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Testing a Leisure Constraints Model in the Context of Asian International Students

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Abstract

The purpose of the current study was to examine the psychometric properties of a leisure constraints model within the context of Asian international students attending colleges in the U.S. Data were collected from a sample of 116 Asian international students attending a Midwestern university in the U.S. Eight (7 constraints and a dependant) factors were identified through EFA with a promax rotation. Construct validity of leisure constraints was confirmed with a CFA . Among the constraint factors, the Lack of Time found to be the most significant obstacle inhibiting Asian international students from participating in physical activity. Additionally, the results from SEM found that the constraint factors explained a significant amount of variance in the future non-intention in the physical activity participation. The results from the current study provide both theoretical and practical implication for scholars and practitioners as the study found a unique set of constraint factors applicable for Asian international students.

Keywords: leisure constraints, physical activity, cultural barriers, Asian international college students

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Introduction

Developing and testing leisure constraints models has received a considerable amount of attention among leisure and sport scholars due to the facts that they contain psychometric properties of measuring perceptual barriers refraining individuals from participating in leisure activities (e.g., Hubbard, & Mannell, 2001; Hung &Petrick, 2010). One of the distinct features that a leisure constraints model should have is to capture multidimensional aspects of leisure behavior, such as socio-psychological factors, that are involved in the process of decision making in leisure participation (Hubbard & Mannell, 2001). Particularly, research found that individuals often exhibited tendency to weigh negative information more than positive information when evaluating all information in the last stage of decision making process (Kanouse 1984). In other words, negative information plays a more significant role than positive information on decision making. Therefore, the investigation of constraint factors can provide meaningful insights into understanding individuals' decision making in participating in leisure activities.

While some of leisure constraints models provides a useful theoretical framework in explaining various degrees of leisure behavior, the direct adaptation of constraint models in empirical settings should be considered with caution due to the multidimensional nature of leisure preference among individuals (Backman, 1991; Gilbert & Hudson, 2000; Jackson & Dunn, 1987; Shaw & Henderson, 2005). Regarding the dimensionality issue, Godbey, Crawford and Shen (2010) pointed out some major contextual factors that should be considered in investigating an individual's leisure behavior; the nature of leisure activities, "the characteristics of study participants", and the stages of participation. Hence, it appears plausible for scholars to adopt a domain specific approach in the design of leisure constraint research due to the lack of standardized measure of constraint factors. As it turned out, this is evidenced by inconsistent results among constraint studies, and lack of empirical supports hinder scholars from gaining a comprehensive scope on the concept of leisure constraints.

For example, Backman (1991) suggested that the direct adaptation of leisure constraints is implausible due to the impact of contextual factors such as demographics or SES which play a significant role in the formation of leisure constraints. In addition,

studies revealed that the level of leisure involvement differs to a great degree as a function of demographic characteristics such as age, gender, and race (Alexandris & Carroll, 1997; Jackson & Dunn, 1987; Philipp, 1995). Alexandris and Carroll (1997) provided further empirical evidence in this proposition as they found that minority social groups experienced a higher level of perceptual barriers in leisure participation than the majority social groups in Greece. Philipp (1995) also posited that racial minorities in the U.S. would experience unique socio-cultural barriers which deprive them of their leisure opportunities. The impact of leisure constraints would be attenuated when the demographic characteristics are not taken into account in the design of research.

The current study was designed to close this gap by investigating the measurement properties of leisure constraints in the context of Asian international college students. Specifically, the purpose of this study was to identify constraint factors that inhibit Asian international students from participating in physical activity. There are three primary reasons in the choice of the study subjects. First of all, the number of international students coming to the U.S. has been continually increased in the past years (Institute of Internal Education, 2014), and Asian international students represent the largest portion by approximately 50 % of the total international student population. Second, as stated, it is desirable to apply the model of leisure constraints in the specific population. International students are considered as minority groups due to their ethnic backgrounds and non-residential alien status in the U.S. This indicates that international students would experience unique challenges living in the U.S. driven from sociocultural differences. Last but not least, multiethnic studies found that the participation rate among international student groups remains at a significantly low level as compared to the majority American students (Msengi, Msengi, Harris, & Hopson, 2011; Yoh, 2009). Asian students exhibited the lowest levels of physical activity participation while Caucasian students were most active in their physical activity participation (Suminski, Petosa, Utter, & Zhang, 2002). Despite several studies which investigated the impact of demographic characteristics in leisure involvement, only a few explored the patterns of physical activity among Asian international students attending colleges in the U.S.

Literature Review

Leisure Constraints Models

Leisure constraints can be defined as factors that inhibit an individual from participating in any leisure/physical activities or events (Crawford & Godbey, 1987; Godbey, Crawford & Shen, 2010; Jackson, 2000). In accordance with the initial

conceptualization of leisure constraints, Crawford and Godbey (1987) proposed a theoretical framework of leisure constraints which divide constraint factors into three broad categories: intrapersonal, interpersonal, and structural constraints.

