

Understanding Consumer Behaviors in Virtual Golf: Differences in Leisure Constraints

Chulhwan Choi, University of Louisville

T. Christopher Greenwell, University of Louisville

Mary A. Hums, University of Louisville

Marion E. Hambrick, University of Louisville

Abstract

Screen golf, a virtual sport utilizing interactive simulators, has seen enormous growth in the Republic of Korea. This virtual sport removes some of the constraints consumers experience keeping them away from playing golf at an outdoor course (e.g., cost and weather). This study explored how leisure constraints differ between screen golf and outdoor golf and identified differences in leisure constraints among diverse types of consumers. Based on a sample of 389 South Korean consumers, results indicated significant differences in leisure constraints between outdoor and virtual golf in cost, weather, time, and skill/confidence. In addition, constraints differed according to respondents' personal golf experience, household income, and mastery level.

Keywords: golf, virtual sport, leisure constraints, demographics

Golf is one of the most popular sports in the Republic of Korea (Kim, 2014). The Korea Golf Association (2014) reported the golf population has increased by 12% every year, and 39% of survey participants said they would like to learn how to play golf—suggesting a potential golf population of over 13 million people within the Republic of Korea. This phenomenon contrasts with the global golf population, which has declined since the late 1990s (Mullin, Hardy, & Sutton, 2014).

One reason golf participation has increased in the Republic of Korea is closely related to a change in how consumers enjoy golf. Virtual golf, also known as indoor screen golf, has played a significant role

in eliminating some of the barriers of playing golf by offering a new playing format and reasonable prices. Virtual golf utilizing interactive simulators allows participants to use actual golf clubs and balls in front of a projection screen, freeing golfers from restrictions in terms of time, weather, and location by recreating global golf courses through downloaded aerial images (Kim, Seo, Kim, & Chang, 2014). Furthermore, considering that a golf club membership costs approximately \$100,000 to \$500,000 and a daily green fee costs approximately \$200 (The Korea Golf Association, 2014), this new type of golf has become an economical option affecting the number of outdoor golf participants (Han, Baek, Lee, & Huh, 2014). Numbers also indicate virtual golf has become one of the more popular sport-related businesses in the Republic of Korea, as it meets the interests of golfers who may experience difficulties in accessing actual outdoor golfing opportunities. It has accomplished this feat by eliminating many limitations such as location, time, and weather faced by outdoor golf participants (Han, 2004; Petrick, Backman, Bixler, & Norman, 2001; Zhang, 2007). Virtual golf, however, often fails to attract golfers who enjoy playing the sport outdoors.

While there is a substantial amount of literature examining constraints to leisure participation, an examination of virtual golf, a sport created to overcome many of the barriers to golf participation, presents an opportunity to gain unique insights into both leisure constraints and virtual sport. Specifically, this study extends prior work by illustrating how these constraints may differ between traditional outdoor golf and virtual golf. Similarly, this study examines how these constraints may differ among consumers who are experienced in only outdoor golf, only virtual golf, or experienced in neither (potential consumers). This examination should provide insight into how virtual golf helps overcome various constraints and identify any constraints to participation still needing to be addressed. Additionally, an examination of how these constraints vary among different consumer groups may help identify which groups may be more disadvantaged by various constraints. Therefore, the purpose of this study is to investigate differences in constraints between outdoor and virtual golf and explore how constraints to participating in virtual golf may differ among different consumer groups. Given declining participation in golf overall, this study should also provide insight into how to better market both outdoor and virtual versions of the sport. Results from this study should provide a significant opportunity to develop the overall golf industry, not only in the Republic of Korea, but in other countries as well.

Virtual Sport

Emerging sports applying diverse types of technology have significantly increased in popularity (Ko, Park, & Claussen, 2008; Lee, Cheon, Judge, Shin, & Kim, 2012). 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 & Pedersen, 2010), such as sport-related video/online games, eSports, or fantasy sports.

Virtual sport refers to sport using computer interfaces to allow customers to gain experience activities similar to what they would experience in the real world (Jeng, Pai, & Yeh, 2017). These activities have been found to improve player mechanics (Cotterill, Sanders, & Collins, 2010), anticipatory judgments (Craig, Berton, Rao, Fernandes, & Bootsma, 2006), and overall performance (Sommer & Rönqvist, 2009). Virtual golf has evolved from what was once a training activity to a recreational pursuit, and an emerging stream of research addresses how people consume the sport. Lee, Chung, and Lee (2013) found enjoyment and perceived value predicted behavioral intentions. They also contended that the socialization aspect may be more important than the technological aspects. Han, Hwang, and Woods (2014) found as golfers become more confident in their ability and perceived fewer obstacles, their intentions to play increases. Their findings also indicated that benefits of virtual golf such as reduced expense, less time required to play, and ease of access motivated higher levels of participation. However, these benefits may have adverse impacts on the sport as Han and Hwang (2014) argued these benefits could be a threat to traditional outdoor golf. While the aforementioned research has identified various constraints to playing virtual golf, less is known about how these constraints differ between traditional outdoor golf and virtual golf.

Leisure Constraints

Researchers have examined leisure constraints to understand diverse factors in an individual's daily life that might influence leisure participation (Samdahl & Jekubovich, 1997), analyze rapidly changing individuals' leisure preferences (Jackson, 1990a), and explain variations in leisure choices for a wide range of the population (Jackson, 1990b). Iso-Ahola (1981) developed a conceptual model to identify leisure constraint sources, and Iso-Ahola and Mannell (1985) expanded the model based on the importance of individual social and psychological constraints in understanding leisure participation. Crawford and Godbey (1987) proposed three types of constraints: (a) intrapersonal barriers (e.g., stress, depression, and anxiety), (b) interpersonal barriers (e.g., relationship with a spouse, children, or friends), and (c)

structural barriers (e.g., financial resources, lifestyle, season, climate, and work time). Based on the three barriers, Crawford and Godbey presented a model of relationships among preferences, constraints, and participation. They emphasized that the individual was entangled in diverse relationships with people (interpersonal barriers).

