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# *Articles*

## Perceived Constraints on Recreational Sport Participation: Investigating their Relationship with Intrinsic Motivation, Extrinsic Motivation and Amotivation

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This study aimed to investigate the influence of constraint dimensions on intrinsic motivation, extrinsic motivation and amotivation. The self-determination theory and the hierarchical model of intrinsic and extrinsic motivationwere used as the theoretical framework. Two hundred and fifty seven (N = 257) adult individuals (residents of the city of Thessaloniki, Greece), who reported participation in some type of sport and physical activity, completed the Sport Motivation Scale and the leisure constraints questionnaire. The results indicated that intrapersonal constraints accounted for 38% of the variance in amotivation, and 15% of the variance in intrinsic motivation. No relationships were revealed between interpersonal and structural constraints and motivation, and between constraint dimensions and extrinsic motivation. These results suggest that intrapersonal constraints act as de-motivating forces for individuals. They support elements of the hierarchical model of leisure constraints, and further clarify the role of motivation in the model. Finally, they suggest that future research should focus on the conceptualization of intrapersonal constraints, and their relations with other social and psychological mediators of motivation that have been proposed in the literature.

KEYWORDS: *Sport motivation, intrapersonal constraints, recreational sport participation*

In a theoretical framework for the study of leisure constraints, Crawford, Jackson and Godbey (1991) developed the hierarchical model of leisure constraints, which was later expanded by the "negotiation" and "balance" propositions (Jackson, Crawford, & Godbey, 1993). These propositions, for the first time, introduced the concept of motivation in leisure constraint research. They suggested that participation results from successful negotiation

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of leisure constraints. Motivation is an important construct in this negotiation: "both the negotiation and the outcome of the negotiation process are dependent on the relative strength of, and interaction between, constraints on participating in an activity and motivations for such participation" (p. 9).

The concept of motivation has not received significant attention in the constraints literature. A study conducted in Greece by Carroll and Alexandris (1997), a recent study conducted in a corporate employee setting by Hubbard and Mannell (2001), and a qualitative research on immigrants' leisure patterns (Stoldoska, 2000), have been the exceptions. All these studies provided evidence for the important role of motivation in the hierarchical model of leisure constraints, and concluded that further research is required. Hubbard and Mannell (2001) suggested, "whether or not motivation is an immediate antecedent and plays a stronger direct role in countering the effects of constraints, when other types of leisure activities, motives, and circumstances are involved, is unclear and will have to be determined by future research" (p. 159). Furthermore, Carroll and Alexandris (1997) stated, "what is required is a greater understanding of how perceived constraints, motives and motivation work in relation to each other, and how constraints can be removed and motivation enhanced" (p. 297).

An important issue in clarifying the relationship between motivation and constraints is the adoption of a theoretical framework for the study of motivation. There have been limited attempts, so far, to apply theories of motivation in relation to the hierarchical model of leisure constraints. The present study used the self-determination theory (Deci & Ryan, 1985) and the hierarchical model of intrinsic and extrinsic motivation (Vallerand & Losier, 1999) as a framework. The self-determination theory suggests that behavior can be intrinsically motivated, extrinsically motivated, or amotivated. Incorporating elements of the self-determination theory, Vallerand and Losier (1999) proposed that social factors influence psychological mediators, which in turn influence motivation. This motivational sequence can provide a very useful framework for the study of constraints.

It can be argued that several types of constraints are consistent with the definitions of these social and psychological mediators. If this argument is correct, it can be suggested that some types of constraints might affect motivation, which in turn influences the levels of participation. Subsequently, some types of constraints might indirectly affect the levels of participation mainly indirectly through the positive or negative influence on motivation. This suggestion might be useful in explaining the weak relationships between constraints and participation found in previous studies (e.g., Alexandris & Carroll, 1997a; Hubbard & Mannell, 2001; Kay & Jackson, 1991). Therefore, the purpose of the present study was to empirically investigate the degree to which constraint dimensions influence intrinsic motivation, extrinsic motivation and amotivation.