Intrapersonal constraints refer to individuals' inner psychological states or attitudinal attributes which have negative impacts on leisure preferences such as lack of confidence, lack of skills, or lack of social support while interpersonal constraints focus more on the lack of social relationship factors such as reference groups. Structural constraints are characterized as external factors that prevent individuals from participating in leisure activities (Godbey & Crawford, 1987). In their later study, Crawford, Jackson and Godbey (1991) improved the leisure constraints model by imposing a hierarchical structure among leisure constraints which take the relative impact of the constraints into account. The hierarchical model of leisure constraints suggested that intrapersonal constraints play the most proximal role in leisure participation while structural constraints are the most distal factor in the process of decision making in leisure (Crawford et al., 1991).

Although the hierarchical model of leisure constraints advanced by Godbey and Crawford (1987) have been taken for granted in the leisure studies, its validity or generalizability has been questioned due to the fact that the model does not take individual characteristics, such as demographic backgrounds, into account (Backman, 1991; Jackson & Dunn, 1987). The measure of leisure activity is ambiguous since individual preference in the choice of leisure activities varies to a great extent as a function of unique individual characteristics such as demographics (e.g., Alexandris & Carroll, 1997) or SES (e.g., Howard & Cromption, 1984; Godbey, 1985). Dimensionality issue lead to the lack of standardized measures in leisure constraints, and many researchers advocated for a context or domain specific approach in the design of study (Godbey, et al., 2010).

Such lack of empirical support among constraint studies raises concerns on the direct adaptation of leisure constraints in an empirical setting. Jackson and Dunn (1987) urged that the measure of leisure constraints should take contextual factors (e.g., demographics or leisure activity) into account in the design of research. Alexandris and Carroll (1997) further discussed the impact of demographic characteristics in the measure of constraint factors. More specifically, they found that non-traditional populations would experience unique sets of perceptual leisure constraints as a function of different culture, values, and attitudes toward leisure activities. Philipp (1995) also

indicated that racial minorities in the U.S. form a distinct set of leisure constraints as compared to the majority American population. The result suggests that the adaptation of leisure constraints should be carefully designed by taking unique characteristics of the population into account. Thus, it is highly recommended to test the validity of the leisure constraints by taking contextual factors into account. One of the venues in this regard is to examine the construct validity of the leisure constraint model to the non-conventional population.

Recently, Kim and Trail (2010) modified the traditional constraints model in which constraint factors are classified as either internal or external constraints. They noted that the concept of intrapersonal and interpersonal constraints are conceptually overlapping and redundant, which lead to the ambiguity in the empirical analysis. In this regard, they suggested that internal constraints encompass both intrapersonal and interpersonal constraints as these factors have been often highly correlated in empirical settings while the general idea with respect to the hierarchical structure among constraint factors is still the same (Kim & Trail, 2010). More specifically, the modified model also imposed a hierarchy of relative importance between internal and external constraints as internal constraints play a more significant role than the external constraints in leisure participation. This indicates that individuals must deal with the internal level of constraints, such as lack of interest, before they confront external constraints, such as lack of time (Crawford et al., 1991; Kim & Trail, 2010).

Internal constraints are conceptualized as individual underlying psychological cognitions that inhibit leisure activities (e.g., lack of confidence, lack of interest, or lack of reference groups). In contrast, external constraints refer to the social, environmental or physical conditions which refrain an individual from participating in leisure activity (e.g., lack of time, lack of infrastructures, or cultural barriers). While their model was conceptualized in the context of spectator sport, the model could be also applied in the context of physical activity participation since the general idea of the model is initially driven from the leisure constraints model by Godbey and Crawford (1987). Thus, the current study primarily uses the leisure constraints model modified by Kim and Trail (2010) in order to avoid conceptual ambiguity inherent in intrapersonal and interpersonal constraints.

Asian International College Students and Their Participation in Physical Activity

There has been an increase in the number of international students in higher education in the U.S. The number of international students studying at higher education level has increased by 7% (55,000) to a record of 819,644 in 2013 from 2012 (Institute of International Education (IIE), 2014). The significant growth of the international students in higher education is primarily driven by the increase of Asian students from China, Korea, and India representing 49% of the total international students in the U.S (IIE, 2014). It is also noticeable that there is no country representing more than 5% of the total other than these top three countries. Due to the facts that international students leads to a significant positive economic influence and they can provide high quality skills, many American universities and colleges are devoting their effort to recruit more international students than ever before. Consequently, it seems critical for universities to understand unique needs of international students in support of their adjustment in the university.

Given the non-resident alien status of Asian international students, several studies revealed unique socio-cultural challenges that international students have confronted (Dipeolu, Kang, & Cooper, 2007; Msengi, Harris, & Hopson, 2010; Zhao, Kuh, & Carini, 2005). According to Zhao et al. (2005), the majority of international students experience difficulties in adjusting their lives in the U.S. due to a variety of issues such as, language barriers and cultural differences. Such challenges have direct negative impacts on the psychological well-being of international students. Research found that Asian international students exhibited symptoms of psychological disorder such as loneliness, depress, anxiousness, and paranoid (Cheung, 2011).