In addition, through additional modifications of the existing three types of constraints (i.e., interpersonal, intrapersonal, and structural barriers), Crawford, Jackson, and Godbey (1991) argued that a sequential hierarchy of four constraint levels influences leisure participation: (a) leisure participation results from the successful confrontation of each constraint level; (b) individuals cannot reach the next constraint level without successfully confronting a current constraint; (c) structural constraints (e.g., income and education) have a stronger impact on participation; and (d) leisure constraints may continue to influence subsequent commitment after participation.

Some researchers found perceptions of constraints did not necessarily prevent participation (Kay & Jackson, 1991) and participation might not depend upon the absence of constraints (Jackson, Crawford, & Godbey, 1993). However, diverse barriers, which might inhibit leisure participation, existed. The results of constraints research suggests an individual's leisure participation rate can be increased and various personal reasons for not wanting to participate can be overcome. Whereas previous research focused on leisure constraints causing individuals' nonparticipation, Crawford et al. (1991) suggested leisure constraints were not necessarily considered insurmountable limitations, but a negotiable concept. When facing a constraint, an individual might negotiate the constraint in various ways, which may lead to subsequent participation or nonparticipation in leisure activities (Scott, 1991). Leisure constraints have subsequently been discussed as negotiable factors in individuals' decision-making processes (Godbey, Crawford, & Shen, 2010; Hubbard & Mannell, 2001). In addition to negotiation, one more psychological 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. 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).

Leisure constraints have been applied as a theoretical framework to various segments of the sport industry such as spectatorship (Kim & Trail, 2010; Pritchard, Funk, & Alexandris, 2009; Trail, Robinson, & Kim, 2008), sport travel (Funk, Alexandris, & Ping, 2009; Kim & Chalip, 2004), and fantasy sport

participation (Suh, Lim, Kwak, & Pedersen, 2010). In terms of sport participation, Alexandis and Carroll (1997a, 1997b, 1999) were some of the first researchers to measure constraints to sport participation, identifying seven constraints to recreational sport participation. Through their studies of Greek consumers, they found time, facilities/services, and accessibility/financial constraints tended to be experienced the most. These constraints have been repeatedly found to affect consumers in a variety of contexts. For example, Ruseki, Humphreys, Hallman, and Breuer (2011) found time was a significant constraint for German sport participants; Hambrick, Simmons, and Mahoney (2013) found financial and time constraints impacted participation among triathletes; Spivey and Hritz (2013) found college students were most constrained by time; and Meyer and Surujlal (2014) found poorer consumers did not participate in recreation due to proximity to facilities, cost, and time.

Identifying characteristics of nonparticipants can be meaningful for both participants and practitioners (Crawford & Godbey, 1987; Jackson, 1988; Jackson & Dunn, 1988). A nonparticipant is defined as an individual who had a desire to participate in a leisure activity but is unable to do so because of the influences of one or more leisure constraints (Jackson, 1983). In recreational sport, nonparticipants or those who are physically inactive have been found to experience more constraints than participants (Alexandris & Carroll, 1999; Casper, Bocarro, Kanters, & Floyd, 2011; Liu, Chung, & Chen, 2014). Constraints also influence frequency of participation (Alexandris, Tsorbatzoudis, & Grouios, 2002). There is also a negative relationship between constraints and activity attachment (Alexandris, Funk, & Pritchard, 2011). Specifically, Alexandris, Du, Funk, and Theodorakis (2017) found constraints differed according to how connected they were to the activity, as consumers with lower connections with an activity are likely to be more vulnerable to various constraints. However, even those at the highest levels reported the existence of time and financial constraints. Commitment plays a role in consumers' ability to negotiate constraints (Lyu & Oh, 2014).

Researchers have explored leisure constraints of recreational golfers by constructing constraints items from in-depth interviews and previous studies using these items to investigate the effects of social factors on individuals' leisure participation. Social, financial, and time constraints have been found to be prominent predictors of golf participation (Jun & Kyle, 2011a; Jun & Kyle, 2011b; Petrick et al., 2001). Following a recommendation (Mannell & Iwasaki, 2005) regarding the importance of activity-specific

scales for specific leisure domains, the current study investigated the consumer behaviors of golfers in outdoor and virtual golf and employed the leisure constraints model of Jun and Kyle (2011a, 2011b).

Consumer Differences

Given demographic variables greatly impact consumer behaviors even under identical conditions, paying attention to consumer attributes may enable more effective exploration of these behaviors (Greenwell, Fink, & Pastore, 2002). Petrick, Backman, and Bixler (1999) argued that personal experience and evaluation regarding consumer behaviors may be quite distinct from individual to individual. Specifically, Petrick et al. (1999) found that household income may affect customer consumption experience, and noted that golfers with higher incomes tended to be less satisfied with their golf experiences due to higher expectations.

Furthermore, distinctive “golfographic” variables could also be considered significant (Zhang, 2007). Golfographics are defined as variables related directly to golfing such as mastery of the sport, years of play, golf membership, and frequency of playing (Hennessey, MacDonald, & Yun, 2010). Given golfers’ subjective perceptions of leisure participation may be determined by distinct personal characteristics (Trail & Kim, 2011), golfographic variables should not be overlooked. Mastery was an especially important determinant because skilled golfers were less likely to be satisfied with their playing experience due to higher expectations resulting from more frequent experiences on golf courses (Zhang, 2007).

Therefore, the purposes of this research were to (a) investigate differences in golfers’ leisure constraints between participation in outdoor golf and virtual golf, (b) explore differences in individuals’ leisure constraints in virtual golf based on their golf experience, and (c) examine effects of selected factors (household income and mastery) on constraints in virtual golf. Four research questions are presented.

RQ 1. What are the differences in leisure constraints between participation in outdoor golf and virtual golf?

RQ 2. What are the differences in leisure constraints in virtual golf based on golf experience (outdoor only, virtual only, both, neither)?

RQ 3. Which leisure constraints differ among household income levels in participating in virtual golf?

RQ 4. Which leisure constraints differ among mastery levels in participating in virtual golf?