## Background to the Study

### *Perceived Constraints and Motivation*

Crawford and Godbey (1987) classified constraints into intrapersonal, interpersonal and structural. Intrapersonal are internal constraints related to individual psychological states and attributes; interpersonal constraints result from interpersonal interaction and include constraints related to inability to find partners; finally, structural are external constraints related to the unavailability of resources required to participate in leisure activities. Crawford et al. (1991) developed a decision-making model in which they proposed that these three categories of constraints are experienced hierarchically. Intrapersonal constraints are most proximal and hence most powerful determinants of participation. Structural constraints, on the other hand, are most distal given that they intervene between existing leisure preferences and activity participation.

Jackson et al. (1993) expanded the hierarchical model of leisure constraints by incorporating the negotiation proposition. They suggested that leisure participation "is dependent not on the absence of constraints (although this may be true for some people) but on negotiation through them. Such negotiations may modify rather than foreclose participation" (p. 4). This proposition explained the contradictory results that have been reported regarded the relationship between constraints and participation (Alexandris & Carroll, 1997a; Kay & Jackson, 1991; Shaw, Bonen, & McCabe, 1991). Motivation is one of the concepts that were introduced along with the negotiation proposition. It was suggested that the interaction between constraints and motivation might be an important factor in the negotiation process, and might determine participation. Recent studies have provided support for the negotiation proposition (e.g., Frederick & Shaw; 1995; Henderson, Bedini, Hecht, & Schuler, 1995), and have further investigated the nature of the negotiation strategies adopted by individuals (Jackson & Rucks, 1995; Samdahl & Jekubovich, 1997).

While the identification of the negotiation strategies has attracted significant attention by researchers, the role of motivation in the decision-making process has not been adequately investigated. Carroll and Alexandris' (1997) study was the first to empirically examine the relationship between constraints and motivation. The bivariate correlations reported by these authors indicated negative and significant relationships between the two constructs. The global measure of motivation, and the univariate statistics used were the limitations of the study, and might have affected the results. It was not made clear through the results if the negative relationship means that motivation affects constraints or if constraints affect motivation. In fact, the authors suggested, "the perception of the strength or importance of constraints may well be a de-motivating source, which then becomes a blocking device as in the case of psychological intrapersonal constraints" (p. 297).

Previous researchers (e.g., Ellis & Witt, 1984; Iso-Ahola & Mannell, 1985) also suggested that constraints might influence motivation; however, no empirical evidence had been provided. Stoldolska (2000), in a qualitative study about changes in leisure patterns of immigrants, concluded the opposite, suggesting, "paradoxically, if analyzed from a multi-period perspective, constraints must be perceived not only as barriers but also as potential motivators for participation" (p. 62). However, this conclusion should not be isolated from the context of the study (leisure behavior of immigrants) and the research design (experience of constraints over time). Finally, Hubbard and Mannell (2001) examined the role of the motivation in the hierarchical model of leisure constraints. The objective of this study was to investigate the multiple interactions between constraints, motivation, negotiation and participation, with the use of structural modeling. The study contributed to the understanding of the hierarchical model of leisure constraints by proposing a new scale to measure negotiation strategies. Furthermore, it tested different theoretical models, building on hypothesized interactions between the above concepts. The results provided support for the constraint-effects-mitigation model. In terms of the role of motivation in the model, Hubbard and Mannell (2001) reported that it is an important factor, which, however, interacts more with negotiation than with participation. This finding was somewhat unexpected, considering the important role of motivation in directing human behavior (Iso-Ahola, 1999; Vallerand & Losier, 1999). Furthermore, Hubbard and Mannell (2001) reported that a higher level of motivation to participate does not lead to a reduction in perception of constraints. This might be another indication that some types of constraints enter early in the individual's decision-making process and affect motivation. The insignificant relationships between motivation, constraints and participation in Hubbard and Mannell's (2001) study might be related to the measurement of motivation. A global measure, including two individual items (health and enjoyment motives), was used. This limitation was addressed by the authors, who suggested that further research is required in order to clarify the role of motivation in the hierarchical model of leisure constraints. In conclusion, it has been widely suggested that motivation is an important factor in individuals' decision-making process; the interaction between motivation and perception of constraints determines, in a large degree, leisure participation. However, empirical research on the interactions between motivation and constraints and in relation to individuals' negotiation strategies is still limited.

