential consumers. Therefore, service providers could use more diverse payment plans to attract consumers from various consumer classes.

Future Research

The current study provided various understandings in terms of a technology-based virtual sport from a marketing perspective. The results of this study contribute to the development of a newly emerging sport business. Considering a given study could not examine everything, further research is necessary. This study was no exception, so the following section will address suggestions for future study.

Previous research (Alexandris et al., 2011; Petrick et al., 2001; Zhang, 2007) in sport marketing and leisure studies applied consumers' motivation with constraints in order to investigate consumer behaviors from diverse perspectives. In the same vein, future studies focusing on reasons why individuals play virtual golf (participation motives) would result in generating strategies for sport managers to encourage potential consumers to participate in virtual sport. Furthermore, the results also provide some direction to understand which factors should be strengthened to increase participation by existing consumers,. Additional research efforts would address the limitations of the current study and minimize research gaps. If the results of future study were different from those of previous literature, the theoretical and practical implications would be especially meaningful.

Additionally, given virtual golf is a sport genre combining a sport and virtual reality, it is necessary to investigate a factor related to virtual reality or advanced technology. Young and Pedersen (2010) applied the factor of appearance (visual factors of a website) to examine service quality perceptions of online fantasy sport fans, and found that participants who were satisfied by websites were more likely to access those websites. In the same vein, given that customer response to virtual reality would be a

significant factor in understanding consumer behaviors in virtual sports, new scale development for virtual sports would be a opportunity to investigate the effect of virtual reality in detail from consumers' perspectives. Furthermore, the results of future study with newly developed scales would be better resources to understand and develop virtual sports.

Next, the current study generated several findings by comparing groups (i.e., virtual golf experience, household income, and mastery). While this study compared actual and virtual golf, further research could look at differences in similar technology-based sport industries such as internet or video gaming. Even if new technology-based sport industries are built on the same sport, consumers would have various experiences through totally different platforms (i.e., internet, video, and virtual reality). Moreover, considering that sport businesses utilizing advanced technology may share a relatively similar target population and marketing strategies with virtual sport, the results would provide significant information to managers in the virtual sport industry.

In addition to comparing different types of sport businesses, diversifying the research population and sample would be necessary. Virtual golf has experienced dramatic growth in the Republic of Korea, but future studies with more diverse global consumer samples could be meaningful. Especially, it is necessary to look at countries with similar weather conditions (e.g. long and cold winter), city environment (e.g. crowded megacities), and golf industrial situation (e.g. relatively expensive rate) like the Republic of Korea. Knowing that technology minimizes leisure participation constraints, as the current study found, a wide range of research subjects would be essential. In the same vein, in terms of demographic information, meaningful approaches for future

studies might be also feasible. The current study investigated the effect of household income on leisure constraints in virtual golf, but as mentioned earlier, the majority of study participants were males, and a relatively very small number of females participated in this study. Future studies could discuss why this disparity exists, whether this may mirror the golf population, and how the gender differences in the golf industry could be explained. Additionally, other demographic factors (i.e., age) might be significant to examine as well.

From a statistical standpoint, although this study utilized reliable and valid instruments from previous literature (Alexandris et al., 2004; Cronin et al., 2000; Jun & Kyle, 2011a; Ko & Pastore, 2007; Sweeney & Soutar, 2001) modifying statistical tests in various ways and also scale development to help study a sport with virtual reality would be essential. The newly developed instruments would be standards for research in virtual sport. Furthermore, from a research design standpoint, this study applied a quantitative design to understand individuals' opinions and behaviors (Creswell, 2008). However, to understand individuals' complex psychological status, the strengths of qualitative research design would provide in-depth and more detailed information of consumer behaviors from a different point of view.

