Full Length Research Paper

Perceived constraints of campus recreational sports programs: Development and validation of an instrument

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The aim of the present study was to develop and validate an instrument to measure students' perceived constraints in participating in recreational sports programs in Greek universities. There were 3041 male and female Greek university students who voluntarily participated in the study. Cross-validation procedures using exploratory and confirmatory factor analysis resulted in 25 retained items from the initial item pool, which form the University Sport Constraints Questionnaire (USCQ). Findings also showed a second-order factor structure of students' perceived constraints. In particular, the USCQ items seem to assess nine first-order constraints, which are manifestations of three second-order factors. The USCQ seems to be a valid and reliable instrument for measuring students' reasons for not participating in recreational sports programs.

Key words: Constraints, leisure activities, instrument development, university sport, participation.

INTRODUCTION

Elementary and secondary schools' physical education is usually part of the wider framework of the educational process where in Greece, participation in recreational and sports activities is obligatory until the end of Lyceum.

After the age of eighteen, choice to participate in recreational and sports activities resides within the individual who has to take some important decisions for his/her way of life (Rintaugu et al., 2013). Regarding university students in Greece, their participation in university sports and recreational programs is optional, which opens them to a series of constraints that burden or limit their participation. On the other hand, several authors pointed out the importance of students'

systematic engagement in physical activities due to its social and health benefits (Chung et al., 2013; Rintaugu et al., 2013).

Theories and models of constraints

Constraints are factors that limit or burden participation in sports and recreational programs and consist of a total of causes for non-committing to a specific behavior (Jackson, 1993). Crawford and Godbey (1987) set the bases for the development of the classic theoretical model in the study of constraints. Researchers placed

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constraints under three categories which include intrapersonal, interpersonal and structural.

Crawford et al. (1991) rephrased Crawford's and Godbey's theory in 1987 by creating the hierarchical model of constraints. According to this model, constraints are experienced hierarchically during the decision making process regarding participation in leisure and recreational activities. Intrapersonal constraints appear first, as they are more powerful and affect both desire and motives for action. A person who is affected to a large extent by intrapersonal constraints would find it quite impossible to express his/her willingness to participate in any recreational activities. For this person to deal effectively with intrapersonal constraints, he/she will probably have to overcome interpersonal constraints that result from the lack of company or partner. In the third phase, the person deals with structural constraints where, the person might, through a series of personal negotiation strategies, overcome constraints and participate in an activity, or avoid participating in an activity if the structural constraints prove to be significant.

The hierarchical model of Crawford et al. (1991) was confirmed in practice by Raymore et al. (1993). Researchers found three distinct hierarchically ordered categories of constraints (intrapersonal, interpersonal and structural) within the process of participation in recreational activities. Scott (1991) noted that these categories are closely interrelated and affect each other since a structural constraint, for example lack of time, may lead to lack of company (interpersonal constraint).

Intrapersonal constraints are considered to be personal psychological states and attitudes that mostly inter-affect the preferred activity rather than intervene among preference and participation (Crawford et al., 1991). Intrapersonal constraints refer to personal psychological states that start from the person him/herself. Such factors may be related to personality, attitude or momentary psychological states, such as mood. Examples of such factors include stress, fear, religious views, previous positive or negative experience in relevant activities, the perceived ability of a person to deal with the demands of the activity and the subjective assessment of suitability and availability of various recreational activities (Arb-Moghaddam et al., 2007; Chick and Dong, 2005; Shaw and Henderson, 2005**)**.

Psychological factors that predispose a person to act in a specific way consist of at least three subjective assessments: (a) beliefs about what people are obliged to do, (b) what the person would like to do, and (c) the degree of ability or capability of a person to perform a certain activity (Huston and Ashmore, 1986). People have a repertoire of stable interests regarding recreational activities (or lack of interest) and a repertoire of stable causes for non-participation. These interests and causes are the result of socialization and are produced directly or indirectly by experiences relevant to

recreational activities and various conditions faced by a person (Mannell and Zuzanek, 1991).