*Motivation in Sport and Recreation Settings*

The concept of motivation refers to the forces that initiate, direct and sustain human behavior (Iso-Ahola, 1999). Early studies assumed that two types of motivation exist, namely intrinsic and extrinsic. Intrinsic motivation refers to doing an activity for its own sake, for the pleasure and satisfaction derived simply from performing it (Deci, 1975). When a person is intrinsi-

cally motivated she/he will perform the behavior voluntarily, in the absence of any external rewards (Deci & Ryan, 1985). Intrinsic motivation theory has been widely applied to a variety of leisure related behaviors (see Weissinger & Bandalos, 1995). Contrary to intrinsic motivation, extrinsic motivation pertains to a wide variety of behaviors that are engaged in as a means to an end and not for their own sake (Deci, 1975).

On further explaining the concept of motivation, Deci and Ryan (1985) developed the self-determination theory, and suggested that the intrinsic/extrinsic dichotomy is insufficient to adequately explain human behavior. Instead, there are several types of motivation that fall at different points along a self-determination continuum. This continuum runs from high to low levels of self-determination, as one moves from intrinsic motivation to extrinsic motivation, and finally to amotivation. Individuals are amotivated when there is a relative absence of motivation, and the behavior is done for reasons that are neither intrinsic nor extrinsic (Deci & Ryan, 1985). In this case, individuals have no purpose or expectations for their participation, and they might eventually drop out of the activity (Fortier, Vallerand, Briere, & Provencher, 1995).

Although many researchers originally viewed intrinsic motivation as a global construct, more recent studies (Fortier et al., 1995; Pelletier et al., 1995; Vallerand & Losier, 1994, 1999) have proposed three further dimensions of intrinsic motivation: intrinsic motivation to know; intrinsic motivation toward accomplishment; and intrinsic motivation to experience stimulation. According to Pelletier et al. (1995), motivation to know can be defined as performing the activity for the satisfaction derived from learning, exploring or trying to understand new concepts (e.g., learning how to perform a new sport activity). Motivation to accomplish things can be defined as engaging in an activity for the pleasure and satisfaction experienced when one attempts to reach personal objectives (Vallerand & Losier, 1999). Deci and Ryan (1985) suggested that individuals might interact with the environment in order to feel competent and to create accomplishments. Finally, intrinsic motivation toward experiencing stimulation refers to engaging in activities in order to experience stimulating sensations, such as sensory pleasure, aesthetic experience, fun and excitement.

Deci and Ryan (1985) suggested that extrinsic motivation can also be further divided into external regulation, introjected regulation, and identified regulation. External regulation refers to the traditional view of engaging in the behavior for external rewards (e.g., social recognition, criticism from the social environment). Introjection regulation refers to behaviors that are initiated and regulated by internally controlling imperatives (Blais, Sabourin, Boucher, Vallerand, 1990). These behaviors are reinforced through internal pressures such as guilt or anxiety. Finally, in identified regulation the individual judges the behavior as important, and, therefore, performs it out of choice. The person values or "identifies" with the activity in which he/she engages. Research conducted in several contexts, including sport and exercise, has given support for the validity and reliability of extrinsic and intrinsic

motivational dimensions and amotivation (Pelletier et al., 1995; Vallerand & Losier, 1994, 1999). In conclusion, it is evident that motivation is a multi-dimensional concept consisting of intrinsic motivation, extrinsic motivation and amotivation; these dimensions fall at different points along a self-determination continuum (Pelletier et al., 1995). However, there is limited empirical research on the application of the multi-dimensional model of motivation (Pelletier et al., 1995) in recreational settings.