Method

Participants and Data Collection

Because the Republic of Korea has become the leading country in virtual golf simulator systems (Han et al., 2014), the target population for this study was individuals with varying levels of experience with outdoor golf and virtual golf in the Republic of Korea. The data collection procedure was implemented for 60 days at five virtual golf centers in Seoul, two driving ranges in Seoul, and two outdoor golf country clubs (one private and one public course) in the suburbs of Seoul. A multi-purpose sports center with various facilities (e.g., a gym, swimming pool, indoor driving range, and restaurants) was selected as one of the two driving ranges. This approach enabled data collection from individuals with different golf experiences, including those with no experience in either outdoor or virtual golf. Respondents who had never played golf in either context were included because one of the research purposes was to explore leisure constraints of potential consumers.

All study participants responded to a question about their golf experience in outdoor and virtual golf (i.e., Which one of the following golf contexts have you experienced?). Their responses were used to divide respondents into one of four groups: (a) only played outdoor golf, (b) only played virtual golf, (c) both, and (d) neither. The entire sample ($n = 389$) was utilized to analyze RQ1, RQ2, and RQ3, which investigated the effects of golf context, experience, and household income on virtual golf participation. For RQ4, analyzing the influence of mastery in virtual golf, only experienced golfers ($n = 209$) in virtual golf were included in the analysis.

Scale Development

Twenty-four items covering seven subdimensions of leisure constraints developed by Jun and Kyle (2011a, 2011b) were utilized to investigate problems golfers experienced in playing golf. The seven constraints they identified were: social (not having people to play with), health (lacking the physical abilities to play), skill (difficulty of the sport), confidence (doubts about one's ability to play well), cost (the overall cost of participation), weather (weather conditions preventing play), and time (lacking the time to participate). While the weather subdimension did not relate to virtual golf (indoor sport), it was included in order to investigate differences between outdoor golf and virtual golf. Considering participation in outdoor golf might be limited by inclement weather conditions, the dimension could provide a research opportunity to examine whether virtual golf may eliminate a leisure constraint associated with outdoor golf. Given some of the cost items in Jun and Kyle's scale were specific to outdoor golf, an item related to cart fees was

deleted and references to “greens fees” were changed to “fees.” Items were measured on a seven-point response scale anchored with “strongly disagree” and “strongly agree.”

Statistical Analysis

To address Research Question 1 (*What are the differences in leisure constraints between participation in outdoor golf and virtual golf?*), the researchers performed six paired-samples *t*-tests to compare six leisure participation constraints (i.e., social, health, cost, weather, time, and skill/confidence). All survey respondents ($n = 389$) completed two sets of surveys composed of questions about two distinct types of golf environments (i.e., outdoor and virtual golf).

To address Research Question 2 (*What are the differences in leisure constraints in virtual golf based on golf experience?*), the researchers performed a four-group MANOVA to compare leisure constraints in virtual golf based on golf experience between respondents who had played only virtual golf, only outdoor golf, both, and neither.

To address Research Question 3 (*Which leisure constraints differ among household income levels in participating in virtual golf?*), the researchers performed a three-group MANOVA to examine whether household income had a significant relationship with constraints in virtual golf. This analysis applied six leisure constraints, and participants were divided into three groups (i.e., high, medium, and low) based on household income. All respondents were included in this analysis to understand the influence of financial resources on participation in virtual golf.

To address Research Question 4 (*Which leisure constraints differ among mastery levels in participating in virtual golf?*), the researchers conducted a four-group MANOVA to investigate whether mastery significantly influenced leisure constraints in virtual golf. Respondents who had no experience with virtual golf and had only played outdoor golf were excluded from 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), and the participants were divided into four groups based on the self-reported average scores in virtual golf (i.e., beginner, intermediate, advanced, and master), following the standard of Petrick et al. (1999).

Results

Descriptive Statistics

After receiving human subjects research approval from the author's Institutional Review Board (IRB), 550 surveys were distributed, and 412 surveys were returned. After excluding 23 incomplete surveys, the sample consisted of 300 (77.1%) males and 89 (22.9%) females for a 70.7% response rate. Respondents' ages ranged from 19 to 75 years old ($M = 40.03$, $SD = 12.86$). In terms of age, 59.1% ($n = 230$) of the sample was between the ages of 21 and 39 years old. Regarding marital status, 139 (35.5%) were single, 239 (61.4%) were married, and 12 (3.1%) were either divorced or widowed. Additionally, a majority of survey participants had a bachelor's degree ($n = 234$, 60.2%). Finally, approximately 63% of the sample reported household incomes over 50 million Korean won (approximately USD 43,000).

A majority of the participants reported playing outdoor golf less than once per month ($n = 145$, 37.3%) or virtual golf less than once per month ($n = 166$, 42.7%). In regard to average scores in outdoor golf, participants reporting "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, in terms of average scores in virtual golf, participants reporting "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%).

Validation of Construct Structure

Given the leisure constraint factors were utilized in a unique setting, an exploratory factor analysis (EFA) of the leisure constraint items was performed for each golf context. For the first EFA of leisure constraints in outdoor golf (24 items), the Kaiser Meyer-Olkin measure verified the sample adequacy for the analysis, $KMO = .838$, exceeding the .70 threshold criteria (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 .40 criteria (Stevens, 2009). 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). 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.

On the second EFA of leisure constraints in virtual golf (24 items), the Kaiser Meyer-Olkin measure verified the sample adequacy for the analysis, KMO = .870, exceeding the .70 criteria (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 .40 criteria (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). Similar to the factor structure of leisure constraints in outdoor golf, the combined factor was also named “skill/confidence.” The remaining items maintained their initial factor structures without changes.

Scale Reliability

In the outdoor golf context, alpha coefficients for the six leisure constraints ranged from .739 to .920, including social ($\alpha = .739$, AVE = .544), health ($\alpha = .755$, AVE = .655), skill/confidence ($\alpha = .920$, AVE = .592), cost ($\alpha = .888$, AVE = .695), weather ($\alpha = .795$, AVE = .651), and time ($\alpha = .803$, AVE = .585). In the virtual golf context, alpha coefficients for the six leisure constraints ranged from .732 to .936, including social ($\alpha = .732$, AVE = .565), health ($\alpha = .795$, AVE = .556), skill/confidence ($\alpha = .936$, AVE = .648), cost ($\alpha = .879$, AVE = .581), weather ($\alpha = .918$, AVE = .698), and time ($\alpha = .880$, AVE = .635). All Cronbach’s alpha estimates exceeded the .70 cutoff for good internal consistency reliability (Nunnally & Bernstein, 1994).