Interpersonal constraints are the result of interpersonal interactions or the existence of relations among people who participate in an activity. An example of interpersonal constraints is difficulty in finding a company or a partner willing to participate (Crawford et al., 1991). On the other hand, structural constraints are also referred to as intervening factors, which intervene between a preference/mood for participation and participation itself. Examples of structural constraints are lack of finances, lack of time, and lack of facilities and services offered (Jackson, 2005).

Several instruments have been developed to measure participants' constraints using exploratory or confirmatory factor analysis. Their results showed varying number of distinct constraints depending on the context (Alexandris and Carrol, 1997a; Raymore et al., 1993). However, these studies did not take into account the more complex structure of constraints proposed by Godbey et al. (2010). In particular, it is proposed that the leisure constraints might be organized in three correlated second-order factors, representing the three categories, namely, intrapersonal, interpersonal and structural constraints. Thus in the development of new instrument and validation of existing ones the viability of the proposed second-order structure of leisure constraints should be studied.

Constraints on recreational sports participation

Most of the studies relevant to perceived constraints on recreational sports participation revealed that participants are faced with five or more distinct types of constraints (Alexandris and Carroll, 1999; Alexandris et al., 2001; Chung et al., 2013; Jackson, 1993; Shores et al., 2007). In a review Jackson (1993) study found that there were five factors appear in three studies, six factors appear in two studies and seven, ten, and eleven factors appear in one study.

University students have different characteristics when compared to other population groups such as high school students or the elderly (Casper et al., 2011; Chung et al., 2013; Godbey et al., 2010). University students are young adults who usually study away from home and are financially supported by their families. Apart from the academic activities university students rarely have other important obligations such as permanent job or a family to tend to. As a result they have more spare time in comparison to other adult groups. Moreover, special sport events are organized for university students such as campus recreation programs, intramural games and Universiades, which clearly suggests that they represent a different population group.

Most studies that took place on constraints regarding

participation in sports and recreation activities were conducted in English-speaking countries. From these studies, only a few had university students as their sample (Elkins et al., 2007; Walker et al., 2008; Young et al., 2003). Even fewer studies conducted in Greek universities were related to constraints. Several authors conducted studies with samples consisting of university students (Alexandris et al., 2001; Alexandris et al., 2002; Drakou et al., 2007). These authors focused on students' general attitude towards sports both in and out of campus. However, simultaneous examination of attitudes to sports in and out of campus does not allow the formation of a clear picture of constraints that university students perceive during their decision-making process regarding participation in campus recreational sports programs.

Although several instruments exist for the measurement of constraints in various contexts, there is lack of a suitable instrument for the assessment of constraints faced by university students regarding their participation in campus recreational sports programs. The development of such an instrument and the existence of relevant data will contribute to the understanding of the special problems faced by university students in the decision-making process regarding their participation in sports and recreational activities and will promote research in this area. Thus, the aim of the present study was the development of a valid and reliable instrument for the measurement of constraints perceived by university students during their participation in campus recreational sports programs.

METHOD

Instrument development

A specifically designed instrument, the University Sport Constraints Questionnaire (USCQ) was developed for this study. In its final form, the USCQ consisted of 25 items for assessing nine perceived constraints. For its development and validation, one preliminary, two pilots and one main study were conducted. These studies are presented as follows.

Preliminary study (Item development)

The aim of this preliminary study was to collect and classify perceived constraints by students in order to better understand the particular reasons that prevent them from participating in recreational and leisure services offered by the university. More specifically, the study aimed at: (a) an understanding of the various points of view that prevent university students from participating in campus recreational sports programs and (b) identifying constraints factors that had not previously emerged in the literature.

Sixty-three university students participated on a voluntary basis. Following a short briefing, participants were asked to respond to two open-ended questions. In particular, students wrote down their reasons for not participating at all or not participating on a regular basis in campus recreational sports programs. From their res-

ponses, 20 items were formed. Emphasis was given to the wording of items in order to achieve the best possible comprehension by students.

First pilot study

The aim of the first pilot study was to assess the factor structure of the initial USCQ version. The questionnaire included 67 Likert scale items. As a basis for the formation of the questions, the 20 items that had resulted from the preliminary study were used. The other 47 items were selected after an extensive review of the relevant bibliography (Alexandris and Carroll, 1997a, 1997b; Jackson and Rucks, 1995; Raymore et al., 1993). Responses were given on a 5-point Likert-type scale, with measurement poles ranging from (1) "I strongly agree" to (5) "I strongly disagree."