*The Self-Determination Perspective*

According to the self-determination theory (Deci & Ryan, 1985), there are three psychological needs that are important in energizing human action: the needs for autonomy, competence, and relatedness. These are psychological mediators that have been suggested to influence motivation through cognitive processes. Perceived competence, performance pressure, perceived autonomy, task involvement, and perceived playfulness-leisureliness are similar constructs that have been recently suggested as cognitive mediators (Iwasaki & Mannell, 1999). Furthermore, the self-determination theory suggests that social factors and the social environment (e.g., how other people behave toward us, social values, culture, etc.) positively or negatively influence some of these psychological mediators. Vallerand and Losier (1999) applied this theory to competitive sport settings, and indicated how examples of social events (success/failure, competition/cooperation, and coach's behavior) can affect athletes' motivation. By incorporating elements of the self-determination theory in motivation research, Vallerand and Losier (1999) suggested a motivational sequence: "social factors → psychological mediators → types of motivation → behavioral consequences" (p. 145). This sequence suggests that social factors influence individuals' perceptions of psychological mediators, which in turn determine their motivation.

This motivational sequence can provide a useful framework for the study of constraints. Social related factors, which are the first level of the motivational sequence, have been investigated in the leisure constraints literature. Leisure studies in the areas of gender (e.g., Green, Hebron, & Woodward, 1995; Jackson & Henderson, 1995), ethnic minority groups and immigrants' behavior (e.g., Floyd, 1998; Stodolska, 1998), the elderly (e.g., McGuire, Dottavio, & O'Leary, 1986), and individuals with disabilities (e.g., Henderson, Bedini, Hecht, & Schuler, 1995) have provided strong evidence for the influence of the environment on leisure behavior. However, none of these studies empirically linked these social-environmental related constraints with motivation. The psychological mediators, which are the second level of the motivational sequence, seem to correspond with intrapersonal constraints. Crawford and Godbey (1987) defined intrapersonal constraints as "individual psychological states and attributes, which interact with leisure preferences rather than intervening between preferences and participation" (p. 122). Perceived skills and fitness levels, perceived self-competence, subjective evaluations of the appropriateness of opportunities, perceived awareness,

and negative attitudes related to past experiences are all examples of constraints that have been conceptualized as intrapersonal (Crawford & Godbey, 1987). Most of these constraints correspond to the conceptualization of the psychological mediators, as suggested by theorists and researchers (e.g., Deci & Ryan, 1985; Iso-Ahola, 1989; Iwasaki & Mannell, 1999).

Based on this discussion, it could be argued that some types of constraints might influence motivation, which might influence participation and subsequent aspects: constraints → motivation → participation and subsequent aspects (see Figure 1). If this sequence is verified, it suggests that in the hierarchical model of leisure constraints (Crawford et al., 1991) some types of constraints might affect the level of participation indirectly through the positive or negative influence on motivation. This suggestion might help to explain the weak relationships between constraints and participation and the contradictory results reported so far (e.g., Alexandris & Carroll, 1997a; Kay & Jackson, 1991). In conclusion, the self-determination theory (Deci & Ryan, 1985) and the motivational sequence proposed by Vallerand and Losier (1999) have been shown to be useful theoretical frameworks for the study of sport behavior. We argue that these theoretical frameworks can be useful in explaining the role of motivation within the hierarchical model of leisure constraints (Crawford et al., 1991). There have been no attempts so far to empirically investigate the influence of perceived constraints on intrinsic motivation, extrinsic motivation and amotivation.

*Purpose of the Study*

The purpose of this study was first to investigate the degree to which intrapersonal, interpersonal and structural constraints influence intrinsic motivation, extrinsic motivation and amotivation, and second to test the re-