Research Questions

Research question 1. The set of paired t test found statistically significant mean differences for cost, $t(388) = 13.952$, $p < .001$, weather, $t(388) = 20.533$, $p < .001$, time, $t(388) = 14.046$, $p < .001$, and skill/confidence, $t(388) = 8.247$, $p < .001$. No statistically significant differences were found for social, $t(388) = .515$, $p = .607$, and health, $t(388) = -.382$, $p = .703$. Results indicated that the four constraints (cost, weather, time, and skill/confidence) were greater when participating in outdoor golf versus virtual golf.

Research question 2. The multivariate test indicated differences based on experience in virtual golf on the composite dependent variables [Wilks’ lambda = .719, $F(18, 1075) = 7.403$, $p < 0.001$, partial $\eta^2 = .104$]. Based on the adjusted alpha level using Bonferroni correction ($p = 0.05/6 = .008$), the univariate

ANOVAs for social, $F(3, 385) = 7.108, p < 0.001$, partial $\eta^2 = .052$, cost, $F(3, 385) = 11.112, p < 0.001$, partial $\eta^2 = 0.080$, weather, $F(3, 385) = 5.013, p = .002$, partial $\eta^2 = .038$, time $F(3, 385) = 17.052, p < 0.001$, partial $\eta^2 = .117$, and skill/confidence $F(3, 385) = 34.735, p < 0.001$, partial $\eta^2 = .213$, were statistically significant. However, the univariate ANOVA for health, $F(3, 385) = .657, p = 0.579$, partial $\eta^2 = .005$ was not statistically significant.

Tukey HSD post hoc analyses were implemented to examine the significant effect of golf experience on leisure constraints in virtual golf. For the social constraint, the both-experienced group ($M = 2.72, SD = 1.00$) indicated significantly lower scores than the only-outdoor group ($M = 3.26, SD = 1.42$) and the no-experience group ($M = 3.22, SD = 1.01$). For the cost constraint, the both-experienced group ($M = 2.77, SD = 1.27$) indicated significantly lower scores than the only-virtual group ($M = 3.66, SD = 1.29$) and the no-experience group ($M = 3.67, SD = 1.69$). For the weather constraint, the both-experienced group ($M = 2.58, SD = 1.45$) showed significantly lower scores than the no-experience group ($M = 3.28, SD = 2.16$). For the time constraint, the both-experienced group ($M = 2.80, SD = 1.42$) showed significantly lower scores than the only-outdoor group ($M = 3.50, SD = 1.14$) and no-experience group ($M = 4.00, SD = 1.54$). For the skill/confidence constraint, the both-experienced group ($M = 2.70, SD = 1.26$) indicated significantly lower scores than the rest of groups: the only-outdoor group ($M = 3.82, SD = 1.36$), the only-virtual group ($M = 3.68, SD = 1.17$), and the no-experience group ($M = 4.36, SD = 1.61$).

Research question 3. Subjects were divided into three groups based on their self-reported income. The low group ($n = 142$) included subjects reporting annual income less than KRW 49,999,999, the medium group ($n = 107$) included subjects reporting annual income from KRW 50,000,000 to KRW 74,999,999, and the high group ($n = 140$) included subjects reporting KRW 75,000,000 or higher. The multivariate test showed significant differences in perceived constraints among the three household income groups [Wilks' lambda = .839, $F(6, 381) = 5.806, p < 0.001$, partial $\eta^2 = .084$]. Based on the 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, $F(2, 386) = 5.256, p = 0.006$, partial $\eta^2 = .027$, and (d) skill/confidence, $F(2, 386) = 7.024, p < 0.001$, partial $\eta^2 = .035$, were statistically significant. However, the rest of the univariate ANOVAs were not statistically significant: (a) health, $F(2, 386) = .209, p = 0.812$, partial $\eta^2 = .001$, and (d) weather, $F(2, 386) = .932, p > 0.395$, partial $\eta^2 = .005$.

Tukey HSD post hoc analyses were performed to examine the significant effect of household income on leisure constraints in virtual golf. For the social constraint, the low-income group ($M = 3.21$, $SD = 1.12$) indicated significantly 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 ($M = 3.20$, $SD = 1.57$).

Research question 4. Subjects were divided into four groups based on their self-reported skill. The beginner group ($n = 50$) included subjects reporting average scores of 100 or greater, the intermediate group ($n = 49$) included subjects reporting average scores from 91-99, the advanced group ($n = 63$) included subjects reporting average scores from 82-90, and the master group ($n = 38$) included subjects reporting average scores of 81 or less. The multivariate test showed significant differences in constraints among the four mastery groups [Wilks' lambda = .839, $F(6, 365) = 2.011$, $p < 0.001$, partial $\eta^2 = .057$]. Based on the 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 $\eta^2 = .009$.

Tukey HSD post hoc analyses were conducted to examine the significant effect of mastery on leisure constraints in virtual golf. For the cost constraint, the beginner group ($M = 1.44$, $SD = 1.41$) indicated significantly 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 ($M = 2.63$, $SD = 1.35$).

Table 1. Mean Differences in Leisure Constraints Among Consumer Groups.

	Social	Health	Cost	Weather	Time	Skill
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Context						
Outdoor	3.05 (1.42)	2.56 (1.38)	4.20 (1.59)	4.93 (1.42)	4.48 (1.45)	3.91 (1.53)
Virtual	3.01 (1.12)	2.59 (1.43)	3.22 (1.45)	2.84 (1.75)	3.34 (1.49)	3.48 (1.54)
Experience						
Only outdoor	3.26 (1.42)	2.48 (1.43)	3.31 (1.22)	2.54 (1.52)	3.50 (1.14)	3.82 (1.36)
Only virtual	3.21 (0.99)	2.73 (1.55)	3.66 (1.29)	3.22 (1.73)	3.54 (1.38)	3.68 (1.17)
Both	2.72 (1.00)	2.51 (1.24)	2.77 (1.27)	2.58 (1.45)	2.80 (1.42)	2.70 (1.26)
None	3.22 (1.01)	2.71 (1.65)	3.67 (1.69)	3.28 (2.16)	4.00 (1.54)	4.36 (1.61)
Income						
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)
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 (1.44)	2.87 (1.68)	3.23 (1.52)	3.46 (1.36)

Note: The bolds show significant mean differences on given variables.

