

Effects of service quality, perceived value, and consumer satisfaction on behavioral intentions in virtual golf

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Abstract:

In the sport industry, the latest technology has not only brought about dramatic changes in consumption patterns but has also generated new types of sports (Young & Pederson, 2010). For example, virtual golf, an emerging sport using virtual reality to simulate playing golf, allows consumers to experience a whole new type of sport related experience. Given the considerable differences in how virtual golf is delivered compared to traditional golf, a better understanding of how the service encounter influences key outcomes is essential to understand how to satisfy and retain consumers. A total of 209 virtual golf participants were surveyed, and structural equation modeling (SEM) was used to investigate relationships among core service, peripheral service, perceived value, customer satisfaction, and behavioral intentions. 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. These findings should contribute to further development of leisure studies involving virtual sports.

Key words: service quality, perceived value, consumer satisfaction, behavior intentions, virtual golf

Introduction

Rapid technological advances have altered fantasy into reality, and computer-based environments have enabled individuals to experience virtual reality. In the sport industry, advancing technology has drastically changed an individual's consumption pattern by offering diverse options to enjoy sports (Young & Pederson, 2010) such as video games or fantasy sports. Virtual golf, golf through a virtual reality simulator, has attracted consumers and has experienced outstanding growth, even threatening the popularity of outdoor golf. Even though virtual golf is based on an existing sport (golf), virtual reality allows customers to experience a new sport entertainment genre. Thus, as an independent genre in sport industry, it is necessary to explore consumer behaviors unique to the sport, as applying previous results of leisure research to virtual golf would be inadequate.

Investigating significant factors (service quality, perceived value, consumer satisfaction, and behavioral intentions) in a recreational leisure facility environment is crucial in that these factors are closely related to profitability of sports facilities (Yiannakis, 1989; Yu, Zhang, Kim, Chen, Henderson, Min, & Huang, 2014). Specifically, consumer satisfaction (Murray & Howat, 2002; Howat, Murray, & Crilley, 1999; McDougall & Levesque, 2000; Yu, et al., 2014) and service quality (Bitner & Hubbert, 1994; Howat, Crilley, Milne, & Absher, 1993; Ko & Pastore, 2004; Yiannakis, 1989) have been considered significant elements. In addition, the influence of perceived value on consumer behaviors gained attention in the sports industry as a mediator between service quality and consumer satisfaction (Cronin, Brady, & Hult, 2000; McDougall & Levesque, 2000; Murray & Howat, 2002; Petrick, Backman, & Bixler, 1999; Shukla, 2010; Yu et al., 2014; Zeithaml, 1988).

When it comes to the effect of virtual reality in the sport industry, a better understanding of how the service encounter influences key outcomes is essential to understand how to satisfy and retain consumers. Furthermore, by expanding the literature regarding service quality, perceived value, consumer satisfaction, and behavioral intentions, the results of this study should contribute to future research in consumer behavior regarding technology-driven sport industries striving to attract potential consumers and maintain existing consumers. Therefore, the primary purpose of this paper is to explore the relationships among service quality, perceived value, customer satisfaction, and behavioral intentions to understand consumers' decision-making processes and to suggest useful information to researchers and practitioners in the recreational sport industry.

Virtual Reality and Golf

The term of virtual reality has been used globally as “a predominantly visual-based computer simulation of a real or imaginary environment” (Craig, 2013, p. 164). In sport context, until recently the use of this highly advanced technology has been limited in ball sports in training specific skills and in implementing

virtual reality exercise (Miles, Pop, Watt, Lawrence, & John, 2012). Nevertheless, it is obvious that virtual reality has pushed forward the boundaries of a player's performance and has provided new directions in training athletes (Craig, 2013). Furthermore, virtual reality has become one of the advanced technologies more accessible to the public, and the first target market is golf.

Golf participation has been stagnant in the last 20 years (National Golf Foundation, 2015), as golf has been considered a time consuming and elite sport which might be hard to learn (Garvin, 2016; Powell, 2014). Golf participation is also hampered by location, time, and weather (Han, 2004; Petrick et al., 1999; Zhang, 2007). Meanwhile, virtual golf, which was invented to encourage beginners to play golf without any financial difficulties anywhere and whenever, has become one of the most popular sport-related businesses in the Republic of Korea as it satisfied desires of avid golfers experiencing limitations to playing golf (Choe, 2008; Kim, Seo, Kim, & Chang, 2014). Virtual golf, also known as screen golf, is enjoyed indoors with real golf clubs, balls and consumers' own swings in front of a high definition golf simulator, a sensor, and a computer graphics engine (Jung, Park, Kang, Lee, & Hahn, 2010).