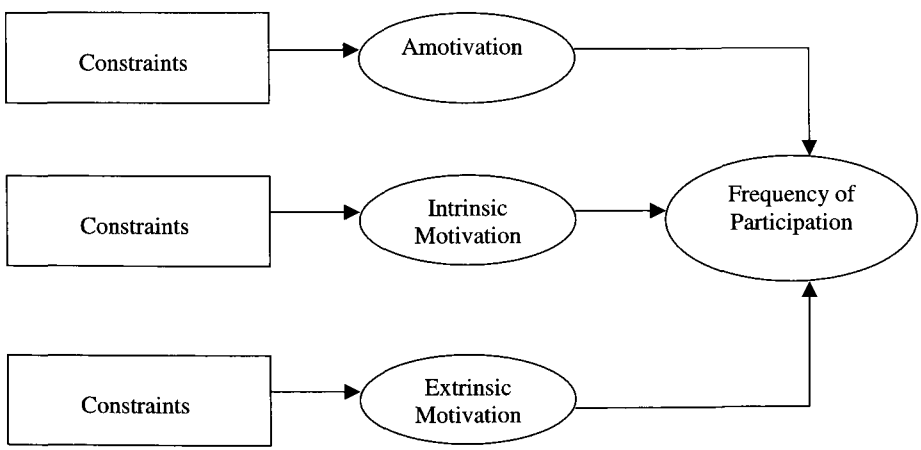


*Figure 1.* A Proposed Model of the Relationships between Constraints, Motivation and Frequency of Sport Participation

lationship between motivation and frequency of sport participation. The proposed interactions between constraints, motivation and participation are presented in Figure 1. The multi-dimensional measure of sport motivation (Pelletier et al., 1995) was used to measure motivation, while the hierarchical model of leisure constraints (Crawford et al., 1991) was used as the theoretical framework to study constraints.

## Method

### *Participants and Procedure*

The data presented in this study are part of a wider survey that investigated sport participation-related issues among the adult population in the city of Thessaloniki, Greece. It should be pointed out that the term "sport" in the present study, was defined as sporting activities that take place during leisure time (recreational sports). Respondents were provided with a list of twenty-two sporting activities in order to have a clear idea about which activities should be considered as recreational sports. Alexandris and Carroll (1997a) developed this list considering the Greek culture. It was reported to successfully capture the range of recreational sports undertaken by the Greeks (Carroll & Alexandris, 1997). The list included team sports, such as basketball, football and volleyball, fitness related activities such as aerobics, weight training and dancing, and individual and outdoor activities, such as jogging, swimming, and hiking. Walking was the most debatable activity. Since almost all activities involve walking the term "walking for exercise purpose" was used.

For accessibility reasons we targeted a specific area of the city. Based on our experience, this was one of the areas with a middle socio-economic profile. It should be noted that the objective of this study was not necessarily to produce results representative of the population of the city, but to test theoretical models. Prospective respondents were identified by visiting every fifth house in six streets, which were randomly selected, following Veal's (1992) suggestions. The distribution of the questionnaire took place on weekends and weekdays during both daytime and evening hours. Six hundred individuals were contacted and 450 of those completed the questionnaires (response rate 75%).

Self-reported measures of sport participation revealed that 257 individuals of the total sample participated in at least one of the sporting activities during the twelve months prior to the survey (57% annual participation rate). These 257 sport participants were the sample of the present study. The limitations of the measurement of participation should be addressed. Self-reported methods of participation might suffer from a response error, that is, the difference between actual and reported participation (Chase & Harada, 1984). Self-reported measures of sport participation, however, have been used widely in similar studies (e.g., Alexandris & Carroll, 1998; Hubbard & Mannell, 2001; Raedake & Burton, 1997). An analysis of the participation levels indicated that 43% of the sample reported that they participated on a

daily basis, and another 36% reported participation on a weekly basis. On the other hand, 12% of the participants reported that they participate less than once a month, and 9% reported that they participate on a monthly basis.

The limitations regarding the sample size should also be addressed. Breaking the sample into participation groups further reduced the sample size (e.g. participation less than once a month, 9% = 24 individuals), and analysis based on these groups should be interpreted with caution. The demographic characteristics of the participants indicated that women (55%) and single individuals (62%) were the majority. The mean age of the participants was 31 years old ($SD$ = 11.5). Finally, in terms of the level of education, university graduates (37%) were the majority in the sample, followed by those with a secondary level of education (32%).

*Research Instruments*

Constraint: The leisure constraint scale developed by Carroll and Alexandris (1997) was used to measure constraints. This scale had been developed and standardized in the Greek population in sport settings. Respondents were asked to evaluate the importance of each of the 29 statements as limiting factors for their sport participation. A seven point Likert-type scale ranging from very important (7) to not important (1) was used.