Participation in physical activity could be one of the effective remedies to reduce various challeges and improve overall quality of lives of international students (Yan & Cardinal, 2013; Zhao, Kuh, & Carini, 2005). Yan & Cardinal (2013) reported that regular participation in physical activity could provides physiological benefits such as decrease a likelihood of obesity, chronic diseases, and cardiovascular diseases. Participation in physical activity could also bring psychological benefits such as reducing stress, depression, and increasing one's self-esteem (Mori, 2000; Yoh, 2009). However, the level of involvement in physical activity among Asian international students remains at a significantly low level (Yan & Cardinal, 2013).

Campus Recreation Administrators

Campus recreation departments provide a variety of leisure programs designed to meet the physical activity needs of college students. However, Kilpatrick, Hebert and Bartholomew (2005) found that the level of involvement in physical activity declines drastically during the college years. The low level of participation in physical activity among college students indicates that the campus recreation departments do not effectively address the needs of students in physical activity. Segmenting the general body of student based on several criteria such as demographics could be the first step to develop the recreation programs aimed at meeting the unique needs of a diverse student body. As stated, the level of involvement in physical activity among international students remained at a significantly low level as compared to their majority Caucasian student counterparts, indicating that the existing recreation programs fail to meet the needs of international students (Yan & Cardinal, 2013). In this regard, it is necessary for the campus recreation administrators to understand factors that refrain international students from participating in physical activities. By doing so, campus recreation administration can provide quality programs for international students.

Purpose of the Study

The current study was designed to investigate the psychometric properties of the leisure constraints in the context of Asian international students attending at universities in theU.S. More specifically, there are two major purposes of the current study. First of all, this study aimed at testing the construct validity of a leisure constraints model for an unconventional population, specically for, Asian international students, with modified constraint scales. Second, the study was designed to test a mediation model in which the internal constraint plays a role as a mediator in the path from the external constraint to the future non-intention in order to examine the plausibility of the hierarchy proposition between constraint factors. Last, the study intended to provide useful information for the campus recreation administrators in development of effective leisure programs for Asian international students.

Methodology

Sample

Data were collected from a sample of 116 Asian international students attending a Midwestern university in the U.S. Outliers and unengaged cases were detected by examining the standardized scores of each variable. As of 116 participants, the standard deviation of one participant from China was found to be 0 indicating that the respondent

answered all the questions with identical responses and thus, this case was eliminated from the data. Not all outliers were excluded since the score does not simply imply that the responses are unreasonable, but those outliers clearly deviated from the expected ranges of response were removed. List-wise deletion was employed in handling missing values and outliers in order to keep the information contained in the case other than missing or outlier values. No systematic missing patterns were found from the remaining sample except for the unengaged response (*n*= 1). As a total, 115 cases were retained for the further data analysis.

The average age of the sample was 25 and the average length of staying in the U.S. was approximately 3 years. Of the 115 participants, 42.6 % were male (*n* = 49) and 57.4% were female (*n* = 66). The largest portion of the sample with respect to the nationality was collected from South Korea (26.1 %, *n* = 30), and China (26.1 %, *n* =30), followed by Japan (24.3%, *n* = 28), Taiwan (13 %, *n* = 15) and India (10.4 %, *n* = 12). In terms of the class level, 50.4 % (*n* = 58) were undergraduate students and 49.6 % (*n* = 57) were graduate students.

Questionnaire - Procedure

For the purpose of this study, the operational definition of physical activity was chosen as ranging from competitive and structured events (e.g., intramural, club) to any informal or unstructured form of exercise, sports, recreation, or hobbies that are not associated with activities as part of one's regular job duties or physical movement. These activities include team and individual sports as well as sports and physical activities that are done informally with others or alone.

The constraint items for this study were created based on the leisure constraints model modified by Kim and Trail (2010) in which higher order factors are classified either as internal or external constraints. In addition, sub-dimensions under each higher order factor was driven from the traditional model advanced by Godbey and Crawford (1987). However, the majority of survey items was further modified and created in order to address the unique characteristics of Asian international students. As Crawford et al. (2010) noted, there is no standardized measure of leisure constraints and the majority of the constraint studies have used their own items in accordance with the context, domain, and/or population of the study. This is because of the fact that no existing scales can be directly adapted in the examination of leisure constraints (Backman, 1991; Jackson & Dunn, 1987). Additionally, the principal investigator conducted focus group interviews

with three Korean international students for instrument development. Modified survey items were reviewed by two experts in order to establish content validity.

From the leisure constraints models by Godby and Crawford (1987) and Kim and Trail (2010) and the extensive literature review, discussion with experts and focus group interviews, 9 dimensions of leisure constraints have emerged: Lack of interest, Lack of facility, Lack of time, Lack of confidence, Lack of reference groups, Lack of accessibility, Lack of awareness, Language barriers, and Cultural barriers. Additionally we included a future non-intention as a dependent variable measured with three items. Each constraint dimension was measured with multiple items. As a total, there were 31 items assessed on a 7-Likert scale ranging from 1 strongly disagree to 7 strongly agree. A correlation table with means and standard deviations is shown in Appendix A.