The sample consisted of 537 students from the University of Macedonia and the Aristotle University of Thessaloniki (57.40% male and 42.60% female, mean age M = 20.97 years, SD = 1.78). Exploratory factor analysis with an oblimin rotation of the axes revealed 17 factors with eigenvalue greater than unity, which explained 62.73% of the total variance. From the 67 items included in the questionnaire the ones that did not load more than 0.40 or loaded in two or more factors were discarded and a new factor analysis was run. This procedure continued until 43 items remained. These items consisted of 11 factors that explained 65.30% of the total variance. Items loading ranged from 0.46 to 0.83 (mean loading = 0.68).

Second pilot study

The aim of the second pilot study was to examine further the factorial validity of the USCQ that resulted from the first pilot study (43 items). The sample consisted of 357 students from the University of Macedonia and the Aristotle University of Thessaloniki (31.8% male and 68.2% female, mean age M= 20.78 years, SD = 1.39). Exploratory factor analysis resulted in 27 items consisting of nine factors with an eigenvalue greater than unity, which explained 72.60% of the total variance. Items loading ranged from 0.61 to 0.87 (mean loading =0.77)

Main study

Three thousand forty-one students studying in seven universities (Table 1) participated in the main study. Of the returned instruments 20 were not in useable form and excluded from subsequent analyses. Of the remaining participants, 48.1% (1453) were male and 51.9% (1568) were female, with a mean age M= 20.84 years (SD = 2.10). The sample included students who did or did not participate in in-campus recreational sports programs organized by campus administrators (Table 1).

Instruments and measurement procedure

The 27-item questionnaire derived from the second pilot study was used for the main study. Authors visited the various campuses and collected the data on field. Participants were recruited using a convenient sampling method. The research instruments were administered on-site after students were given the necessary information and clarifications and reassured their anonymity. The questionnaires were filled out by the students using the paper and pencil format and they returned to researchers immediately.

Table 1. Distribution of participants across universities.

Universities	N	%	Males	Females
Athens University	718	23.6	11.7	11.9
Aristotle University	656	21.6	9.8	11.7
Macedonia University	491	16.1	8.0	8.2
University of Ioannina	485	15.8	6.6	9.4
University of Thessaly	413	13.5	6.5	7.1
University of Patras	182	5.9	3.6	2.3
University of Crete	96	3.2	1.8	1.3
Total	3,041	100	48.1	51.9

Statistical analysis

The factorial validity of the USCQ was examined by implementing two multivariate statistical techniques. The first method was exploratory factor analysis. Prior to factor analysis, it was examined whether the variables' correlation table was suitable for the use of the specific statistical technique. Two tests were used: Bartlett's test of sphericity and Kaiser-Meyer-Olkin's measure of sampling adequacy (MSA). According to Tabachnick and Fidell (1996), statistically significant values of Bartlett's test of sphericity are desirable, and rates greater than 0.60 for MSA indicator are considered quite satisfactory. Item loadings on factors greater than 0.40 were considered statistically significant.

The second method was confirmatory factor analysis. To certify a model fit, five criteria given by AMOS 7.0 (Arbuckle, 1997), which often appear in relevant analyses, were used. These criteria were χ^2, the ratio of the value of χ^2 to the degrees of freedom, Comparative Fit Index (CFI, Bentler, 1990), Tucker-Lewis Index (TLI, Tucker and Lewis, 1973), and Root Mean Square Error of Approximation (RMSEA, Bentler, 1995). Non-statistically significant value of χ^2 shows a good fit with the data. In practice though, this condition is rarely met, especially when the size of the sample is large enough or data deviates from normal distribution (Byrne, 1994). The values of the ratios of χ^2 to the degrees of freedom between 2 and 3 show that the suggested model presents a satisfactory adjustment (Byrne, 1989; Kline, 1998). As far as the rest of the indicators are concerned, values approximate to 0.95 for CFI and TLI and approximate to 0.06 for RMSEA advocate for a better fit to the model (Hu and Bentler, 1999). Finally, the factors' internal consistency was assessed with Cronbach's alpha.