Summary of Study

Today, advanced technology has not only brought about dramatic changes in consumption patterns but also has generated new types of sports. Emerging sport-related businesses using virtual reality are attracting more customers (Choe, 2008), than actual golf (Han et al., 2014). In that sense, the current study investigated the consumer behaviors of virtual golf by exploring leisure constraints, service quality, perceived value,

consumer satisfaction, behavioral intentions through comparative and empirical approaches. The collected data from existing and potential consumers in virtual golf were analyzed through EFAs, descriptive statistics, a set of paired samples of *t* tests, a series of Multivariate Analysis of Variance (MANOVA), and Structural Equation Modeling (SEM) to address five research questions to better understanding consumer behaviors in virtual golf.

Specifically, this study found significant participation constraints differences between actual and virtual golf on cost, weather, time, and skill/confidence constraints. Also, an individual's golf experience was a significant variable in leisure participation, and individuals who never played virtual golf faced participation constraints regarding social, cost, time, and skill/confidence. Moreover, the lower the participants' income level was, the more their participation was constrained by four constraints (social, cost, time, and skill/confidence). Similarly, the lower the mastery level was, the more the participation in virtual golf was limited by two constraints (cost and skill/confidence). Lastly, while four factors (core service, perceived value, consumer satisfaction, and behavioral intentions) had significant effects on given factors in consumer behaviors, peripheral service had no effects anywhere in this study.

The current study provided a comprehensive understanding of consumer behaviors in virtual golf, a newly emerging sport-related business with enormous potential from a marketing perspective. Specifically, given that the current study focused on the consumers' complex decision-making process, the findings provide deeper insights for practitioners and researchers in sport management. Hence, by expanding the literature regarding leisure constraints, service quality, perceived value, consumer satisfaction, and

behavioral intentions, the results of this study contribute to future research in consumer behavior regarding technology-driven sport industries striving to attract potential consumers and maintain existing consumers.

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APPENDIX A

Demographic and Golfographic Information

Please answer the following questions by placing a mark or circle on the appropriate box.

1. Which one of the following golf contexts have you experienced?
☐ Only played golf on an outdoor course ☐ Only played screen golf
☐ Both ☐ Neither

1-1. How frequently do you play golf (outdoor) per month?
☐ More than five times ☐ three or four times
☐ one or two times ☐ less than once ☐ None

1-2. How frequently do you play screen golf per month?
☐ More than five times ☐ three or four times
☐ one or two times ☐ less than once ☐ None
2. What is your gender? ☐ Male ☐ Female
3. What is your age? (_____)
4. What is your marital/household status?
☐ Single ☐ Married ☐ Divorced ☐ Widowed
5. What is your highest level of educational completed?
☐ Elementary ☐ Middle School ☐ High School
☐ Bachelor's Degree ☐ Master's Degree ☐ Doctorate Degree
6. What is your annual household income? (Unit: KRW 10,000)
☐ Less than KRW 2,499 ☐ From KRW 2,500 to KRW 4,999
☐ From KRW 5,000 to KRW 7,499 ☐ From KRW 7,500 to KRW 9,999
☐ More than KRW 10,000
7. What is your average golf score?
☐ less than 81 ☐ 82 - 90
☐ 91 - 99 ☐ greater than 100 ☐ I don't know
8. What is your average screen golf score?
☐ less than 81 ☐ 82 - 90
☐ 91 - 99 ☐ greater than 100 ☐ I don't know