Since a daily green fee costs approximately 200 US dollars to play golf in the Republic of Korea, virtual golf costing approximately 20 US dollars is an attractive option for avid golfers (The Korea Golf Association, 2014). Furthermore, given that virtual golf offers relatively easier format to play golf than the existing outdoor field golf (Choe, 2008), individuals with lower mastery in golf have enjoyed virtual golf without physiological burdens. In other words, by offering affordability and playability to consumers, virtual golf has threatened the actual sports industry in the Republic of Korea (The Korea Leisure Research Center, 2016). Since 2012, the world's first professional virtual golf tournament (G-Tour), has opened in the Republic of Korea on a nationwide scale (Noe, 2012), showing that the virtual golf industry was not a simple alternative which might overcome the limitations of outdoor golf, but a newly growing sport market which might have enormous potential. 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, Chung, & Lee, 2013). Given this emerging sport has received little attention from a marketing perspective, an investigation is warranted to see how advanced technology affects consumer behaviors in sport.

Service Quality

The concept of service quality, defined as overall subjective impression after consumption (Bitner & Hubbert, 1994), is important for consumers, researchers, and marketers alike (Howat et al., 1993). Since diverse consumers' tastes might exist in various service environments, research on service quality should be able to examine the unpredictability and diversity of consumer evaluation. Efforts to explore how service quality impacts consumers' dissatisfaction and satisfaction in recreational leisure facility environments is vital to sport managers because those factors were closely related to profitability of sport facilities (Yiannakis, 1989). That is, service quality is the most essential element in satisfying consumers, retaining individuals, and enhancing a consumer base (Yu et al., 2014). In the same vein, in the virtual golf industry, it is necessary to offer satisfactory services through advanced technology and well-trained service personnel to attract new consumers and retain current consumers. Therefore, the concept of service quality would play a vital role in investigating consumer behaviors in virtual golf from a marketing perspective and in looking for ways to provide better services to consumers (Murray & Howat, 2002).

Over the years, previous research has suggested service quality is impacted by both core (principal role functions) and peripheral (secondary services) elements (McDougall & Levesque, 2000). That is, while core elements in sport participation represent what is delivered, such as the activity, facility, and equipment, peripheral services represent how the service is delivered (McDougall & Levesque, 2000). Previous researchers (Byon, Zhang, & Baker, 2013) found that core and peripheral service quality had a vital role in consumer satisfaction and behavioral intentions of sport fans. However, given that relative impacts of diverse elements related to service quality tends to vary with the nature of the sport or activity (Ko & Pastore, 2004), it is necessary to investigate how each may impact consumer behaviors in a given sport context. In other words, it would be important to investigate which role service quality can do in an emerging sport using virtual reality and how virtual reality can change the existing concept of service quality.

Perceived Value

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). Perceived value can be measured by the difference between cost incurred by the consumer and benefits received (McDougall & Levesque, 2000; Yu et al., 2014). To respond to changes of business environment, consumer needs, or competitors, 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).

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). Considering disappointments about lower service quality compared with

consumers' expectations could be adjusted by positive influence via perceived value, perceived value would be a significant marketing resource. Therefore, service quality (core and peripheral in this study) and perceived value, which are causative factors in consumer satisfaction, should be positively related to satisfy consumers. Maintaining a positive relationship between two elements would be the most significant task in sport-related service industries. Likewise, perceived value in this study is also a crucial factor to satisfy virtual golf consumers. Considering that golfers playing on outdoor courses in the Republic of Korea pay relatively inflated costs (approximately 200 US dollars for a daily green) in accordance with government policy, perceived value may play a greater role in choosing to play virtual golf (approximately 20 US dollars for a round) (Choe, 2008; The Korea Golf Association, 2014). We hypothesize that core and peripheral service will influence perceived value.

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

H2: Peripheral service has a direct positive influence on perceived value

Consumer Satisfaction

Regardless of industry characteristics, the ultimate marketing goal would be to satisfy and retain consumers. Consumer satisfaction has been one of the most important concepts in marketing thought and practice, as satisfaction has been significantly associated with consumers' purchase, re-purchase, attitude, and brand loyalty (Carlson & O'Cass, 2010; Churchill & Surprenant, 1982; Lee & Kang, 2015; Yoshida & James, 2010). For virtual golf as a participation sport, 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 (Theodorakiset, Alexandris, Rodriguez, & Sarmiento, 2004). Previous research (Ko & Pastore, 2007; Kyle, Theodorakis, Karageorgiou, & Lafazani, 2010; Murray & Howat, 2002; 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, 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) which are formed in the unique nature of an emerging sport using virtual reality. We propose the following hypotheses.

H3: Core service has a direct positive influence on consumer satisfaction.