RESULTS

Demographic characteristics of the participants

The age of students who participated in the research ranged from 18 to 35 years with M = 20.84 years. The greater participation rate was observed in ages lower than 23 years. High participation percentages were observed in the second, third and fourth year of studies.

Factorial validity of the USCQ

To investigate the factorial validity of the USCQ, cross-validation procedures were used. More specifically, the sample was randomly divided into two groups. Group A consisted of 1521 university students (711 male and 800 female, 10 questionnaires were not in useable form, M = 20.79 years, SD = 2.02). The data from Group A was used for exploratory factor analysis. Group B consisted of 1520 university students (742 male and 768 female, 10 questionnaires were not in useable form, M = 20.89 years, SD = 2.15). This data was used for confirmatory factor analysis.

Exploratory factor analysis

For the examination of the hypothesis regarding the factor structure of USCQ, we initially conducted an exploratory factor analysis. The analysis resulted in 25 items that form nine factors with eigenvalues larger than one, which explains 69.75% of the total variance (KMO = 0.77, Bartlett's test of sphericity = 7280.8, p = 0.001). It should be mentioned that questions #7 and #18 were removed since preliminary analyses showed low loading. Items loading ranged from 0.44 to 0.94 (mean loading = 0.70). The derived factors were named as follows:

(1) "Beliefs,"the first factor, refers to lack of interest in sports' participation, meaning that the person believes that sports concerns only athletes. (2) "Facilities/Service, "refers to the quality and suitability of athletic facilities and sports programs offered at universities. The third factor, (3) "Lack of Partners," refers to social relations and how the person is affected by the participation of friends in sports programs. (4) "Lack of money," refers to lack of financial resources. The fifth factor, (5) "Individual/ Psychological," refers to self-confidence and the abilities of the person to "be exposed" in front of his/her fellow sports partners. The sixth factor, (6) "Exercise off campus," refers to whether the fact that a student trains outside the university campus consists of a limitation to his/her participation in university sports programs. (7) "Lack of information," refers to lack of information given to university students regarding university sports programs. (8) "Lack of time," refers to lack of time due to other obligations. The last factor, (9) "Accessibility," refers to lack of transportation means and other transportation-related problems.

Confirmatory Factor Analysis (CFA)

Based on the results of the exploratory factor analysis, 25 items were used for the subsequent analysis. Overall, four models were postulated and examined. The first model hypothesized that all responses to USCQ were manifestations of only one factor (uni-dimensional model). The second model postulated a nine-uncorrelated latent factors structure. The next model was

Table 2. Fit indices for the four candidate models of students' perceived constraints.

Model	χ^2	df	χ^2/df	CFI	TLI	RMSEA
Uni-dimensional	7643.75	299	25.56	0.359	0.303	0.137
First order 9 uncorrelated factors	2234.02	301	7.42	0.831	0.818	0.070
First order 9 correlated factors	1396.73	271	5.15	0.902	0.882	0.056
Second order	1053.26	264	3.85	0.930	0.920	0.046

a variation of the previous one, allowing the nine latent factors to correlate with each other. The final model was based on the work of Godbey et al. (2010) and hypothesized a second-order factorial structure of the USCQ. In particular, it was postulated that responses to USCQ could be adequately described by nine latent factors, which in turn were manifestations of three higher-order latent factors, namely intrapersonal, interpersonal and structural constraints. Based on the existing body of the literature, "Beliefs" and "Individual/Psychological" were regarded as intrapersonal constraints, "Lack of partners" as interpersonal constraints and "Facilities/Service," "Lack of money," "Exercise off campus," "Lack of information," "Lack of time"and "Accessibility" as structural constraints.

Results of the confirmatory factor analysis are presented in Table 2. In reviewing the goodness-of-fit statistics, it is evident that the uni-dimensional model should be rejected. Although fit indices of the nine independent-factors model were better than the uni-dimensional model, they were still not in the range of accepted cut-off values. Therefore this model was also rejected. The fit indices of the nine correlated-factors model suggested a substantial improvement over the nine uncorrelated-factors model. Despite that, the RMSEA value indicated a close fit to the model, CFI and TLI values of 0.902 and 0.882 respectively suggested a marginal fit to the data. Finally, goodness-of-fit indices for the second-order model were all indicative of a well-fitting model. Based on the above findings, the second-order model was selected as the most tenable for describing the factorial structure of the USCQ[1].