Discussion

Advanced technology has not only brought about dramatic changes in consumption patterns but also has generated new types of sports. The current research began from the idea that advanced technology can change not only an existing sport, but also an individual's behavior in relationship to that sport.

Therefore, this study's purpose was to examine how an existing sport, offered through a virtual format, may affect consumer behaviors. Previous literature has emphasized the role of individuals' psychological and social factors (Crawford & Godbey, 1987; Hubbard & Mannell, 2001; Iso-Ahola & Mannell, 1985; Jun

& Kyle, 2011a). That is, existing literature focused on interpersonal (e.g., relationship with family or friends) and intrapersonal factors (e.g., stress or depression) in leisure studies. However, this study found that the factors of cost and time were relatively more important than the others (social, health, and skill/confidence) and highlighted that structural constraints (e.g., financial resources, weather, or time) might play a larger role than the other two types of constraints (interpersonal and intrapersonal). These findings support the notion that constraints differ between different sport forms. Although outdoor and virtual golf are based on the same sport, they are different versions of the sport using different platforms resulting in different consumer experiences.

Comparing Outdoor Golf to Virtual Golf

As expected, higher levels of constraints for playing outdoor golf existed for cost, weather, time, and skill/confidence. Weather showed the largest mean difference, suggesting the indoor sport (virtual golf) eliminated the weather constraint for the outdoor sport (outdoor golf). This result confirmed the most attractive characteristic of virtual golf - controlling for inclement weather.

The second largest mean difference was found in the cost constraints, suggesting virtual golf presented less financial burden than outdoor golf. In terms of price differences between outdoor and virtual golf, the Korea Golf Association (2014) reported average fees of approximately USD 200 for outdoor golf and approximately USD 20 for virtual golf. Considering virtual golf was initially invented so people could enjoy golf with minimal financial concerns (Choe, 2008), the result of this analysis was notable in recognizing virtual golf reduces financial demands for golfers.

The third largest mean difference was found in the time constraints, suggesting virtual golf presented fewer time burdens than outdoor golf. Despite the fact that a round of virtual golf still takes several hours, people may perceive this duration of play as a relatively short amount of time in comparison to outdoor golf. Virtual golf centers may be located closer to where the golfer lives. Hence, decreased transportation time to and from the virtual golf facility represents another important factor.

Lastly, despite relatively smaller mean differences, individuals perceived they might need higher levels of skill/confidence when participating in outdoor golf compared to virtual golf. Given virtual golf was created for beginners, this finding is understandable. The implication here is that virtual golf operators may capitalize on these perceptions to attract new consumers to the sport. Further, these perceived differences may explain some of the reasons consumers choose virtual over outdoor games.

Participant Experience

This study supported the importance of experience in individuals' leisure participation in that individuals with more diverse experiences (i.e., individuals experienced in both outdoor and virtual golf) were less constrained by the specific factors (i.e., social, cost, weather, time, and skill/confidence). That is, participants with different golf experience levels perceived participation constraints differently in this study. Previous literature also argued for the significance of experience in leisure constraints on several factors (e.g., cost, social, and skill) (Jackson & Dunn, 1991). Given that the existence of experience might be closely related to psychological effects on consumer behaviors, empirical evidence from existing literature (LaForge-Mackenzie & Sullivan, 2014) indicated that self-efficacy (confidence) had a positive influence in participating in a certain sport. That is, individuals with higher confidence were more likely to participate in the sport. Considering more experience might result in higher confidence, which would facilitate leisure participation, experience should be considered a significant factor.

Similarly, the largest mean difference in this study was found in skill/confidence between participants experienced in both outdoor and virtual golf and participants with other experiences (e.g., only outdoor golf, only virtual golf, and neither). In other words, the results might indicate that more golf experience, regardless of the type, facilitates participation in virtual golf and lessens golfers' psychological burdens regarding their confidence. Furthermore, considering the fact golf has been considered an elite sport, which might be hard to learn (Garvin, 2016), the results are more understandable. Another plausible reason could be that individuals who have experiences in both outdoor and virtual golf should invest more pecuniary, physical, and mental efforts than others to the sport "golf" itself, and the efforts and interests in golf might result in the lower mean scores in all significant constraints.

Household Income and Mastery

The disparity of perceived constraints between participants was found again in analyses using demographic (household income) and golfographic (mastery) information, supporting existing literature finding an individual's consumer behavior might vary based on personal attributes (Chick, Hsu, Yeh, & Hsieh, 2015; Cho & Price, 2016; Hudson, Walker, Simpson, & Hinch, 2013; Lyu & Lee, 2016; Petrick et al., 1999).

Household income. The result of this study was consistent with previous studies finding individuals with lower household incomes were more likely to participate in leisure activities (Scott &

Munson, 1994; Searle & Jackson; 1985; Shores, Scott, & Floyd, 2007). Given the argument that virtual golf was invented to reduce financial barriers keeping individuals from playing golf (Choe, 2008), the third research question sought to understand how participants' household income level influenced participation in virtual golf. There were significant differences in social, time, and skill/confidence constraints in addition to the cost constraints, as customers with low household income experienced higher levels of constraints than those with higher household incomes. This analysis indicated many virtual golf consumers still experience financial burdens even if the cost of playing virtual golf was less expensive than playing outdoor golf (The Korea Golf Association, 2014). In other words, regardless of the comparison to outdoor golf, participants may still perceive the cost of playing virtual golf as a financial burden. Even though virtual golf is marketed as being more affordable with the hope more people would participate, income can still be a deterrent to participation.

Skill level. Individuals with a higher level of performance (mastery) were less likely to limit their leisure participation, supporting existing research (Beattie, Fakehy, & Woodman, 2014). Regardless of the empirical evidence from previous research, it may be generally understandable that the higher performance might result from more participation in leisure activities. Since virtual golf was developed for beginners (Choe, 2008), it is important to explore the relationship of virtual golf skill level to participation constraints. Results revealed significant differences, as beginners felt more constrained due to cost and skill/confidence than the advanced group. Even though virtual golf is a recreational sport, this result showed that virtual golf customers seemed to emphasize the concepts of skill and confidence as well as concept of recreation. This result might be because virtual golf is also a sport involving competition with friends and family. As anticipated, skill/confidence was the highest reported mean score among all factors for the beginners group as the most significant psychological burden in virtual golf. Knowing consumers with lower skill levels might be the most significant target population to expand the virtual golf participant base, virtual golf industry facility operators could offer easier game formats for lower mastery groups and could emphasize recreational aspects by adding more diverse services in virtual golf facilities.