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

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

Behavioral Intentions

Previous research (Murray & Howat, 2002; Howat et al., 1999; McDougall & Levesque, 2000) has noted that consumers' behavioral intentions have been positively correlated with other factors such as service quality, perceived value, and consumer satisfaction. Particularly, according to Yu et al. (2014), customer satisfaction was the most significant factor on customers' behavioral intentions when compared with other factors. Considering that behavioral intentions have been acknowledged as a significant consequence to determine complex consumer behavior in participation sports (Du, Jordan, & Funk, 2015; Kaplanidou, Jordan, Funk, & Rindinger, 2012), the importance to investigate relationships among the factors would be vital. Similarly, Fornell (1992) argued that "loyal customers are not necessarily satisfied customers but satisfied customers tend to be loyal customers" (p. 7). That is, consumers determined their continuance or discontinuance after purchase based on their level of consumer satisfaction (Backman & Crompton, 1989). Therefore, considering that satisfied consumers tend to be more likely to have positive future intentions (Yu et al., 2014), the final hypothesis states that customers' satisfaction with their experiences will influence their behavioral intentions in participating in virtual golf, which is an emerging sport striving to enhance its fan base.

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

Methods

Participants

The target population for this study was individuals who have experience in golf in the Republic of Korea. The data collection was implemented at five virtual golf centers, two driving ranges, two outdoor golf country clubs, and a multi-purpose sports center with various facilities (e.g., a gym, swimming pool, indoor driving range, and restaurants). All study participants responded to a question about their golf experiences, and the answers were the criteria to determine who were appropriate in this study. A total of 550 questionnaires were distributed, and 412 questionnaires were returned (approximately 74.9% of response rate). Of that, a total of 209 questionnaires were utilized in this study after excluding 23 incomplete questionnaires and 180 questionnaires completed by individuals who had never played virtual golf.

Measures

Service quality. The current study applied a concept of service quality from previous studies (Alexandris, Zahariadis, Tsorbatzoudis, & Grouios, 2004a; 2004b) investigating perceived service quality of an

indoor leisure facility, corresponding with service environment of virtual golf. Specifically, the current research utilized three dimensions (i.e., responsiveness, personnel, and tangibles) in accord with the virtual golf context and excluded two dimensions (e.g., perceived outcome and reliability) since a virtual golf facility does not provide instructional programs. The three dimensions of service quality were measured with 9 items on a 7-point Likert-type scale. The items of Responsiveness (2 items) were "Respond quickly to consumers' requirements" and "Work enthusiastically." Next, the items of Personnel (4 items) were "Are polite," "Are reliable," "Are knowledgeable," and "Provide individualized attention." Lastly, the items of Tangibles (3 items) were "Equipment is well-maintained," "The atmosphere in the facility is attractive," and "Facility is clean."

Perceived value. 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). 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."

Consumer satisfaction. Consumer satisfaction was measured with 3 items on a 7 point Likert-type scale, developed by Ko and Pastore (2007). Those were "I am satisfied with my decision to play virtual golf," "I am happy about my decision to play virtual golf," and "I believe I did the right thing when I decided to play virtual golf."

Behavioral intentions. Behavioral intentions were measured with 3 items on a 7 point Likert-type scale, which were developed by Cronin et al. (2000). The items included "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."

Semantic Equivalence

In order to create a semantically equivalent survey instrument in Korean, the five steps recommended by Sousa and Rojjanasrirat (2011) were closely followed: (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 (62 useably completed surveys out of 91 surveys). Translation/back-translation procedures involved in these five steps technically ensured a semantic consistency by determining potential translation errors (Choi, Seo, Scott, & Martin, 2010). Four bilingual doctoral students in a sport management program were tasked in these steps.

Scale Validation

To ensure the instrument measured what it intended to measure, a series of pre-tests was performed to examine the reliability, validity, and readability of the instrument. Three steps, proposed by Dillman, Smyth, and Christian (2008), were conducted so that each step evaluated what the other steps could not: (a) panel of experts, (b) field test, and (c) pilot study.

As the first step of instrument pre-tests, 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 to get feedback on content validity and readability. Following the reviews of experts, a field test was conducted via telephone interviews as suggested by Dillman (2007). The participants in this step were five graduate students, who were physically located in the Republic of Korea during the period of data collection, 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.

Finally, following modifications of the survey instrument based on feedback from the panel of experts and the field test, a pilot study was performed through internet-based surveys to ensure scale reliability. Closely observing parallel 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. Preliminary analysis of the 62 completed surveys (out of 91) yielded acceptable levels of internal consistency reliability coefficients, which ranged from .756 to .926 including staff ($\alpha = .756$), facility ($\alpha = .778$), perceived value ($\alpha = .844$), consumer satisfaction ($\alpha = .881$), and behavioral intentions ($\alpha = .926$).