Loadings of the items on the nine first-order latent factors were statistically significant, yielding values which ranged from 0.41 to 0.95 (mean loading = 0.73) (Table 3). According to Hair et al. (2010) guidelines, convergent validity can be inferred if latent factor's composite reliability (CR) exceeds the value of the average variance extracted (AVE) by this factor and if the AVE is above 0.50. The excel file found at www.watoowatoo.net/sem/sem-stats.xls which is based on the study of Fornell and Larcker (1981) was used for calculations. All first order-factors satisfied the first criterion (CR > AVE), whereas only two factor ("Lack of time" and "Exercise off campus") yielded AVE values below 0.50.

Loadings of the first-order factors on their respective second-order factors are presented in Figure 1. All loadings were statistically significant, except for "Exercise off campus." Moderate positive associations were observed among the second-order factors as these derived from the confirmatory factor analysis solution. Finally, the internal consistency of the nine first-order factors ranged from 0.54 to 0.85.

The constraints resulting from confirmatory factor analysis of the USCQ were categorized by meaning according to the model of Crawford and Godbey (1987). First in importance was "Accessibility" followed by "Lack of information" and "Facilities/Service" (Table 4). These factors belong to the category of Structural Constraints. Fourth in importance was "Lack of partners". This is the only factor in the category of interpersonal constraints.

DISCUSSION

The present study was an initial response to Godbey et al. (2010), who urged researchers to develop instruments to capture perceived constraints in various contexts. Based on Hubbard and Mannell's (2001) recommendations and the existing body of literature, an initial pool of candidate items was selected. Next, application of contemporary methodological and statistical procedures resulted in a 25-item instrument, namely the USCQ. Findings showed that USCQ can be considered a valid and reliable instrument to assess nine-first order and three second-order factors of students' perceived barriers.

With regard to the factorial structure of perceived constraints, Godbey et al. (2010) pointed out that "…it may be profitable to develop second-order factors within the three-dimensional framework and explore the sub-dimensions within each of the three categories" (p. 114). Several researchers in the past attempted to empirically examine the structure of constraints in various contexts (Alexandris and Carroll, 1997a; Raymore et al., 1993; White, 2008). For example, Alexandris and Carroll (1997a), using exploratory factor analysis, found seven dimensionsofleisure constraints,which were subsequently classified conceptually into the three categories proposed by Crawford and Godbey (1987) and elaborated by Crawford et al. (1991). Thus, a second-order factor

Table 3. Confirmatory factor analysis solution of the USCQ.

Items	F1	F2	F3	F4	F5	F6	F7	F8	F9
1	.81 (.66)								
2	.83 (.68)								
3	.78 (.61)								
4	.65 (.42)								
5		.79 (.62)							
6		.66 (.44)							
7		.66 (.44)							
8			.95 (.90)						
9			.51 (.26)						
10				.62 (.38)					
11				.71 (.51)					
12				.41 (.16)					
13					.75 (.57)				
14					.88 (.78)				
15					.69 (.47)				
16						.77 (.59)			
17						.88 (.78)			
18							.61 (.37)		
19							.62 (.38)		
20							.71 (.51)		
21								.75 (.56)	
22								.83 (.69)	
23								.75 (.56)	
24									.82 (.68)
25									.85 (.71)
AVE	.69	.50	.58	.35	.60	.68	.42	.61	.68
CR	.90	.75	.72	.61	.82	.81	.68	.82	.82

Note: All item loadings were statistically significant $p < .001$, Standardized factor loadings are presented in the table along with the Squared Multiple Correlations in parentheses, *F1* = Facilities/service, *F2* = Lack of partners, *F3* = Accessibility, *F4* = Lack of time, *F5* = Individual/psychological, *F6* = Lack of money, *F7* = Exercise off campus, *F8* = Beliefs, *F9* = Lack of information, AVE = Average Variance Extracted, CR = Composite Reliability

organization of constraints was implied. In other studies, authors implemented more advanced statistical procedures (confirmatory factor analysis) to assess directly the intrapersonal, interpersonal and structural constraints, ignoring the possible existence of first-order factors (Nayaupane et al., 2004; Raymore et al., 1993; Walker et al., 2007). Thus, prior studies did not address the potentially more complex structure of constraints.