Practical Implications

Since virtual golf is an emerging sport still seeking to expand its participant base, consumer segmentation based on personal characteristics is essential in investigating consumer behaviors. Investigations examining homogenous consumer groups sharing similar perspectives are a way to better understand

consumption (Jun, Kyle, & Mowen, 2009). In the same vein, this study provides a better understanding of what prevents the following groups from participating more: (a) customers with low household income or with a low level of skill in virtual golf and (b) potential customers who have never experienced virtual golf.

Despite being 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 no higher than the other groups, with those two groups reporting they perceived the most limitations to participating in virtual golf. That is, the marketing strategy of virtual golf did not seem to align with reality and consumer expectations. From a slightly different marketing perspective, however, the low-income or low-skill group might potentially be the most important consumer groups. Thus, service providers could consider using more diverse playing formats and payment options to attract various consumer classes. For example, service providers could develop existing playing formats for the low-skill group who might want to practice and to play virtual golf at the same time. Through the virtual golf simulation system, customers might obtain unique data regarding their performances and improve golf skills based on the objective information. Additionally, unlike existing format such as 9 or 18-hole play of actual outdoor golf, virtual golf could use new payment options based on time played rather than holes played. This new format could reduce financial burdens for beginners as they may play in smaller segments for lower costs.

Another potentially strong consumer group could be people who have never played virtual golf. First, this group would include individuals who have never played any type of golf. Considering this potential consumer group showed the highest scores among almost every constraint, it is understandable how important the first experience could be in an emerging sport from consumers' perspectives. That is, service providers should provide their first experience in virtual golf through diverse promotions. For instance, in case of females, the strongest potential customer group, a promotion focusing on terms "family" instead of an individual and "game" rather than competition could be effective from a marketing perspective. That is, it would be necessary to develop a game format to increase basic understanding about virtual golf itself or a training program for customers who have never played virtual golf.

Next, individuals who have only played outdoor golf would be in the potentially strong consumer group as well. Since this group already has experiences in golf, service providers should have a slightly different approach rather than focusing on the first experience. In this study, individuals who have only

played outdoor golf reported a relative higher score in skill/confidence. Considering virtual golf simulation systems have been utilized as an effective technology to enhance golfers' performance of professional golfers (Sommer & Rönqvist, 2009), this activity could be marketed as an attractive compliment to outdoor golf. In fact, outdoor golf courses may want to consider partnering with virtual golf providers as increases in skill would reduce perceived constraints for both activities.

It is also important to note that because virtual golf is based on actual outdoor golf, consumers may hold expectations of a certain amount of skill and expense to participate in the activity. As such, these consumers may have unrealistic expectations causing them to perceive the constraints to be greater than they actually are. Given leisure constraints, as measured in this study, were subjectively perceived constraints, the challenge for marketers may be less about removing and constraints to participation, but about changing perceptions. This may be especially true for the less experienced group whose expectations or perceptions of constraints may be unreasonable due to lack of knowledge of the activity. For this group, education about skill requirements may diminish unreasonable expectations. Similarly, educating lower income consumers about value received in relationship to price may also alter cost perceptions. Using education to reduce perceived constraints may be effective, as consumers who are educated have a better basis for developing reasonable expectations (Greenwell, 2007).

Limitations and Future Research

In terms of limitations, this study's examination was limited to an examination of six common constraints. While the literature supports these constraints, future research could seek to identify additional constraints such as technological, logistical, or cultural that may be unique to virtual sport participation. Similarly, future studies focusing on why individuals play virtual golf and how they negotiate constraints would help generate better strategies for sport managers to encourage potential consumers to participate.

Furthermore, this study was limited to Korean consumers, therefore, diversifying the research population would add to this line of research, by allowing researchers to understand if these findings are context specific or can be generalized across markets. Specifically, it would be especially meaningful to look at countries with similar weather conditions (e.g. long and cold winter), city environments (e.g. crowded megacities), and golf industry status (e.g. relatively expensive green fees) like the Republic of Korea.

References

- Alexandris, K., & Carroll, B. (1997a). An analysis of leisure constraints based on different recreational sport participation levels: Results from a study in Greece. *Leisure Sciences*, 19, 1–15.
- Alexandris, K., & Carroll, B. (1997b). Demographic differences in the perception of constraints on recreational sport participation: Results from a study in Greece. *Leisure Studies*, 16, 107–125.
- Alexandris, K., & Carroll, B. (1999). Constraints on recreational sport participation in adults in Greece: Implications for providing and managing sport services. *Journal of Sport Management*, 13, 317–332.
- Alexandris, K., Du, J., Funk, D., & Theodorakis, N. D. (2017). Leisure constraints and the psychological continuum model: a study among recreational mountain skiers. *Leisure Studies*, 36, 670–683.
- Alexandris, K., Funk, D. C., & Pritchard, M. (2011). The impact of constraints on motivation, activity attachment, and skier intentions to continue. *Journal of Leisure Research*, 43, 56–79.
- Alexandris, K., Tsorbatzoudis, C., & Grouios, G. (2002). Perceived constraints on recreational sport participation: Investigating their relationship with intrinsic motivation, extrinsic motivation and amotivation. *Journal of Leisure Research*, 34, 233–252.
- Beattie, S., Fakehy, M., & Woodman, T. (2014). Examining the moderating effects of time on task and task complexity on the within person self-efficacy and performance relationship. *Psychology of Sport and Exercise*, 15, 605–610.
- Casper, J. M., Bocarro, J. N., Kanters, M. A., & Floyd, M. F. (2011). “Just let me play!”—Understanding constraints that limit adolescent sport participation. *Journal of Physical Activity and Health*, 8(s1), S32–S39.
- Chick, G., Hsu, Y., Yeh, C., & Hsieh, C. (2015). Leisure constraints, leisure satisfaction, life satisfaction, and self-rated health in six cities in Taiwan. *Leisure Sciences*, 37, 232–251.
- Cho, D., & Price, T. (2016). Examining the leisure constraints affecting international collegiate students’ participation in intramural sport programs. *International Journal of Sport Management, Recreation, & Tourism*, 24, 22–41.
- 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>