Results

The final sample consisted of 185 (88.5%) males and 24 (11.5%) females, which is similar to existing research related to golf (Jun & Kyle, 2011a, 2011b) and technology-based sports (Ko & Ross, 2006). Furthermore, previous research in virtual golf indicated that nearly 70% to 80% of total participants were male (Han, Beak, Lee, & Huh, 2014; Lee, 2010; Lee et al., 2013). Respondents' ages ranged from 21 to 75 years old with a mean age of 40.25 ($SD = 11.30$). Approximately 78% ($n = 163$) of the sample was under 49 years old and 66% were married ($n = 137$). A majority of the participants had a Bachelor's degree ($n = 133, 63.6%$), followed by a master's degree ($n = 53, 25.4%$), a high school degree ($n = 17, 8.1%$), and a doctorate degree ($n = 6, 2.9%$).

Finally, approximately 77% of the sample reported household incomes over 50 million Korean won (approximately USD 43,000).

Factor Structure of Consumer Behaviors in Virtual Golf

To select indicator variables for the five constructs used in SEM, a principal component analysis (PCA) with orthogonal rotation (Varimax) was conducted on the correlations of the 19 items measuring consumer behaviors in virtual golf. 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, further indicating the data were appropriate for a factor analysis. The extracted communalities were generated to reflect the proportion of variance explained by the retained factors, and the values ranged from .597 to .894. To decide on how many components to retain, this study applied three criteria: (a) eigenvalue greater than 1.0, (b) parallel analysis, and (c) the amount of total variance explained by factors (greater than 70%) (Stevens, 2009). Based on the three criteria, five factors, explaining 77% of total variance and greater than 1.0 eigenvalue, were retained.

On the first factor, six items loaded significantly, which accounted for approximately 41% of the total variance post rotation. The items with significant factor structure coefficients on this factor included "Provide individualized attention," "Are knowledgeable," "Are Reliable," "Equipment is well-maintained," "The atmosphere in the facility is attractive," and "Facility is clean." Of the six items, the four items with the largest factor structure coefficients reflected pivotal aspects of service quality (named "core service" in this study) in virtual golf. Thus, these four items were served as four indicator variables in subsequent analyses. On the second factor (perceived value), four items loaded significantly, which explained approximately 14% of the total variance, including "Is reasonably priced," "Offers high value for money," "Is a good product for the price," and "Would be economical." On the third factor (behavioral intentions), three items loaded significantly, which explained approximately 9% of the total variance, including "I am satisfied with my decision to play virtual golf," "I am happy about my decision to play virtual golf," and "I believe I did the right thing when I decided to play virtual golf." On the fourth factor (consumer satisfaction), three items loaded significantly, which explained approximately 8% of the total variance, including "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." On the fifth factor, three items loaded significantly, which explained 5% of the total variance. The three items included "Respond quickly to consumers' requirements," "Work enthusiastically," and "Are polite," reflecting subjective and personal aspects of service quality (named "peripheral service" in this study) in a virtual golf center (Table 1).

Table 1. *Factor Loadings (β), Alpha Coefficients (α), Means (M) and Standard Deviations (SD) for Core Service, Perceived Value, Behavioral Intentions, Consumer Satisfaction, and Peripheral Service in Virtual Golf*

Variables	β	α	M	SD
Core Service		.869		
x1 - Attention	0.83		4.33	1.43
x2 - Knowledgeable	0.82		4.20	1.30
x3 - Reliable	0.78		4.16	1.41
x4 - Well-maintained	0.76		4.22	1.30
Peripheral Service		.795		
x5 - Respond quickly	0.90		3.90	1.71
x6 – Enthusiastically	0.85		3.87	1.62
x7 - Polite	0.66		2.82	2.06
Perceived Value		.867		
x8 - Good service	0.82		4.32	1.32
x9 - Reasonably	0.80		4.31	1.33
x10 - High value	0.78		4.33	1.39
x11 - Economical	0.66		4.33	1.30
Consumer Satisfaction		.924		
x12 - Right thing	0.82		4.27	1.24
x13 - Satisfied decision	0.81		4.41	1.24
x14 - Happy	0.78		4.37	1.25
Behavioral Intentions		.948		
y1 - Recommend	0.85		4.80	1.30
y2 - Same choice	0.82		4.73	1.35
y3 - Use again	0.81		4.66	1.35

Scale Reliability

Cronbach's alpha of items ranged from .795 to .948, including core service ($\alpha = .869$), perceived value ($\alpha = .867$), behavioral intentions ($\alpha = .948$), consumer satisfaction ($\alpha = .924$), and peripheral service ($\alpha = .795$) (see Table 1). All estimates exceeded the .70 cutoff for good internal consistency reliability (Nunnally & Berstein, 1994).

Structural Equation Model

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 served as exogenous variables (independent variables), and perceived value, consumer satisfaction, and behavioral intentions served as endogenous variables (dependent variables).

Measurement model. The measurement model including 17 items and five latent variables was examined using AMOS 18 (see Figure 1). 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 values of NFI and CFI above .90 (Kline, 1998) and RMSEA of .08 or less (Browne & Cudeck, 1993) were considered adequate, the measurement of the latent constructs was adequate in this study.