In the present study, four candidate structures of students' perceived constraints were examined. Results showed that the second-order model had a better fit with the data than the first-order models. In particular, all goodness-of-fit indices (CFI, TLI and RMSA) yielded values within the proposed region of values which supported the tenability of the second-order model. According to this model, the latent structure of the USCQ is characterized by nine distinct, first-order factors which represent the various constraints that university students

faced for participating in campus recreational and sports programs. Moreover, the pattern of inter-correlations among the first-order factors can be adequately explained by the three higher-order factors (Figure 1).

The conceptual basis for a higher-order factor structure of constraints model is in accordance with the proposal of Godbey et al. (2010) and provides empirical data suggesting that the dimensionality of constraints can be better understood if a second-order structure is adopted. In particular, individual's constraints can be classified into three categories, intrapersonal, interpersonal and structural. It seems that this classification is robust irrespective of the specific setting or cultural context (Chick and Dong, 2005; Walker et al., 2005; Walker et al., 2008). However, there are sub dimensions within each of the three categories. It is important for both researchers and practitioners to be aware of the complex structure of constraints. Based on the number and nature of the sub-
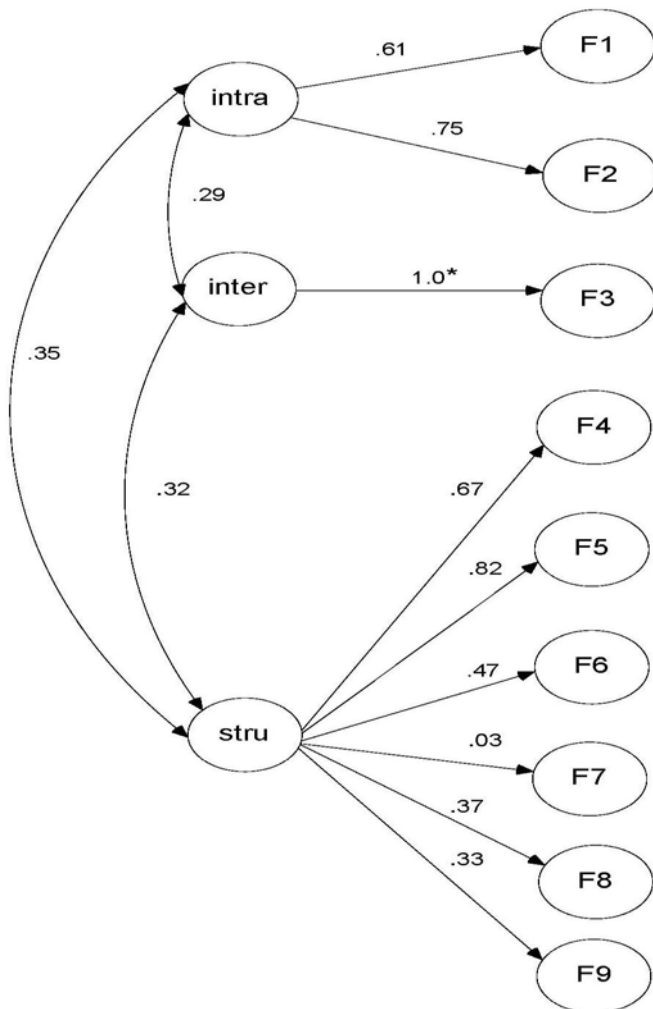
Figure 1. Higher-order structure of the University Sport Constrain Questionnaire. F1 = Beliefs, F2 = Individuals/Psychology, F3 = Lack of partners, F4 = Facilities/Service, F5 = Lack of information, F6 = Lack of money, F7 = Exercise off campus, F8 = Lack of time, F9 = Accessibility, * second-order factor it is represented by only one first-order factor.

ticated statistical procedures suggests that the present findings may be relatively stable and researchers may have increased confidence about the proposed factorial structure of the USCQ. Moreover, the second-order factor organization of constraints, which was empirically tested, is in line with current theoretical perspectives (Godbey et al., 2010). It is worth mentioning that although the loadings of two latent factors ("Lack of time" and "Exercise off campus") were meaningful and substantial their AVE was below the accepted cutoff point of .50. Of course future studies can examine the viability of these two dimensions of USCQ.