Motivation: The Sport Motivation Scale (SMS, Pelletier et al., 1995) was used for the measurement of motivation. This is composed of three subscales assessing the three motivational constructs, that is: a) intrinsic motivation (12 items): measuring intrinsic motivation to know (e.g., "for the pleasure it gives me to know more about the sport that I practice"), to accomplish things (e.g., "for the satisfaction I experience while I am perfecting my abilities"), and to experience stimulation (e.g., "for the pleasure I feel in living exciting experiences"); b) extrinsic motivation (12 items): measuring external regulation (e.g., "because people around me think it is important to be in shape"), introjected regulation (e.g., "because I must do sports to feel good about myself"), and identified regulation (e.g., "because it is a good way to learn lots of things which could be useful to me in other areas of my life"), and c) amotivation (4 items, e.g., "it is not clear to me anymore; I do not really think my place is in sport," "I used to have good reasons for doing sports, but now I am asking myself if I should continue doing it"). Respondents were asked to evaluate each item on a 7 point Likert-type scale ranging from strongly agree (7) to strongly disagree (1). The SMS has been used in a variety of sport and exercise settings. The vast majority of the studies reported very good results in terms of validity and reliability (e.g., Pelletier et al., 1995; Vallerand & Lossier, 1994, 1999). The scale was translated into Greek by professional translators, and was adjusted and proofread by two sport psychologists who had extensive experience in motivation research. A qualified Greek teacher finally reviewed the instrument in order to ensure appropriate language.

## Results

### *Constraint Dimensions*

A principal component analysis was performed on the constraints scale. The components with eigenvalues greater than 1.0 were retained and rotated with both orthogonal and oblique rotations. Both methods gave similar results. Orthogonal rotation was retained for conceptual simplicity and ease of description (Tabachnick & Fidell, 1989). The analysis revealed a conceptually clear factor structure. The seven factors that emerged accounted for 68% of the variance and were defined as follows: Individual/psychological (six items), time (five items), lack of knowledge (four items), facilities (four items), accessibility/financial (four items), lack of partners (three items), interest/negative past experiences (three items). The values of alpha for reliabilities of the sub-scales were satisfactory, as they ranged from .65 to .86. The results of the principal component analysis, descriptive statistics of the scales, and the alpha scores are presented in Table 1. The factor structure revealed is conceptually clear and similar to previous structures reported by studies conducted in the same country (e.g., Alexandris & Carroll, 1997b; Carroll & Alexandris, 1997) but also in North America (see Jackson & Scott, 1999). The lack of time, facilities, accessibility/financial, and lack of partners dimensions were reported by the majority of the studies conducted in North America and employed similar methodological designs (e.g., Jackson, 1993; Jackson & Henderson, 1995). The individual/psychological dimension has been consistently revealed by studies conducted in Greece (e.g., Alexandris & Carroll, 1997b; Carroll & Alexandris, 1997). This dimension, however, seems to be a broad one and includes a wide range of intrapersonal constraints (Jackson, 1993), some of which have been categorized in distinct factors in studies conducted in North America [e.g., health/body (Henderson et al., 1988), and lack of skills (Jackson & Henderson, 1995)].

### *Motivation Dimensions*

The reliability analysis indicated that all the motivation dimensions had good internal consistency reliability (intrinsic scale: alpha =. 92, extrinsic scale: alpha = .84, and amotivation: alpha = .82). All the items contributed positively towards the internal consistency reliability and, subsequently, no changes were made. The intrinsic motivation scale had the highest mean score (4.17), followed by the extrinsic scale (3.59). Finally, the amotivation scale had a mean score of 2.38. Higher scores on the intrinsic and extrinsic scales mean more motivated individuals, while higher scores on the amotivation scale mean more amotivated individuals.