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 ($x_5 = .924$ and $y_3 = .958$), indicating that more than 90% of the variance in the indicators was accounted for by given latent variables. The multiple R^2 of three other indicators, however, were relatively low ($x_7 = .243$, $x_{11} = .425$ and $x_4 = .449$), indicating that less than 45% of the variance in the indicators was explained by given latent variables.

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. 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, 2005) and RMSEA of .08 or less (Browne & Cudeck, 1993) were considered adequate, the measurement model to the data was acceptable (Figure 1).



Figure 1. Measurement Model of Consumer Behaviors in Virtual Golf

This analysis (see Table 2 and Figure 2) found direct and indirect effects among variables. As anticipated, consumer satisfaction had the largest direct effect ($\beta = .692$) on behavior intentions, indicating that consumers in virtual golf who were more satisfied had stronger behavioral intentions. Perceived value also had a significant direct effect ($\beta = .491$) on consumer satisfaction. Core service had a significant direct effect ($\beta = .268$) as well as a significant indirect effect ($\beta = .192$) on consumer satisfaction, suggesting that core service was not only directly related to consumer satisfaction but also indirectly related to consumer satisfaction via perceived value ($\beta = .390$). Conversely, peripheral service had neither significant direct ($\beta = .015$) nor indirect ($\beta = .010$) effects on consumer satisfaction, indicating that peripheral service was not related to consumer satisfaction directly and indirectly via perceived value ($\beta = .020$). In short, all variables except peripheral service had significant direct or indirect effects on given variables.

Table 2. Standardized and Unstandardized Parameter Estimates, Direct, Indirect, and Total Effects among Variables

IV	DV	Estimates	Direct Effect	Indirect Effect	Total Effect
Core	Value	.379 (.390)***	.390	.000	.390
	Satisfaction	.343 (.268)***	.268	.192	.460
Peripheral	Value	.017 (.020)	.020	.000	.020
	Satisfaction	.016 (.015)	.015	.010	.025
Value	Satisfaction	.648 (.491)***	.491	.000	.491
Satisfaction	Intentions	.746 (.692)***	.692	.000	.692

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

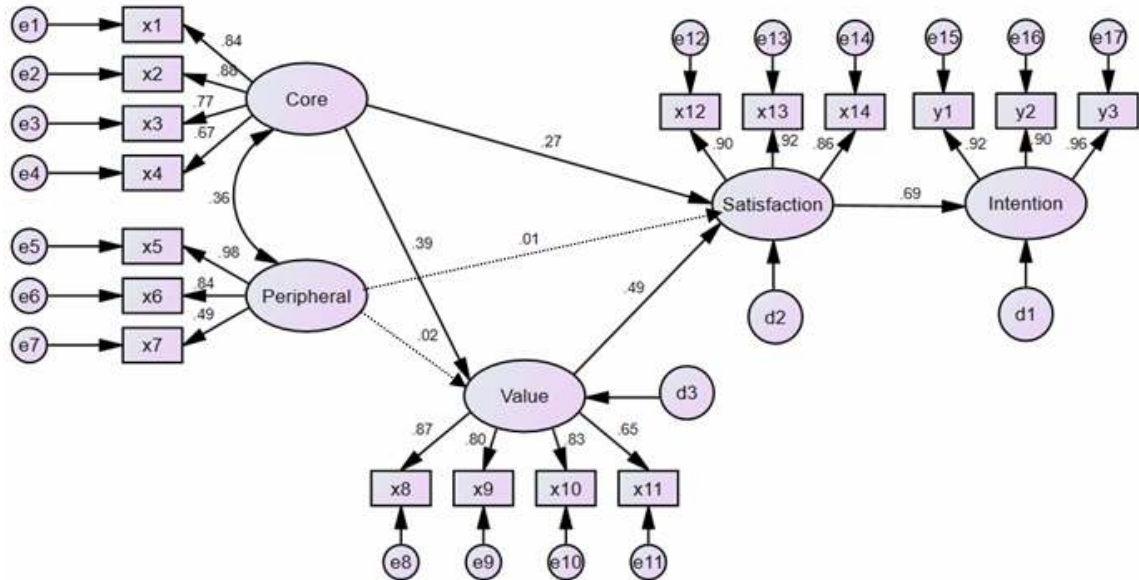


Figure 2. Structural Model of Consumer Behaviors in Virtual Golf

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

Discussion

The current study investigated the 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. Since the significant factors examined in this study were interrelated and had a great influence on each other (Yu et al., 2014), identifying the role and influence of each factor in a consumer's decision-making process is a great opportunity in a sport-related service industry. As a new sport genre using virtual reality with enormous potential, enhancing and developing the fan base through an investigation of consumer behaviors is more important than anything else. Based on findings regarding the relations among significant factors in consumer behaviors of virtual golf, this study provides practical and theoretical implications.