Leisure Participation Constraints in Actual Golf

Instruction: Listed below are a series of statements that describe your behavior regarding **golf (outdoor)** in the Republic of Korea. Please read each statement and then circle the appropriate number to indicate how much you agree or disagree with the statements.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree
<hr/> <i>Social</i>						
• My friends don't want me to play golf					1 2 3 4 5 6 7	
• I don't have friends to play golf with					1 2 3 4 5 6 7	
• My friends have different interests other than golf					1 2 3 4 5 6 7	
<hr/> <i>Health</i>						
• Health problems prevent me from playing golf					1 2 3 4 5 6 7	
• I don't have the energy to play golf					1 2 3 4 5 6 7	
• I am not fit enough to play golf					1 2 3 4 5 6 7	
<hr/> <i>Skill/Confidence</i>						
• The game is too difficult					1 2 3 4 5 6 7	
• I am not experienced					1 2 3 4 5 6 7	
• My game is too inconsistent					1 2 3 4 5 6 7	
• I fear embarrassing myself					1 2 3 4 5 6 7	
• I get frustrated easily					1 2 3 4 5 6 7	
• I find my game inadequate in the company of others					1 2 3 4 5 6 7	
• I believe I am not a good golfer					1 2 3 4 5 6 7	
• I am not very good at playing golf					1 2 3 4 5 6 7	
<hr/> <i>Cost</i>						
• I don't have enough money to play golf					1 2 3 4 5 6 7	
• I cannot afford the green fees					1 2 3 4 5 6 7	
• Equipment is too expensive					1 2 3 4 5 6 7	
• Cost of green fees is too expensive					1 2 3 4 5 6 7	
<hr/> <i>Weather</i>						
• I do not enjoy playing golf in hot weather					1 2 3 4 5 6 7	
• I do not enjoy playing golf in cold weather					1 2 3 4 5 6 7	
• I do not enjoy playing golf in rainy weather					1 2 3 4 5 6 7	
<hr/> <i>Time</i>						
• Playing golf takes too long					1 2 3 4 5 6 7	
• I have no time to play golf					1 2 3 4 5 6 7	
• It is difficult to find the time to play golf					1 2 3 4 5 6 7	

Leisure Participation Constraint in Virtual Golf

Instruction: Listed below are a series of statements that describe your behavior regarding **screen golf** in the Republic of Korea. Please read each statement and then circle the appropriate number to indicate how much you agree or disagree with the statements.

	1	2	3	4	5	6	7
	Strongly Disagree			Neutral			Strongly Agree
<i>Social</i>							
• My friends don't want me to play screen golf	1	2	3	4	5	6	7
• I don't have friends to play screen golf with	1	2	3	4	5	6	7
• My friends have different interests other than screen golf	1	2	3	4	5	6	7
<i>Health</i>							
• Health problems prevent me from playing screen golf	1	2	3	4	5	6	7
• I don't have the energy to play screen golf	1	2	3	4	5	6	7
• I am not fit enough to play screen golf	1	2	3	4	5	6	7
<i>Skill/Confidence</i>							
• The game is too difficult	1	2	3	4	5	6	7
• I am not experienced	1	2	3	4	5	6	7
• My game is too inconsistent	1	2	3	4	5	6	7
• I fear embarrassing myself	1	2	3	4	5	6	7
• I get frustrated easily	1	2	3	4	5	6	7
• I find my game inadequate in the company of others	1	2	3	4	5	6	7
• I believe I am not a good golfer	1	2	3	4	5	6	7
• I am not very good at playing screen golf	1	2	3	4	5	6	7
<i>Cost</i>							
• I don't have enough money to play screen golf	1	2	3	4	5	6	7
• I cannot afford fee for entry	1	2	3	4	5	6	7
• Equipment is too expensive	1	2	3	4	5	6	7
• Cost of fee for entry is too expensive	1	2	3	4	5	6	7
<i>Weather</i>							
• I do not enjoy playing screen golf in hot weather	1	2	3	4	5	6	7
• I do not enjoy playing screen golf in cold weather	1	2	3	4	5	6	7
• I do not enjoy playing screen golf in rainy weather	1	2	3	4	5	6	7
<i>Time</i>							
• Playing screen golf takes too long	1	2	3	4	5	6	7
• I have no time to play screen golf	1	2	3	4	5	6	7
• It is difficult to find the time to play screen golf	1	2	3	4	5	6	7

Consumer Behaviors in Virtual Golf

Instruction: (*For only individuals who have experiences playing screen golf in Korea*)

Listed below are a series of statements that describe your behavior regarding screen golf in the Republic of Korea. Please read each statement and then circle the appropriate number to indicate how much you agree or disagree with the statements. Be sure that your answer should be based on your experience of screen golf in the Republic of Korea.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