- Cotterill, S. T., Sanders, R., & Collins, D. (2010). Representative experimental design issues in observing golfer pre-performance routine behaviour. *International Journal of Sport Psychology*, 41, 403–414.
- Craig, C. M., Berton, E., Rao, G., Fernandez, L., & Bootsma, R. J. (2006). Judging where a ball will go: the case of curved free kicks in football. *Naturwissenschaften*, 93, 97–101.
- Crawford, D. W. & Godbey, G. (1987). Reconceptualizing barriers to family leisure. *Leisure Sciences*, 9, 119–127.
- Crawford, D. W., Jackson, E. L., & Godbey, G. (1991). A hierarchical model of leisure constraints. *Leisure Sciences*, 13, 309–320.
- Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Funk, D. C., Alexandris, K., & Ping, Y. (2009). To go or stay home and watch: Exploring the balance between motives and perceived constraints for major events: A case study of the 2008 Beijing Olympic Games. *International Journal of Tourism Research*, 11, 41–53.
- Garvin, N. (2016). Millennials are ditching golf because it's too hard and boring. *New York Post*. Retrieved from: <http://nypost.com/2016/08/06/millennials-are-ditching-golf-because-its-too-hard-and-boring/>
- Godbey, G., Crawford, D. W., & Shen, X. S. (2010). Assessing hierarchical leisure constraints theory after two decades. *Journal of Leisure Research*, 42, 111–134.
- Greenwell, T. C. (2007). Expectations, industry standards, and customer satisfaction in the student ticketing process. *Sport marketing quarterly*, 16, 7–14.
- Greenwell, T. C., Fink, J. S., & Pastore, D. L. (2002). Perceptions of the service experience: Using demographic and psychographic variables to identify customer segments. *Sport Marketing Quarterly*, 11, 233–241.
- Hambrick, M. E., Simmons, J. M., & Mahoney, T. Q. (2013). An inquiry into the perceptions of leisure work-family conflict among female Ironman participants. *International Journal of Sport Management and Marketing*, 13, 173–199.
- 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, 465–486.

- Han, H., & Hwang, J. (2014). Investigation of the volitional, non-volitional, emotional, motivational and automatic processes in determining golfers' intention: Impact of screen golf. *International Journal of Contemporary Hospitality Management*, 26, 1118–1135.
- Han, H., Hwang, J., & Woods, D. P. (2014). Choosing virtual–rather than real–leisure activities: An examination of the decision–making process in screen-golf participants. *Asia Pacific Journal of Tourism Research*, 19, 428–450.
- Hennessey, S. M., Yun, D., & MacDonald, R. (2010). The economic impact of golf to a tourist destination. *Sport Research Intelligence Sportive (SIRC)*.
- Hubbard, J. & Mannell, R. C. (2001). Testing competing models of the leisure constraint negotiation process in a corporate employee recreation setting. *Leisure Sciences*, 23, 145–163.
- Hudson, S., Walker, G. J., Simpson, B., & Hinch, T. (2013). The influence of ethnicity and self-construal on leisure constraints. *Leisure Sciences*, 35, 145–166.
- Iso-Ahola, S. (1981). Leisure counseling at the crossroads. *The Counseling Psychologist*, 9, 71–74.
- Iso-Ahola, S., & Mannell, R. (1985). Social and psychological constraints on leisure. In M.G. Wade (Ed.). *Constraints on leisure* (pp. 111–151). Springfield, IL, Charles C. Thomas.
- Jackson, E. L. (1983). Activity-specific barriers to recreation participation. *Leisure Sciences*, 6, 47–60.
- Jackson, E. L. (1988). Leisure constraints: A survey of past research. *Leisure Sciences*, 10, 203–215.
- Jackson, E. L. (1990a). Trends in leisure preferences: Alternative constraints-related explanations. *Journal of Applied Recreation Research*, 15, 129–145.
- Jackson, E. L. (1990b). Variations in the desire to begin a leisure activity: Evidence of antecedent constraints? *Journal of Leisure Research*, 22, 55–70.
- Jackson, E. L., Crawford, D. W., & Godbey, G. (1993). Negotiation of leisure constraints. *Leisure Sciences*, 15, 1–11.
- Jackson, E. L., & Dunn, E. (1988). Integrating ceasing participation with other aspects of leisure behavior. *Journal of Leisure Research*, 20, 31–45.
- Jackson, E. L., & Dunn, E. (1991). Is constrained leisure an internally homogeneous concept? *Leisure Sciences*, 13, 167–184.
- Jeng, M. Y., Pai, F. Y., & Yeh, T. M. (2017). The virtual reality leisure activities experience on elderly people. *Applied Research in Quality of Life*, 12, 49–65.

- 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, 176–204.
- Jun, J., & Kyle, G. T. (2011b). Understanding the role of identity in the constraint negotiation process. *Leisure Sciences*, 33, 309–331.
- Jun, J., Kyle, G. T., & Mowen, A. J. (2009). Market segmentation using perceived constraints. *Journal of Park & Recreation Administration*, 27(1), 35–55.
- Kay, T., & Jackson, G. (1991). Leisure despite constraint: The impact of leisure constraints on leisure participation. *Journal of Leisure Research*, 23, 301–313.
- Kim, I. (2014). *A new direction and business plan for the golf business in Korea: Strategies to attract customers to the domestic market* (Unpublished master's thesis). Massachusetts Institute of Technology, MA.
- Kim, S., Andrew, D. P. S., & Greenwell, T. C. (2009). Consumption behaviour in an individual combat sport: Cross-national differences between American and South Korean mixed martial arts fans. *International Journal of Sports Marketing and Sponsorship*, 157–170.
- Kim, N. S., & Chalip, L. (2004). Why travel to the FIFA World Cup? Effects of motives, background, interest, and constraints. *Tourism management*, 25, 695–707.
- 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, 24–39.
- Kim, Y. K., & Trail, G. (2010). Constraints and motivators: A new model to explain sport consumer behavior. *Journal of Sport Management*, 24, 190–210.
- Ko, Y. J., Park, H., & Claussen, C. L. (2008). Action sports participation: Consumer motivation. *International Journal of Sports Marketing and Sponsorship*, 9, 111–125.
- Kobriger, S., Smith, J., Hollman, J., & Smith, A. (2006). The contribution of golf to daily physical activity recommendations: how many steps does it take to complete a round of golf? *Mayo Clinic Proceedings*, 81, 1041–1043.
- LaForge-MacKenzie, K., & Sullivan, P. J. (2014). The relationship between self-efficacy and performance within a continuous educational gymnastics routine. *International Journal of Sport & Exercise Psychology*, 12, 206–217.