Theoretical and Practical Implications

According to previous literature, 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). Results of the current study exploring consumer behaviors in virtual golf mostly supported previous studies except the role of peripheral service among factors. In other words, peripheral service did not have any influences on perceived value, consumer satisfaction, and behavioral intentions in virtual golf. The notable 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. Although a study (Yosuke, Bennett, & James, 2007) also found that secondary services might not be a considerable influence on consumer behavior, since an individual consumption propensity varies depending on the nature of sports (Ko & Pastore, 2004), the results of this study should be interpreted within the nature of virtual golf.

From a practical marketing perspective, considering that the influence of peripheral service was modest at best in virtual golf facilities in this study, it is necessary for virtual golf service providers to mainly focus on core service, which plays the most important role in developing favorable consumer satisfaction and behavioral intentions with perceived value. That is, the virtual golf industry must provide continuous technical improvement

and maintain high standards of service quality through qualified service personnel. Virtual reality, which is more realistic than reality (Lee et al., 2013), is the strongest asset in the virtual sport industry. Along with consumers' rising expectations on advanced technology, it should be recommended for practitioners not to overlook that the success of the virtual golf industry depends on technological innovations. Furthermore, as mentioned earlier, since virtual golf is service business and service personnel is a person who might meet consumers on the front line, employee training could be another way to improve core service in virtual golf. On the other hand, even though the role of peripheral services was not significant in this study, the importance of peripheral service should not be overlooked. That is, the secondary services, which might not be closely related to playing virtual golf, will nevertheless be a marketing opportunity to develop the consumer experience. Since the kinds of services that might be provided in a virtual golf center are very limited, efforts to find a way to increase the quality and identify roles for peripheral service are required.

The second significant structural relationship in the study involved perceived value. The result 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 had only an indirect effect on consumer satisfaction via the mediating role of perceived value. This finding indicated the important role of perceived value (affordability) 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. Perceived value is determined by the differences between costs and benefits (Yu et al., 2014). That is, as a mediator, perceived value plays a great role in building favorable consumer satisfaction. In the same vein, considering that virtual golf offers relatively reasonable pricing, compared to outdoor golf in the Republic of Korea, the affordability of virtual golf might be its strongest weapon in attracting consumers and having differentiation from outdoor golf. 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 marketing strategy of virtual golf, which was invented so that consumers could enjoy golf without financial burden (Choe, 2008), might therefore align closely with consumer behaviors.

The last meaningful relationship was a path between consumer satisfaction and behavioral intentions. Consistent with the findings in previous literature (Churchill & Surprenant, 1982; Murray & Howat, 2002; Howat et al., 1999; McDougall & Levesque, 2000), the current study found that the strongest direct effect of consumer satisfaction was its influence on behavioral intentions when compared with other factors in virtual golf. Given that the ultimate marketing goal of virtual golf is to expand its fan base, the result showed what is important as an emerging sport. Furthermore, based on the statement that "loyal customers are not necessarily satisfied customers but satisfied customers tend to be loyal customers" (Fornell, 1992, p.7), the virtual golf industry should remember the value of satisfaction from a marketing perspective. 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 could play a vital role in choosing to participate in virtual golf.

Conclusions and Directions for Future Research

This study was the first step to explore a newly emerging sport with virtual reality, showing that there are differences and similarities from previous research from a marketing perspective. Given that the virtual golf is also one of the sport-related entrainment business, understanding consumer behaviors and predicting their consumption patterns, which might be a fundamental effort in sport marketing, should be mandatory. To attract potential consumers and retain current consumers, it is necessary to understand significant factors (i.e., core service, peripheral service, perceived value, consumer satisfaction, behavioral intentions) in individuals' decision-making process of virtual golf as this study found.

Additionally, 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 an opportunity to investigate the effect of virtual reality in detail from consumers' perspectives. The newly developed instruments would be standards for future research in virtual sport. Furthermore, 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.

References

- Alexandris, K., Zahariadis, P., Tsorbatzoudis, C., & Grouios, G. (2004a). An empirical investigation into the role of the outcome dimension in measuring perceived service quality in a health club context. *International Journal of Sport Management*, 5(3), 281-294.
- Alexandris, K., Zahariadis, P., Tsorbatzoudis, C., & Grouios, G. (2004b). An empirical investigation of the relationships among service quality, customer satisfaction and psychological commitment in a health club context. *European Sport Management Quarterly*, 4(1), 36-52.
- Backman, S., & Crompton, J. (1989). Discriminating between continuers and discontinuers of two public leisure services. *Journal of Park & Recreation Administration*, 7(4), 56-71