Core Service

- | | | | | | | | |
|------------------------------------|---|---|---|---|---|---|---|
| • Are reliable | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| • Are knowledgeable | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| • Provide individualized attention | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| • Equipment are well-maintained | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Peripheral Service

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| • Respond quickly to consumers' requirements | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| • Work enthusiastically | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| • Are polite | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Perceived Value

- | | | | | | | | |
|-----------------------------------|---|---|---|---|---|---|---|
| • Is reasonably priced | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| • Offers high value for money | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| • Is a good service for the price | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| • Would be economical | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Consumer Satisfaction

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| • I am satisfied with my decision to play screen golf | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| • I am happy about my decision to play screen golf | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| • I believe I did the right thing when I decided to participate in screen golf | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Behavioral Intentions

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| • The probability that I will use this facility's services again | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| • The likelihood that I would recommend this facility's services to a friend | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| • If I had to do it over again, I would make the same choice | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
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CURRICULUM VITA

CHULHWAN CHOI
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EDUCATION

- Ph.D. 2016/05 University of Louisville
*Doctor of Philosophy in Educational Leadership and
Organizational Development*
Specialization: Sport Administration
- M.S. 2010/05 State University of New York College at Cortland
Master of Science in International Sport Management
- B.A. 2007/02 Kyung Hee University, Republic of Korea
Bachelor of Science in Golf Management
Concentrations: Golf and Sport Marketing

PROFESSIONAL EXPERIENCE

- Woodhaven Country Club, Louisville, KY, 2011 - 2012
Staff (Tournament Operations, Merchandising, and Instruction)
- Military Service, Social Welfare Division 2003 - 2006
Corporal (Helped administrative works at the government welfare
facility)
- Tee Golf Studio (Sport Event Management Company), Republic of Korea, 2003
Associate, Vice Manager, Marshall, Marketing Team
- Audi Quattro Cup - East Valley Country Club
 - Audi Quattro Cup - A-One Country Club
 - Audi Quattro Cup - Edinburgh Country Club
 - Audi Quattro Cup - Namchon Country Club
 - Audi Quattro Cup - Daegu Country Club
 - Giheung C.C. Championship - Gigeung Country Club
 - SK Telecom Open - KPGA Official Golf Competition

RESEARCH

A. Publications and Works in progress

Choi, C., & Greenwell, T. C. (In review). A comparative approach to a whole new type of sport entertainment through virtual reality. To be submitted to *International Journal of Sports Marketing & Sponsorship*.

Choi, C., Kang, S. J., Itoh, M., & Hambrick, M. E. (In review). Exploring students' motivation and commitment to sport management major. To be submitted to *Sport Management Education Journal*.

Choi, C., & Greenwell, T. C. (In progress). Virtual reality more realistic than reality: Effects of service quality, perceived value, consumer satisfaction on behavioral intentions in virtual golf. To be submitted to *European sport management quarterly*.

Choi, C., Park, J., Yoo, S., & Greenwell, T. C. (In progress). Virtuality like reality: Constraints, negotiation, negotiation-efficacy, and participation in virtual golf. To be submitted to *International journal of sports marketing & sponsorship*.

Frimming, R. E., Bower, G. G., & **Chulhwan, C.** (2013). Examination of a physical education personal health science course: Face-to-face classroom compared to online hybrid instruction. *The Physical Educator*, 70(4), 359-373.

B. Presentations

Choi, C., Park, J., Yoo, S., & Greenwell, T. C. (In review). *Virtuality like reality: Constraints, negotiation, negotiation-efficacy, and participation in virtual golf*. Submitted to present at the 2016 Sport Marketing Association Conference, Indianapolis, IN

Choi, C., & Greenwell, T. C. (2016). *A comparative approach to a whole new type of sport entertainment through virtual reality*. Presented at the 2016 Pennsylvania Sports Business Conference, Indiana, PA

Choi, C., & Greenwell, T. C. (2016). *Virtual reality more realistic than reality: Effects of service quality, perceived value, consumer satisfaction on behavioral intentions in virtual golf*. Presented at the Applied Sport Management Association Conference, Baton Rouge, LA

Choi, C. (2015). *Leisure constraints on virtual golf*. Presented at the 2015 Spring Research Conference, Louisville KY.