Statistical analysis

LISREL 9.1 was used to perform structural equation modeling (SEM) in which the factor structures of the leisure constraints measurements were tested. Maximum likelihood (ML) estimation was chosen because initial examination of the data did not show evidence of excessive non-normality. The analysis followed three major stages. Firstly, exploratory analysis was conducted for a dimension reduction purpose. Secondly, a series of factor analyses (i.e., first-order and second-order factor analysis) was performed to explore the underlying dimensionality of latent variables of leisure constraints. Lastly, a structural model was tested to investigate the impact of leisure constraints on the participation in physical activity (i.e., future non-intention).

Results

Descriptive Statistics

This study found that the respondents spent approximately 2.8 hours per week for physical activity, while the majority of the respondents recognized the importance of the physical activity (M = 4.1 out of 7). In terms of gender, the result indicated significant gender difference in physical activity participation as male participatns spent more hours (M = 4.1, SD = 3.0) than their female counterparts (M = 1.8, SD = 2.1), t (113) = 4.62, p = .001. In terms of constraint factors, the Lack of Time (M = 4.6) found to be the most significant constraint inhibiting participation from physical activity, followed by Lack of Facility (M = 2.9) and Lack of Accessibility (M = 2.8). Rest of the constraint factors were found to be similar in their scores as ranging from 2.5 (Cultural barriers) to 2.7 (Lack of Confidence).

Measurement Development and Validation

Exploratory Analysis

The PCA was employed as a dimension reduction technique. The initial solutions were obtained using an oblique rotation method (Promax) as a set of items are expected to be correlated. We eliminated several items based on the loadings. More specifically, we dropped the items of which loadings were lower than .50 (three items from lack of awareness and language barriers) or the items that cross-loaded to the great extent (one of the items from lack of interest), and the PCA was rerun. As a result, 24 items were retained as these items found to be most plausible in both theoretical and empirical standpoints. The correlations with means and standard deviations among the remaining 24 variables are presented in Appendix A. Based on the initial solution, eight constructs, 7 constraint factors and 1 dependent factor (future non-intention), were extracted as these eight eigenvalues were larger than 1. All items were loaded on their respective factors. Extracted factors accounted for 75.3% of the common variance cumulatively. Internal consistency of the items was examined to the retained items. The Cronbach's alpha of the extracted subscales ranges from .72 to .87, indicating good reliabilities for the overall scale and the extracted factors (*See* Table 1).

Table 1. Results from the Principal Component Analysis (PCA).

Constraint Factors	Items	Loading	α
Lack of interest	I did not enjoy participating in physical activities in the past	.84	.80
	I am not interested in participating in physical activities	.86	
Lack of reference groups	I don't have family, friends, or acquaintances with whom to do physical activities	.77	.84
	No one asks me to do physical activities together	.83	
	My family, friends, or acquaintances do not like physical activities	.71	
Lack of confidence	I am not skilled enough for any physical activities	.83	.82
	I am not confident in participating in physical activities due to lack of skills	.83	
	I do not feel confident in participating in physical activities	.77	
Lack of facility	Recreation facilities are poorly kept	.70	.82
	I do not participate in physical activities because there are	.75	

	not enough facilities to use		
	Recreation facilities are too crowded	.82	
	I do not like facilities offered	.85	
Lack of time	I do not have enough time to participate in physical activities	.87	.84
	I do not participate in physical activities because I am always busy with my school (e.g., homework or studying for exams)	.89	
	I do not participate in physical activities because of my personal matters such as family or friends	.84	
Lack of accessibility	Transportation takes too much time	.80	.72
	There are not enough places to do physical activities close to me	.78	
	I do not have any transportation	.67	
Cultural barriers	Physical activities are not considered to be an important part of our life in our culture	.83	.78
	Our culture does not put high value on physical activities	.81	
	Physical activities are normally for a specific group of people in our culture	.71	
Future intention	I will not participate in physical activities this season	.91	.87
	I will not participate in physical activities next season	.82	
	I will not participate in physical activities in the future	.73	

Confirmatory Factor Analysis

Restricted factor analysis (or commonly called Confirmatory Factor Analysis) followed the PCA to obtain a clear and unique latent factor patterns in accordance with the hypothesized constraint model. In order to handle the identification issue, one of the factor loadings from each dimension was fixed to be a value of 1 so that a unique set of numerical solutions for each of the parameters can be identified (Cudeck, 1989). A Heywood case (i.e., interest2) occurred and we decided to keep the item for conceptual reasons; as a remedy, the error variance of the item was constrained to be zero in order to avoid a negative error variance. A CFA using 24 observed variables comprising eight constructs (7 constraint and 1 dependent constructs) indicated that the eight-factor

model fit the data adequately (χ^2=244, p<.001, df=225, NFI = .84, CFI = .93, RMSEA = .060).