- Bitner, M. J., & Hubbert, A.R. (1994). Encounter satisfaction versus overall satisfaction versus quality: The customer's voice. In Rust, R.T., & Oliver, R.L. (Eds.). *Service quality: New directions in theory and practice* (pp. 72-94). Thousand Oaks, CA: Sage Publications.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.). *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage Publications.
- Byon, K., Zhang, J. J., & Baker, T. A. (2013). Impact of core and peripheral service quality on consumption behavior of professional team sport spectators as mediated by perceived value. *European Sport Management Quarterly*, 13(2), 232-263.
- Carlson, J., & O'Cass, A. (2010). Exploring the relationships between e-service quality, satisfaction, attitudes and behaviours in content-driven e-service web sites. *Journal of Services Marketing*, 24, 112-127.
- Choe, S. (2008, June 10). Where the growth of lush fairways has no bounds. *The New York Times*. Retrieved from <http://www.nytimes.com/2008/06/10/world/asia/10golf.html?pagewanted=all>
- Choi, Y. S., Seo, M., Scott, D., & Martin, J. (2010). Validation of the organizational culture assessment instrument: An application of the Korean version. *Journal of Sport Management*, 24(2), 169-189.
- Churchill Jr., G. A., & Surprenant, C. (1982). An investigation into the determinants of customer satisfaction. *Journal of Marketing Research*, 19(4), 491-504.
- Craig, C. (2013). Understanding perception and action in sport: How can virtual reality technology help?. *Sport Technology*, 6(4), 161-169.
- Cronin Jr., J. J., Brady, M. K., & Hult, G. M. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing*, 76(2), 193-218.
- Du, J., Jordan, J. S., & Funk, D. C. (2015). Managing Mass Sport Participation: Adding a Personal Performance Perspective to Remodel Antecedents and Consequences of Participant Sport Event Satisfaction. *Journal of Sport Management*, 29(6), 688-704.
- Dillman, D. A. (2007). *Mail and Internet surveys: The tailored design method* (2nd ed.). Hoboken, NJ: John Wiley & Sons, Inc.
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2008). *Internet, mail, and mixed-mode surveys: the tailored design method* (3rd ed.). Hoboken, NJ: John Wiley & Sons, Inc.
- Field, A. (2009). *Discovering statistics using SPSS*. (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Fornell, C. (1992). A national customer satisfaction barometer: The Swedish experience. *Journal of Marketing*, 56(1), 6-21.
- Garvin, N. (2016). Millennials are ditching golf because it's too hard and boring. *New York Post*. <http://nypost.com/2016/08/06/millennials-are-ditching-golf-because-its-too-hard-and-boring/>
- Han, W. (2004). *Leisure participation and constraints: The case of Korean Americans*. Ph. D. dissertation. The Pennsylvania State University. (Publication No. AAT 3147618).
- Han, H., Baek, H., Lee, K., & Huh, B. (2014). Perceived benefits, attitude, image, desire, and intention in virtual golf leisure. *Journal of Hospitality Marketing & Management*, 23(5), 465-486. doi:10.1080/19368623.2013.813888
- Howat, G., Crilley, G., Milne, I., & Absher, J. (1993). The basis for measuring quality customer service in sports & leisure centres. *Leisure Options*, 3(3), 5-13.
- Howat, G., Murray, D., & Crilley, G. (1999). The relationships between service problems and perceptions of service quality, satisfaction, and behavioral intentions of Australian public sports and leisure center customers. *Journal of Park & Recreation Administration*, 17(2), 42-64.
- Jun, J., & Kyle, G. T. (2011a). The effect of identity conflict/facilitation on the experience of constraints to leisure and constraint negotiation. *Journal of Leisure Research*, 43(2), 176-204.
- Jun, J., & Kyle, G. T. (2011b). Understanding the role of identity in the constraint negotiation process. *Leisure Sciences*, 33(4), 309-331.
- Jung, J., Park, H., Kang, H., Lee, S., & Hahn, M., (2010). Measurement of initial motion of a flying golf ball with multi-exposure images for screen-golf. *IEEE Transactions on Consumer Electronics*, 56(2), 516-523.
- Kaplanidou, K. (., Jordan, J. S., Funk, D., & Rindinger, L. L. (2012). Recurring Sport Events and Destination Image Perceptions: Impact on Active Sport Tourist Behavioral Intentions and Place Attachment. *Journal of Sport Management*, 26(3), 237-248.
- Kim, T., Seo, H., Kim, M. C., & Chang, K. (2014). Customer productivity in technology-based self-service of virtual golf simulators. *International Journal of Sports Marketing & Sponsorship*, 16(1), 24-39.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: Guilford Press.
- Ko, Y. J., & Pastore, D. L. (2004). Current issues and conceptualizations of service quality in the recreation sport industry. *Sport Marketing Quarterly*, 13(3), 158-166.
- Ko, Y. J., & Pastore, D. L. (2007). An instrument to assess customer perceptions of service quality and satisfaction in campus recreation programs. *Recreational Sports Journal*, 31, 34-42.