The "Lack of time" and "Exercise off campus" were two of the nine first-order factors included in the USCQ. Exploratory as well as confirmatory factor analysis showed that these concepts represent distinct factors. However, it should be noted that although their item loadings yielded meaningful and substantial values their AVE score were below 0.50. "Lack of time" is an important factor which emerged in almost every study of leisure activity constrains. The amount of available time that students may have is in part determined by the lecturing and lab hours and the study load of each university. According to "Lack of time" may fluctuate among universities (e.g. universities with extremely demanding programs vrs university with less demanding programs) and cultures (Walker et al., 2007) . Given that this factor emerged in our EFA's and in order to be consistent with prior literature it was decided to retain it in the model. On the other hand, "Exercise off campus" did not significantly load on the respective second-order factor "Structural." Moreover, neither statistical (modification indices) nor rational considerations justified its linkage to the "Interpersonal" or "Intrapersonal" constraints. A possible explanation for that finding is that "Exercise off campus" constraint may apply for a specific subsample of the initial sample, such as students who are club members in competitive sports further off-campus. Given that these latent factors satisfied only one of the two proposed convergent validity criteria (Hair et al., 2010), future studies should reexamine their viability as distinct dimensions of constrains in sports and recreational activities.

Results showed moderate associations among the intrapersonal, interpersonal and structural higher-order dimensions of constraints. An important advantage of confirmatory factor analysis pertains to the fact that the latent constructs are free of measurement error (Bollen, 1989). Therefore, the observed correlations among the three classes of constraints might better approximate the real ones. Moreover, Godbey et al. (2010) maintained that the model of leisure constraints is circular; meaning that formation of constraints does not necessarily begin with intrapersonal ones. Thus, the magnitude and nature of the second-order associations suggest that changes in one of the class of university students   perceived

dimensions, more efficient interventions can be designed and implemented, since certain first-order factors are more manipulative than others (e.g. Lack of facilities vs Lack of information). For example, students' constraints regarding "Lack of information" can be overcome by implementing specific marketing strategies to increase participants information about campus recreation sports programs which would result in increased participation rate.

An advantage of the present study was the large sample size, which enabled the use a cross-validation approach. To that end, both exploratory and confirmatory factor analyses were implemented. The large number of participants combined with the implementation of sophis-

Table 4. Descriptive statistics, correlation coefficients and internal consistency of the USCQ factors.

USCQ factors	M (SD)	F1	F2	F3	F4	F5	F6	F7	F8	F9
Intrapersonal constraints										
1. Beliefs	1.56 (.87)	(.80)								
2.Individual/Pychological	1.97 (1.02)	.46	(.81)							
Interpersonal constraints										
3. Lack of partners	3.06 (1.04)	.22	.16	(.75)						
Structural constraints										
4. Facilities/service	3.13 (1.02)	.11	$.05^{ns}$	.13	(.85)					
5. Lack of money	2.52 (1.16)	.26	.28	.21	.30	(.79)				
6. Exercise off campus	2.10 (1.08)	.24	$.06^{ns}$	$.03^{ns}$	$.04^{ns}$	$.01^{ns}$	(.62)			
7. Lack of Information	3.34 (1.27)	.16	.16	.26	.61	.35	$.02^{ns}$	(.79)		
8. Lack of time	2.80 (.92)	.34	.27	.24	.14	.27	.21	.23	(.54)	
9. Accessibility	3.66 (1.36)	$.04^{ns}$	.13	.23	.13	.23	$.07^{ns}$	.23	.28	(.67)

Note: Cronbach's alpha in parentheses, *ns* = not statistically significant.

constrains might have a minor but positive effect on other classes of constraints.