The results are shown in Table 3, and the factor loadings were all statistically significant at the .001 level. Additionally, indicators of each unobserved latent variable (i.e., constraint factors) were highly loaded onto their respective constructs and standard errors were small. Factor loadings range from the lowest value of .59 (i.e., cultural barriers 3) to the highest value of .98 (future non-intention 2) which are higher than the threshold .50. Examination of fitted residuals also indicated that the fitted model explains the correlation matrix adequately. All AVE estimates were larger than .5, which also exceed the inter-correlations among constraint items, providing evidence of both convergent and discriminant validity. Consequently, the construct validity of 24 survey items as indicators of 7 constraint factors and 1 future intention factor as a dependent variable appear to be acceptable, indicating that the first order factor model held quite adequately to the data. The factors are correlated to a moderate degree, which lead to the investigation of a second order factor model (*See* Table 4).

Table 3. First Order Factor Model Parameter Estimates (Confirmatory Factor Analysis).

Factors	Items	Factor Loadings								Residuals	AVE
		F1	F2	F3	F4	F5	F6	F7	F8		
Lack of Interest	Interest1	.67								.55	.73
	Interest2	1.0								.(HC)	
Lack of	Reference1		.84							.22	.63
Reference groups	Reference2		.84							.49	
	Reference3		.70							.60	
Lack of	Confidence1			.80						.35	.60
Confidence	Confidence2			.78						.40	
	Confidence3			.74						.46	
Lack of Facilities	Facility1				.64					.59	.54
	Facility2				.72					.48	
	Facility3				.70					.51	
	Facility4				.85					.27	
Lack of Time	Time1					.83				.31	.64
	Time2					.87				.25	
	Time3					.68				.54	

Lack of	Access1	.86		.26		.50
Accessibility	Access2	.64		.59		
	Access3	.59		.66		
Cultural barriers	Culture1		.88	.30		.56
	Culture2		.71	.29		
	Culture3		.63	.51		
Future non-	Nonint1			.76	.42	.74
intention	Nonint2			.98	.03	
	Nonint3			.83	.30	

Notes: fixed zeros are omitted, HC: Heywood case

Table 4. Inter-Factor Correlations among First-order Factors.

	F1	F2	F3	F4	F5	F6	F7	F8
Facility	1							
Non-intention	.15	1						
Time	-.01	.12	1					
Reference	.21	.23	.21	1				
Confidence	.12	.23	-.03	.31	1			
Culture	.21	.26	.13	.09	.16	1		
Access	.15	.16	.09	.25	.30	.30	1	
Interest	.24	.22	-.02	.06	.28	.15	.27	1

Measurement Model: Second-order Factor analysis

The confirmatory second-order factor analysis was followed by putting a structure on the correlations among the seven first-order constraint factors. The structure among first order factors were established based on the leisure constraints model modified by Kim and Trail (2010) in which two higher order constraint categories are involved. More specifically, a second-order model with two higher-order factors (i.e., Internal and External constraints) was fitted to the data. In dealing with the model identification issue, Rindskopf and Rose (1988) suggested that a minimum of two first-order factors per second order factor is necessary for the model to be identified, and our data met with this suggestion.

A second-order factor analysis using 21 leisure constraint items, comprising 7 constraint factors, were fitted to the second-order factor model in which 7 first-order

factors are explained with two higher order factors. More specifically, the internal constraint consists of three first-order factors (i.e., Lack of interest, Lack of reference groups and Lack of confidence) while the rest of the first-order factors (Lack of facility, Lack of time, Lack of access and Cultural barriers) load on the external constraint. Model fit indices showed that the second factor model fits the data well (χ^2=244.93, *df* = 181, *p* = .0011, NFI = .83, CFI = .95, RMSEA = .055) and the number of residuals exceeding |. 10| were 33 while only 4 residuals were greater than .20 indicating that the fitted model explains the correlation matrix of the original data set quite adequately. The parameter estimates for this model are in Table 5.

Table 5. Loadings of Lower Order Factors on Higher Order Factors.

	Second-order	
First order	Internal	External
Lack of interest	0.51	
Lack of confidence	0.75	
Lack of Reference	0.43	
Lack of facility		0.46
Lack of accessibility		0.69
Lack of time		0.17
Cultural barriers		0.52

Notes: fixed zeros are omitted. The correlation between second order factors is .74

Results indicated the strength of a higher order relationship between first-order factors and their respective second-order factors. With regard to the loadings, lack of confidence (.75) was indicated as a stronger measure of internal constraint followed by lack of interest (.51) and lack of reference groups (.43), with all three parameters being statistically significant (*t*>.1.96). In the case of external constraint, lack of accessibility (.69) was the strongest indicator, followed by cultural barriers (.52), lack of facility (.46), and lack of time (.17), with all four being significant (*t*>1.96). Time was not highly loaded onto the external constraint; however, we decided to keep the time factor in the model as it is statistically significant and conceptually plausible. The correlation between the second-order factors (i.e., Internal and External constraints) is .74, which raises concern on the discriminant validity between internal and external constraints. However, we decided to keep the second-order factor model for theoretical plausibility.Theoretical

justicification with respect to the dimensionality issue about second-order model is discussed in the discussion section.