### *The Relationship Between Constraints and Motivation*

*Constraint dimensions and amotivation.* A simultaneous regression analysis was performed with amotivation as the dependent variable and the seven constraint dimensions as the independent variables. As shown in Table 2,

*TABLE 1*
*Principal Component Analysis for the Constraint Scale*

| Individual Items | Psycholog. | Time | Knowledge | Facilities | Accessibility | Partners | Interest |
|---|---|---|---|---|---|---|---|
| Exercise makes me feel tired | .80 | | | | | | |
| Afraid of getting hurt | .72 | | | | | | |
| Feel tired to exercise | .68 | | | | | | |
| Health problems | .68 | | | | | | |
| Not fit enough | .67 | | | | | | |
| Not feel confident | .63 | | | | | | |
| Time: work/studies | | .79 | | | | | |
| Time: family | | .74 | | | | | |
| Time: social commitment | | .74 | | | | | |
| Interrupt my daily schedule | | .59 | | | | | |
| Timetable does not fit | | .57 | | | | | |
| Not know where to participate | | | .81 | | | | |
| Not have anyone to teach me | | | .79 | | | | |
| Not know where I can learn it | | | .64 | | | | |
| Not skilled enough | | | .57 | | | | |
| Poor quality of facilities | | | | .84 | | | |
| Not like the activities offered | | | | .83 | | | |
| Facilities are inadequate | | | | .79 | | | |
| Facilities are crowded | | | | .54 | | | |
| Transportation takes time | | | | | .83 | | |
| No opportunities near my home | | | | | .80 | | |
| Not having transportation | | | | | .75 | | |
| Cannot afford | | | | | .48 | | |
| Friends do not have time | | | | | | .86 | |
| Nobody to participate with | | | | | | .81 | |
| Friends do not like participation | | | | | | .75 | |
| Not interested | | | | | | | .80 |
| Participated and did not like | | | | | | | .78 |
| Not like social situations | | | | | | | .49 |
| Eigenvalue | 7.6 | 3.2 | 2.6 | 1.8 | 1.4 | 1.3 | 1.3 |
| % of variance | 26 | 38 | 47 | 53 | 58 | 63 | 68 |
| Item Mean | 2.8 | 4.1 | 2.2 | 3.6 | 2.6 | 2.9 | 2.2 |
| *SD* | 8.6 | 5.6 | 6.0 | 6.9 | 6.8 | 5.5 | 4.2 |
| Alpha | .82 | .77 | .85 | .84 | .81 | .86 | .65 |

*TABLE 2*
*Simultaneous Regression Analysis for the Prediction of Amotivation*

| Constraint Dimensions | *B* | β | *t* | *P* |
|---|---|---|---|---|
| Lack of Knowledge | .47 | .29 | 4.4 | .001 |
| Lack of Interest | .71 | .24 | 4.0 | .001 |
| Individual/psychological | .23 | .22 | 3.4 | .001 |
| Lack of Time | .17 | .14 | 2.2 | .05 |
| Facilities/services | .15 | .06 | 1.3 | n.s. |
| Accessibility | .15 | .07 | 1.3 | n.s. |
| Lack of Partners | .11 | .06 | 1.1 | n.s. |

$F = 21.3$, $p < .001$, $R^2 = .38$

constraints, in total, accounted for 38% of the variance in amotivation ($F = 21.3$, $p < .001$). The individual/psychological ($t = 3.4$, $p < .001$), lack of knowledge ($t = 4.4$, $p < .001$), lack of interest ($t = 4.0$, $p < .001$), and time ($t = 2.2$, $p < .05$) dimensions contributed significantly to the prediction of amotivation.

*Constraint dimensions and intrinsic motivation.* Intrinsic motivation was entered as the dependent variable in the regression analysis and the seven constraint dimensions as the independent variables. As shown in Table 3, constraints, in total, accounted for 15% of the variance in intrinsic motivation ($F = 6.2$, $p < .001$). The individual/psychological ($t = 2.7$, $p < .005$) and lack of interest ($t = 2.6$, $p < .005$) dimensions contributed significantly to the prediction of intrinsic motivation.

*Constraint dimensions and extrinsic motivation.* The regression analysis, with extrinsic motivation as the dependent variable, indicated that the seven constraint dimensions failed to significantly predict the dependent variable.