- Ko, Y. J., & Ross, S. D. (2006). An exploring of motives in sport video gaming. *International Journal of Sports Marketing & Sponsorship*, 8(1), 34-46.
- Kyle, G. T., Theodorakis, N. D., Karageorgiou, A., & Lafazani, M. (2010). The effect of service quality on customer loyalty within the context of ski resorts. *Journal of Park & Recreation Administration*, 28(1), 1-15.
- Lee, H., Chung, S., & Lee, W. (2013). Presence in virtual golf simulators: The effects of presence on perceived enjoyment, perceived value, and behavioral intention. *New Media & Society*, 15(6), 930-946. doi:10.1177/1461444812464033
- Lee, J. (2010). The population of virtual golf consumers has outnumbered that of actual golf consumers. Retrieved from http://blog.joins.com/media/folderlists/uid=taiji04&folder=2&list_id=11329804
- Lee, J. S., & Kang, J. (2015). Effects of sport event satisfaction on team identification and revisit intent. *Sport Marketing Quarterly*, 24(4), 225-234.
- McDougall, G. H., & Levesque, T. (2000). Customer satisfaction with services: Putting perceived value into the equation. *Journal of Services Marketing*, 14(5), 392-410.
- Miles, H. C., Pop, S. R., Watt, S. J., Lawrence, G. P., & John, N. W. (2012). A review of virtual environments for training in ball sports. *Computers & Graphics*, 36, 714-726.
- Murray, D., & Howat, G. (2002). The relationships among service quality, value, satisfaction, and future intentions of customers at an Australian sports and leisure centre. *Sport Management Review*, 5(1), 25-43.
- National Golf Foundation. (2015). *2015 Golf Participation in the U.S.* Retrieved from <http://ngfdashboard.clubnewsmaker.org/Newsletter/1111udoge19?a=5&p=2389923&t=410871>
- Noe, W. R. (2012). The world's first simulation golf tournament. Retrieved from <http://news.hankooki.com/lpage/sports/201207/h20120704202556111960.htm>
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Petrick, J. F., Backman, S. J., & Bixler, R. D. (1999). An investigation of selected factors' impact on golfer satisfaction and perceived value. *Journal of Park & Recreation Administration*, 17(1), 40-59.
- Powell, M. (2014). Sneakernomics: How golf lost the millennials. *Forbes*. Retrieved from <https://www.forbes.com/sites/mattpowell/2014/07/24/sneakernomics-how-golf-lost-the-millennials/#18a257153b4b>
- Shukla, P. (2010). Effects of perceived sacrifice, quality, value, and satisfaction on behavioral intentions in the service environment. *Services Marketing Quarterly*, 31(4), 466-484. doi:10.1080/15332969.2010.510730
- Sousa, V. D., & Rojjanasirirat, W. (2011). Translation, adaptation and validation of instruments or scales for use in cross-cultural health care research: A clear and user-friendly guideline. *Journal of Evaluation In Clinical Practice*, 17(2), 268-274. doi:10.1111/j.1365-2753.2010.01434
- Stevens, J. P. (2009). *Applied multivariate statistics for the social sciences* (5th ed.). New York, NY: Routledge/Taylor & Francis Group.
- The Korea Golf Association (2014). *Korea golf index*. Retrieved from <http://www.kgagolf.or.kr>
- The Korea Leisure Research Center (2016). *Leisure industry yearbook 2016*. ISBN: 9771598324205
- Theodorakis, N., Alexandris, K., Rodriguez, P., & Sarmiento, P. J. (2004). Measuring customer satisfaction in the context of health clubs in Portugal. *International Sports Journal*, 8, 44-53.
- Yiannakis, A. (1989). Toward an applied sociology of sport: The next generation. *Sociology of Sport Journal*, 6(1), 1-16.
- Yoshida, M., & James, J. D. (2010). Customer satisfaction with game and service experiences: Antecedents and consequences. *Journal of Sport Management*, 24, 338-361.
- Yosuke, T., Bennett, G., & James, Z. (2007). Consumer satisfaction with an action sports event. *Sport Marketing Quarterly*, 16(4), 199-208.
- Young, I. S., & Pedersen, P. M. (2010). Participants' service quality perceptions of fantasy sports websites: The relationship between service quality, customer satisfaction, attitude, and actual usage. *Sport Marketing Quarterly*, 19(2), 78-87.
- Yu, H. S., Zhang, J. J., Kim, D. H., Chen, K. K., Henderson, C., Min, S. D., & Huang, H. (2014). Service quality, perceived value, customer satisfaction, and behavioral intention among fitness center members aged 60 years and over. *Social Behavior and Personality*, 42(5), 757-768. doi:10.2224/sbp.2014.42.5.757
- Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence. *Journal of Marketing*, 52(3), 2-22.
- Zhang, M. L. (2007). *An analysis of recreational golfer motivation, constraints, and satisfaction on the mastery and frequency of play in the Gulf Coast region of Mississippi*. Ph.D. dissertation. United States Sports Academy (Publication No. AAT 3285712).