Testing a Structural Model

A second order factor model was tested in SEM for an omnibus test of the leisure constraints model which dictates the paths from the internal and external constraints to the future non-intention as a dependent latent variable. Model fit indices indicated that the structural model holds adequately to the data except for the relative chi-square test (χ^2=342.72, *df* = 242, *p* < .001, NFI = .83, CFI = .94, RMSEA = .06). However, relative chi-square value tends to be inflated by the sample size and the non-normality. The structural equation for the model can be stated as;

Non-intention = .51*Internal Constraint + .17*External Constraint, Error=57,
R^2=.43

Accordingly, a significant portion of the variation of Future-non intention is accounted for by its respective latent constraint factors (i.e., Internal and External constraints). Given that the correlation between internal and external constraints are high (.74), the result should be interpreted with caution. This indicates that the mediation model could be considered in the structural equation model in order to test a hierarchical relationship between internal and external constraints in the structural model (Crawford et al., 1991; Kim & Trail, 2010). We examined the mediating effect of "Internal Constraint" in the path from External Constraint to the Future non-intention, however, all coefficients were found not to be significant so the results are omitted. We did not deliver a post-hoc modification since the hypothesized model appeared to be good fit to the data.

Table 6. Correlation matrix among second-order factors and non-intention.

	Internal	External	Non-int
Internal	1		
External	0.75	1	
Non-Int	0.64	0.57	1

Discussion and Conclusion

The purpose of the study was to test the construct validity of the leisure constraints model in the context of Asian international college students. As the results showed, the study confirmed that the leisure constraint types (i.e., first order factors) conceptualized by Godbey and Crawford (1987) hold adequately with a non-traditional population (i.e., Asian international students) and the higher-order relationship existed between the first order factors (e.g., Lack of interest, Lack of Time etc.,) and their respective higher order factors (i.e., internal or external constraint). Additionally, the structural model found that internal and external constraints explained a significant amount of variance of the future intention in physical activity participation, indicating that leisure constraint factors play a significant role in individuals' decision in physical activity participation. However, a hierarchy of importance between higher order constraint factors (i.e., internal and external constraints) was not confirmed by the current study as the structural model did not support the mediating effect of the internal constraint to the external constraint. Additionally, the result also revealed that internal and external constraints are highly correlated. This gives rise to the question as to whether higher order factors are distinct constructs.

The Dimensionality of Leisure Constraints model

The current study utilized a modified version of the leisure constraints model by Kim and Trail (2010), in which intrapersonal and interpersonal constraints are classified as internal constraints and socio-environmental factors (i.e., structural constraints) are classified as external constraints. Results from the second order factor analysis confirmed the higher order factor model, indicating that interpersonal and intrapersonal constraints could be conceptualized as a internal constraint while external constraints could be seen as distinct construct (Kim & Trail, 2010). However, as noted, it should be warned that the internal and external constraints are highly correlated (r = .74).

Despite the constraints model by Kim and Trail (2010) merged interpersonal and intrapersonal constraints into the internal constraint, initial ideas are still the same with the traditional linear hierarchical model by Crawford et al. (1991) as the model imposed the hierarchy of relative importance between higher order constraints. The hierarchy proposition by Kim and Trail (2010) also posits the idea that internal constraints play a proximal role and external constraints play a distal role in leisure participation. In other words, constraint factors are navigated in sequential order as internal constraints (or intrapersonal and interpersonal constraints) precede external constraints in the process

of leisure participation decision making (Crawford et al., 1991; Kim & Trail, 2010). For example, an individual must deal with internal constraints, such as lack of confidence, prior to confronting external constraints, such as lack of time, for leisure participation to take place. If the individual fail to negotiate with internal constraints, he/she does not even consider the possible external constraints. However, the current study fail to support this proposition as the mediation model was found not to be significant.

The dimensionality issue with respect to the hierarchy proposition gives rise to the question as several studies have alrady pointed out that the constraint factors tend to be intercorrelated (e.g., Auster, 2001; Gilbert & Hudson, 2000; Shaw & Henderson, 2005). As an example, Auster (2001) urged that intrapersonal constraints are considerably influenced by socio-structural factors. The current study also could not support the hierarchy proposition between internal and external constraints because higher order factors (i.e., internal and external constraints) are highly correlated.

With regard to the arguments against the hierarchy proposition, as Godbey, et al. (2010) pointed out, the traditional hierarchical constraints model should not be "too literally" adopted and interpreted. They warned that the conflicting results with respect to the linear hierarchy proposition between constraints does not suggest that the adaptation of the hierarchical propostion should be abandoned. Instead, the results among the constraints studies should be interpreted as an expansion of the linear hierarchical proposion as they suggests the mutual or simultaneous interactions among the constraint factors (Godbey et al., 2010). The classification of the constraints still provide us with a meaningful insight into understanding the multifaceted nature of the leisure participation. Accordingly, Godbey et al. (2010) stated that "(I)t will be valuable for researcher to go beyond simply describing or classifying leisure constraints to the more challenging process of understanding how they are formed (i.e., the underlying causes of leisure constraints). We believe the important value of the previously mentioned alternative arguments is not to disconfirm the hierarchical leisure constraint theory, but rather to point out the potential and direction for expanding on the current model (p. 118)".