It is worthwhile to note that the interpersonal constraints were found to have the highest mean factor values in relation to the structural and intrapersonal ones. On the other hand, in terms of mean scores the three first order-factors, which were perceived by students as deterring their participation in campus recreation programs, were "Accessibility," "Lack of Information" and "Facilities/Service." The distance between students' residence and the university campus as well as the time that is needed to reach athletic facilities ("Accessibility"), especially when students do not own a means of transportation (e.g., bicycle, bike, car), represents the most important constraint factor (Table 4). It should be noted that the majority of the university campuses in Greece are out of the cities and the few dormitories within the campuses can accommodate only a very small percentage of the students. Moreover, having athletic facilities far from campus may also prevent students' involvement in recreation sports programs. The closer students resided to exercise facilities, the more frequently they participated (Reed and Phillips, 2005). It should be underlined that many Greek universities lack the sufficient number of athletic facilities to organize leisure and sport activities. Thus, they use facilities belonging to other agencies or organizations out of the university campus, usually spread around the city. This finding is in accordance with other studies (Deffner and Syrakoulis, 2005; Kouthouris et al., 2006; Syrakoulis, 2005) that pointed out that time/distance often disables choices about free time, resulting in the limitation of student's participation in sports and recreation activities. In campus recreation settings, athletic facilities have to be in an ideal location for students' proximity and access (Cooper and Theriault, 2008). On the other hand, Lindsey et al. (2009)

argued that sport facilities and programs in universities have an impact on a student's decision whether to attend and remain at an institution. Administrators of campus recreation programs should take all the necessary actions to relieve the "Assessibility" constraint, such as provision of regular shuttle buses routes or free access to bicycles.

The second important constraint was the "Lack of Information". According to Godbey (1985), constraints relating to "Lack of Information" lead either to non-participation or to a decrease in participation. This factor seems to be quite determinative, since a large number of students in Greece are not aware of the services offered by providers of the campus recreational sport programs (Kosta and Masmanidis, 2005; Tsigilis et al., 2007). The "Lack of Information" is frequently attributed to the non-effective promotion and advertisement of sports programs (Masmanidis et al., 2002). In the same way, Kouthouris et al. (2006) maintain that recreation pro-grams that are not sufficiently promoted, advertised and publicized tend to fail in mass participation. Use of universities group e-mail addresses or social media networks (e.g. Facebook, Twitter feeds) to inform students about the sport activities may represent an efficient way to remedy "Lack of information" constraint.

The third important constraint was "Facilities/Service." It is obvious that lack of athletic facilities in universities limits sports participation. In a research by Kosta and Masmanidis (2005), it was found that the reasons for non-participation in sports activities were lack of athletic facilities (e.g. courts, fields) and recreational infrastruc-ture (e.g. cycle paths, running paths). In other research, Masmanidis et al. (2002) reported that the lack of suitable athletic facilities and programs as well as the small number of athletic activities offered within Greek universities do not sufficiently meet the needs of sports

activities for the vast majority of the student's population. The above findings in the Greek context support Davis and Shepley's (2002) notion that the design of athletic facilities as well as sports programs should respond to the needs and demands of the majority of students. Campus sport providers can enrich the existing programs by including new and attractive programs to young people sports activities (e.g. zumba, capoeira, power-yoga).

Conclusion

Understanding the factors that inhibit or limit students' participation in campus recreational and sports programs represents an important focus on administration agencies. To that end, the USCQ was developed and validated within the Greek cultural context. A series of advanced statistical procedures were employed to study the structure of constraints. Results showed that a second-order factor structure, comprising the three proposed intrapersonal, interpersonal and structural categories along with their corresponding first-order factors, adequately described students' perceived constraints. These findings advance the existing knowledge on perceived constraints providing empirical evidence which support the hierarchical structure of constraints as proposed by Godbey et al. (2010). Administrators of campus recreation programs can apply the USCQ to determine the factors that deter students from participation. Identifying these constraints provides us with the opportunity to implement effective ways to reduce the influence of students' perceived constraints and enable them to live a more active and healthy way of life. Moreover, the hierarchical structure of constraints suggests that changes in a specific first-order factor (e.g. Lack of Facilities/Service) influences its corresponding higher-order factor (e.g. structural constraints) as well. Future studies may attempt to examine the viability of the proposed model of constrains by examining its structure in other settings or cultural contexts using participants with different characteristics.

Conflict of Interests

The authors have not declared any conflict of interests.

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