- Lee, D., Cheon, W., Judge, L. W., Shin, H., & Kim, K. (2012). Motives and marketing stimuli affecting eSports consumption: Cross-cultural perspectives. *International Journal of Sport Management*, 13, 203–223.
- Lee, H. G., Chung, S., & Lee, W. H. (2013). Presence in virtual golf simulators: the effects of presence on perceived enjoyment, perceived value, and behavioral intention. *New Media & Society*, 15, 930–946.
- Lee, D., & Schoenstedt, L. J. (2011). Comparison of eSports and traditional sports consumption motives. *Journal of Research in Health, Physical Education, Recreation, Sport, & Dance*, 6(2), 39–44.
- Liu, J. D., Chung, P. K., & Chen, W. P. (2014). Constraints of recreational sport participation: measurement invariance and latent mean differences across sex and physical activity status. *Perceptual and motor skills*, 119, 363–376.
- Loucks-Atkinson, A., & Mannell, R. C. (2007). Role of self-efficacy in the constraints negotiation process: The case of individuals with fibromyalgia syndrome. *Leisure Sciences*, 29, 19–36.
- Lyu, S. O., & Lee, H. (2016). Latent demand for recreation participation and leisure constraints negotiation process. *Journal of Leisure Research*, 48, 431–449.
- Lyu, S. O., & Oh, C. (2014). Recreationists' constraints negotiation process for continual leisure engagement. *Leisure Sciences*, 36, 479–497.
- Mannell, R. C., & Iwasaki, Y. (2005). Advancing quantitative research on social cognitive theories of the constraint-negotiation process. In E. L. Jackson (Ed.), *Constraints to leisure* (pp. 261–275). State College, PA: Venture Publishing.
- Marx, K. (1992). *Marx's capital: A student edition*. London, UK: Lawrence & Wishart.
- Meyer, D. F., & Surujlal, J. (2014). Participation in sport and recreation in a poor community: perceived constraints and opportunities: physical activity and health. *African Journal for Physical Health Education, Recreation and Dance*, 20 (Supplement 2), 182–195.
- Mullin, B. J., Hardy, S., & Sutton, W. A. (2014). *Sport marketing*. Champaign: Human Kinetics.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Petrack, 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.

- Petrick, J. F., Backman, S. J., Bixler, R., & Norman, W. C. (2001). Analysis of golfer motivations and constraints by experience use history. *Journal of Leisure Research*, 33, 56–70.
- Pritchard, M. P., Funk, D. C., & Alexandris, K. (2009). Barriers to repeat patronage: the impact of spectator constraints. *European Journal of Marketing*, 43, 169–187.
- Ruseski, J. E., Humphreys, B. R., Hallman, K., & Breuer, C. (2011). Family structure, time constraints, and sport participation. *European Review of Aging and Physical Activity*, 8(2), 57–66.
- Samdahl, D. M., & Jekubovich, N. J. (1997). A critique of leisure constraints: Comparative analyses and understandings. *Journal of Leisure Research*, 29, 430–452.
- Scott, D. (1991). The problematic nature of participation in contract bridge: A qualitative study of group-related constraints. *Leisure Sciences*, 13, 321–336.
- Scott, D., & Munson, W. (1994). Perceived constraints to park usage among individuals with low incomes. *Journal of Park and Recreation Administration*, 12(4), 79–96.
- Searle, M. S., & Jackson, E. L. (1985). Socioeconomic variations in perceived barriers to recreation participation in would-be participants. *Leisure Sciences*, 7, 227–249.
- Shores, K., Scott, D., & Floyd, M. (2007). Constraints to outdoor recreation: A multiple hierarchy stratification perspective. *Leisure Sciences*, 29, 227–246.
- Sommer, M., & Rönqvist, L. (2009). Improved motor-timing: Effects of synchronized metro-nome training on golf shot accuracy. *Journal of sports science & medicine*, 8, 648–656.
- Spivey, L. M., & Hritz, N. M. (2013). A longitudinal study of recreational sport participation and constraints. *Recreational Sports Journal*, 37, 14–28.
- Stevens, J. P. (2009). *Applied multivariate statistics for the social sciences* (5th ed.). New York, NY: Routledge/Taylor & Francis Group.
- Suh, Y. I., Lim, C., Kwak, D. H., & Pedersen, P. M. (2010). Examining the psychological factors associated with involvement in fantasy sports: An analysis of participants' motivations and constraints. *International Journal of Sport Management, Recreation and Tourism*, 5, 1–28.
- The Korea Golf Association (2014). *Korea golf index*. Retrieved from <http://www.kgagolf.or.kr>
- Trail, G. T., & Kim, Y. K. (2011). Factors influencing spectator sports consumption: NCAA women's college basketball. *International Journal of Sports Marketing & Sponsorship*, 13, 60–82.

- Trail, G. T., Robinson, M. J., & Kim, Y. K. (2008). Sport consumer behavior: A test for group differences on structural constraints. *Sport Marketing Quarterly*, 17, 190–200.
- White, D. D. (2008). A structural model of leisure constraints negotiation in outdoor recreation. *Leisure Science*, 30, 342–359.
- Young, I. S., & Pedersen, P. M. (2010). Participants' service quality perceptions of fantasy sports 116 websites: The relationship between service quality, customer satisfaction, attitude, and actual usage. *Sport Marketing Quarterly*, 19, 78–87.
- 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* (Doctoral dissertation). United States Sports Academy. (Publication No. AAT 3285712)