It is still valuable to discuss about the relative importance between leisure constraints in temrs of their role in the process of leisure decision making along with the hierarchy proposition, while it is a reluctant approach to simply judge that individuals would experience the same level of leisure constraints without taking contextual factors (e.g., gender role perceptions or cultural norms) into account. In this regard, the current

study contribute to the acculmulation of the knowledge in the field of leisure constraints as the study found that the perceived importance of leisure constraints among Asian college students varys significantly as a function of cultural norms.

Asian International Students and Physical Activity Participation

The non-hierarchical relationship and a high level of correlation between internal and external constraints could be explained with the unique feature of Asian culture in which collectivism is pervaded as a significant cultural norm or social value. Within the society where collectivistic culture is pervasive, individual lives are strongly influenced by or connected to the group or organization where individuals are involved (Yan & Cardinal, 2013). According to Yan and McCullagh (2004), Chinese international college students pointed out the socialization as a major reason for participating in physical activity whereas competition was found to be the primary reason for American college students. This indicates that motivation factors are significantly influenced by the cultural norms, individualistic vs. collectivistic culture.

Overall, the level of participation in physical activity among Asian international students remained at a significantly low level as they spent only 2.8 hours per week. In terms of gender, male participants (M = 4.1) spent significantly more time in physical activity than their female (M = 1.8) counterpart. Gender has been one of the most frequently cited demographic factors influencing in leisure participation (e.g., Taymoori, Rhodes, & Berry, 2010; Yan, & Cardinal, 2013; Yoh, 2009). For example, Taymoori et al. (2010) found that Asian countries hold strong gender-role perception in which physical activities are generally considered as masculine in nature. Such gender bias toward physical activity inherent in Asian culture may inhibit Asian women from participating in physical activity. Shaw and Handerson (2005) also stated that intrapersonal constraints could lead to the formation of structural constraints as a function of gender role stereotyping.

While the Lack of Time (M = 4.3) was found to be the most significant constraint factors, the result does not simply imply that other constraints are not significant considering the dynamic nature of individual cognitive process in leisure decision making. It should be reiterated that the internal constraints, such as lack of confidence or interest, could play a role as an antecedent in the shape of external constraint, such as lack of time (Gilbert and Hudson, 2000). Additionally, Barnett (2000) noted that one of the shortcomings from using negatively worded items is the tendency for participants to generally respond items in a positive or socially desirable manner. This implies that the

respondents could have utilized the Lack of Time as a rationalization of other constraints.

Aside from the empirical justification, time has been always one of the most significiant constraint factors inhibiting leisure participation. Several studies found that international college studnets spent a significant amount of time for studying which deprive them of leisure opportunities (Yan, & Cardinal, 2013; Yoh, 2009). Keeping a good academic standard has been regarded as a major reason for the majority of international students as they are willing to sacrifice their other activities to succeed in academics.

Additionally, in terms of gender, Asian women could possibly exhibit self-limiting behavior (i.e., internal constraint) which contribute to the formation of external constraints, such as lack of time. More specifically, women may feel a sense of “guilt” when they use their time for physical activity rather than playing a role as a “care-taker” within the male dominant society (Yan, & Cardinal, 2013). While the lack of time could be categorized as a external constraint, the lack of time could be shaped as a result of self-limiting behavior or lack of social support (i.e., internal constraints). Women may feel lack of social support which could also lead to the formation of additional constraints. As it turned out, such biased gender role perception deprive women of their opportunity from full enjoyment of physical activity. This could also explain the high level of correlation between internal and external constraints while further empirical justifications are necessary.

Significance of the Study

Recently, more and more leisure scholars recognized the limitations of traditional leisure constraints model and started paying particular attention to the nature of the individual/group characteristics, such as SES (Chang, Fang, Ling, & Tsai, 2011), age (Liechty, & Yarnal ,2010), gender (Son, Kerstetter, & Mowen, 2008) and/or nationality (Zhang, Zhang, Cheng, Lu, & Shi, 2012), on the formation of leisure constraints. As mentioned previously, it is because of that the concept of leisure constraints are largely influenced by the socio/culturel perceptions on leisure activities, and thus, the context specific approach would aid our understanding on the nature of leisure constraits. The current study, in this regard, provides meaningful insights into understanding how Asian international students in the U.S. perceive leisure constraints as a function of their unique sociocultural characteristics. There are theorecial and practical implications stemming from the major findings from the study.

One of the significant contributions of the current study is that we identified several unique perceptual constraints applicable for Asian international students such as language and cultural barriers. Significant impact of these constraints (i.e., cultural barriers) suggests that that the adaptation of leisure constraints should always consider the unique aspects of study subjects, while language barriers were not found to be an adequate dimension in our data set. The reason for the insignificant effect of language barriers could be explained with the unique function of sport in human relations in which language barriers do not serve as a medium for communication between interaction partners (Bouet, 1966). However, future study should confirm the impact of language barriers in the various contexts of sport because many studies referred language barriers as one of the biggest challenges that international students have confronted (Zhao, Kuh, & Carini, 2005).