Choi, C., Kang, S. J., Itoh, M., Lee, C. H., & Hambrick, M. E. (2012). *Exploring students' motivation and commitment to sport management major*. Presented at the annual conference of the North America Society for Sport Management, Seattle WA.

Ha, J., **Choi, C.**, Han, K., & Greenwell, T. C. (2012). *Online sport consumption motives: Why does an ethnic minority group consume sports in a native and host country through the internet?*. Presented at the annual conference of the North America Society for Sport Management, Seattle WA.

Choi, C. (2011). *Sport for development and peace: Developing sport programs for people with disabilities*. Presented at the 2011 Olympian I.D.E.A.L.S. Festival, Louisville KY.

TEACHING

A. Primary Instructor

University of Louisville, Sport Administration Program, Louisville, KY
- HSS 114-03: Fitness Walking (Spring 2016)

University of Louisville, Sport Administration Program, Louisville, KY
- HSS 125-96: Golf (Spring 2012, Fall 2011, & Spring 2011)

B. Guest Lectures

Performance appraisals (2012, November 27). SPAD 382 Organizational Behavior, University of Louisville. Louisville, KY.

Korean sports (2012, March 7). SPAD 509 International sport, University of Louisville. Louisville, KY.

SERVICE

2016	Volunteer, 2016 Grawemeyer Awards The Anniversary Celebration Education Award Symposium University of Louisville, Louisville, Kentucky
2015	Abstract Reviewer, Journal of Sport
2012	Abstract Reviewer, Spring Research Conference University of Louisville, Louisville, KY
2000-2001	General Manager, Kyung Hee University Golf Invitational Kyung Hee University, Republic of Korea
2000-2001	Associate, University Sport Event Management Team Kyung Hee University, Republic of Korea

FUNDING ACTIVITIES

Choi, C. (2016 Spring) Travel to Baton Rouge, LA for the 2016 Applied Sport Management Conference. Funded by the Graduate Student Council, University of Louisville in the amount of \$350

Choi, C. (2016 Spring) Travel to Baton Rouge, LA for the 2016 Applied Sport Management Conference. Funded by the Department of Health and Sport Sciences, University of Louisville in the amount of \$100

Choi, C. (2012 Fall). International Student Tuition Support. Funded by the University of Louisville International Center in the amount of \$500

Choi, C. (2012 Summer). Honors and Scholarship. Funded by the University of Louisville College of Education and Human Development in the amount of \$1,617

Choi, C. (2012 Spring). International Student Tuition Support. Funded by the University of Louisville International Center in the amount of \$500

Choi, C. (2011 Fall). Samuels Fellowship. Funded by the University of Louisville College of Education and Human Development in the amount of \$1,000

Choi, C. (2011 Fall). International Student Tuition Support. Funded by the University of Louisville International Center in the amount of \$500

ACADEMIC HONORS

2010 The Highest GPA Sport Management Graduate. Awarded by State University of New York at Cortland (3.83 out of 4.0).

2006 Academic Excellence Full Tuition Scholarship with Perfect GPA (4.3 out of 4.3). Funded by the Kyung Hee University in the amount of \$3,500.

2003 Academic Honors Scholarship. Funded by the Kyung Hee University in the amount of \$1,000.

2001 Academic Honors Scholarship. Funded by the Kyung Hee University in the amount of \$1,000.

QUALIFICATIONS & LICENSES

United States Golf Teacher Federation (USGTF), 2012
Golf Teaching Professional Certification Level III

Microsoft Office Specialist (MOS), 2008

Korea Athletic Promotion Association, 2006

License of Child Physical Education Trainer Level I

License of Sports Massager Level I

PROFESSIONAL MEMBERSHIP

Member, North American Society for Sport Management (NASSM)

Member, Applied Sport Management Association (ASMA)

Member, Sport Marketing Association (SMA)

Member, United States Golf Teacher Federation (USGTF)