The results of the current study provide practical implications for practitioners in the campus recreation program. As evidenced by the study, Asian international students experience unique set of leisure constraints that may not be viable constraints for Caucasian students (e.g., Cultural barriers, Language barriers, and gender-role perception). This indicates that the administrators in the campus recreation program should take unique characteristics of non-traditional students into account in the development and implementation of recreation programs. Additionally, the study found time to be the most significant barriers preventing Asian international students from participating in physical activity. A research found that Asian international students spend less time to relax and socialize due to the high level of academic pressure as compared to American students (Zhao et al., 2005). Traditionally, rigrous physical activity has been regarded as low social class involvement while reading and studying is relatively valued as high social class involvement. The practitioners may use the questionnaires utilized in the current study so that they can more readily reach the needs of Asian international students.

Limitation & Future Study

The small sample size did not allow us to deliver further data analysis such as the test of measurement invariance across groups (e.g., nationality or gender). Regarding this, it is encouraged to test the validity of the leisure constraints model used in the current study with multiple samples so that cross-validation of the instruments can be examined (Schireiber, Nora, Stage, Barlow, King, 2006). More specifically, while Asian international students expect to share unique psychometric properties stemming from

common identity as Asian, they do differ with respect to the attitudinal and/or cognitive perceptions stemming from the unique aspect of nationality. Thus, future research should further examine the impact of membership status among international students in the application of leisure constraints model.

Secondly, the study tested only a part of theoretical framework advanced by Kim and Trail (2010) as the current study focused exclusively on the constraint factors. It is necessary to investigate constraint factors in conjunction with motivation factors in order to obtain a comprehensive scope on the leisure participation. Hummard and Maennell (2001) stated that an individual employ various coping strategies to overcome constraint factors in the leisure negotiation process. This indicates that the impact of constraint could be attenuated or even eliminated through successful negotiation in leisure participation. Kwon and Trail (2010) also noted that individual decision making is influenced by both motivation and constraint factors and thus, it is necessary to consider both factors in the design of research. From this proposition, future study could include motivation factors by which the impact of constraint could be negated through effective negotiation strategies.

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Appendix A. Correlation matrix with mean and standard deviation among items.

	M	SD																								
Interest1	2.8	1.8	1																							
Interest2	2.7	1.7	.671	1																						
Facility1	2.8	1.2	.161	.186	1																					
Facility2	2.2	1.1	.228	.232	.476	1																				
Facility3	3.6	1.5	.171	.052	.445	.487	1																			
Facility4	2.6	1.4	.265	.290	.543	.606	.615	1																		
Time1	4.7	1.7	-.023	.111	-.037	-.154	-.038	.020	1																	
Time2	4.7	1.6	-.143	.001	-.022	-.138	-.033	-.014	.719	1																
Time3	4.4	1.8	-.011	.037	-.131	-.035	.038	-.069	.569	.587	1															
confidence1	2.8	1.5	.156	.358	.053	.193	.079	.076	-.058	-.085	.043	1														
confidence2	2.8	1.5	.178	.373	.062	.129	.057	.126	-.093	-.093	-.044	.635	1													
Confidence3	2.6	1.5	.183	.355	.089	.139	-.051	.121	-.051	-.159	.007	.592	.559	1												
Reference1	2.8	1.7	-.037	.118	.111	.136	.109	.076	.120	.170	.163	.155	.279	.230	1											
Reference2	2.7	1.7	-.029	.100	.025	.190	.097	.011	.105	.193	.223	.230	.357	.232	.705	1										
Reference3	2.5	1.5	.119	.178	.178	.195	.121	.146	.106	.123	.113	.116	.223	.255	.616	.567	1									
Access1	2.7	1.7	.233	.296	.062	.212	.051	.111	.201	.129	.152	.255	.196	.339	.231	.234	.232	1								
Access2	2.6	1.7	.115	.206	.103	.352	.321	.186	.005	.091	.149	.208	.196	.121	.246	.256	.186	.549	1							
Access3	3.0	2.1	.120	.224	.012	.085	-.058	.093	.074	-.015	-.063	.258	.189	.291	.160	.012	.120	.509	.358	1						
Culture1	2.4	1.6	.160	.278	.130	.187	.185	.185	.137	.125	.105	.218	.081	.147	.110	.088	.037	.218	.163	.272	1					
Culture2	2.6	1.6	.143	.160	.032	.057	.119	.097	.069	.030	.006	.129	.001	-.022	.121	.050	-.023	.226	.204	.278	.638	1				
Culture3	2.7	1.6	.128	.164	.125	.263	.277	.365	.086	.140	.049	.239	.242	.104	.284	.186	.073	.250	.317	.212	.550	.437	1			
Nonintention1	2.5	1.7	.184	.393	.135	.279	.207	.220	.180	.173	.190	.398	.224	.264	.296	.331	.191	.247	.192	.108	.372	.233	.317	1		
Nonintention2	2.2	1.5	.222	.396	.091	.302	.196	.110	.080	.004	.112	.443	.211	.252	.221	.378	.209	.328	.173	.117	.334	.276	.196	.751	1	
Nonintention3	1.8	1.1	.224	.351	.046	.215	.195	.114	.108	-.014	.053	.258	.126	.211	.215	.290	.232	.351	.175	.111	.361	.323	.177	.587	.823	1