*TABLE 3*
*Simultaneous Regression Analysis for the Prediction of Intrinsic Motivation*

| Constraint Dimensions | *B* | β | *t* | *p* |
|---|---|---|---|---|
| Individual/psychological | −.38 | −.20 | −2.7 | .005 |
| Lack of Interest | −.97 | −.18 | −2.7 | .005 |
| Lack of Partners | −.41 | −.12 | −1.8 | n.s. |
| Lack of Knowledge | −.38 | −.13 | −1.7 | n.s. |
| Lack of Time | −.25 | −.15 | −1.7 | n.s. |
| Accessibility | .25 | .12 | 1.7 | n.s. |
| Facilities/services | .02 | .01 | .19 | n.s. |

$F = 6.21$, $p < .001$, $R^2 = .15$

*The Relationship Between Motivation and Frequency of Participation*

A multiple analysis of variance (MANOVA) was performed in order to evaluate the influence of motivation on the frequency of participation. The four participation level groups (daily, weekly, monthly, and less than monthly) were entered as the independent variable the three motivational dimensions as the dependent. The MANOVA revealed a significant effect (Wilk's lambda = .73, $F = 9.2$, $p < .001$). Follow-up univariate analysis of variance indicated that the differences were significant in all the three dimensions, amotivation ($F = 17.6$, $p < .001$), intrinsic motivation ($F = 12.1$, $p < .001$), and extrinsic motivation ($F = 10.1$, $p < .001$).

Each of the significant ANOVA's was followed by Scheffe's post-hoc comparisons to determine between in which groups the differences were statistically significant. As shown in Table 4, the daily participant group (a) had significantly lower scores in amotivation scale than all the other groups. Furthermore, the weekly participant group (b) had significantly lower scores in amotivation scale than the monthly (c) and less than monthly (d) participant groups. Similar trends were revealed in the intrinsic motivation and the extrinsic motivation scales. The daily participant group (a) had significantly higher scores than all the other groups in both the scales. Furthermore, the weekly participant group (b) had significantly higher scores in the intrinsic motivation scale than the two infrequent participant groups (c and d). All the results are presented in Table 4.

*TABLE 4*
*Mean Scores, Multivariate and Univariate Analysis for Participant Groups in Motivation Dimensions*

| | | Amotivation | | Intrinsic Motivation | | Extrinsic Motivation | |
|---|---|---|---|---|---|---|---|
| Participant Groups | N | M | SD | M | SD | M | SD |
| Daily participation (a) | 111 | 1.70 | 0.91 | 5.00 | 1.26 | 4.21 | 1.40 |
| Weekly participation (b) | 91 | 1.90 | 1.12 | 4.31 | 1.27 | 3.59 | 1.35 |
| Monthly participation (c) | 31 | 2.95 | 1.51 | 3.82 | 1.32 | 3.25 | 1.11 |
| Less than Monthly (d) | 24 | 3.05 | 1.01 | 3.64 | 1.30 | 3.35 | 0.92 |
| Univariate $F$ | | $F = 17.6$, $p < .001$ | | $F = 12.1$, $p < .001$ | | $F = 10.1$, $p < .001$ | |
| Scheffe's test Differences between groups | | a + b, a + c, a + d b + c, b + d | | a + c, a + d, b + c, b + d | | a + b, a + c, a + d | |

Wilk's lambda = .73, $F = 9.22$, $p < .001$

A synopsis of the significant relationships between constraint dimensions, motivation and frequency of participation, as revealed by the regression analyses and the MANOVA is presented in Figure 2. The negative significant relationships are indicated by (−), while the positive significant relationships are indicated by (+).

## Discussion

On extending the hierarchical model of leisure constraints, Jackson et al. (1993) proposed that individuals negotiate constraints, and the outcome of this negotiation is dependent on the interaction between motivation and constraints. Carroll and Alexandris (1997) hypothesized that motivation, as a global concept, is antecedent of constraints. The negative bivariate correlations they reported between intrapersonal constraints and motivation did not, however, clarify which concept enters first in the decision-making process. Hubbard and Mannell (2001) proposed different theoretical models in order to test the relationships between motivation, constraints and negotiation. These authors reported no significant relationships between motivation and constraints. In their study, however, motivation was measured by only two items, one of which was related to internal motivation (enjoyment) and the other was related to external motivation (health).

The present study adopted a different approach that resulted in different findings. Using as a framework the self-determination theory (Deci & Ryan, 1985) and the hierarchical model of intrinsic and extrinsic motivation, as proposed by Vallerand and Losier (1999), we hypothesized that some con-

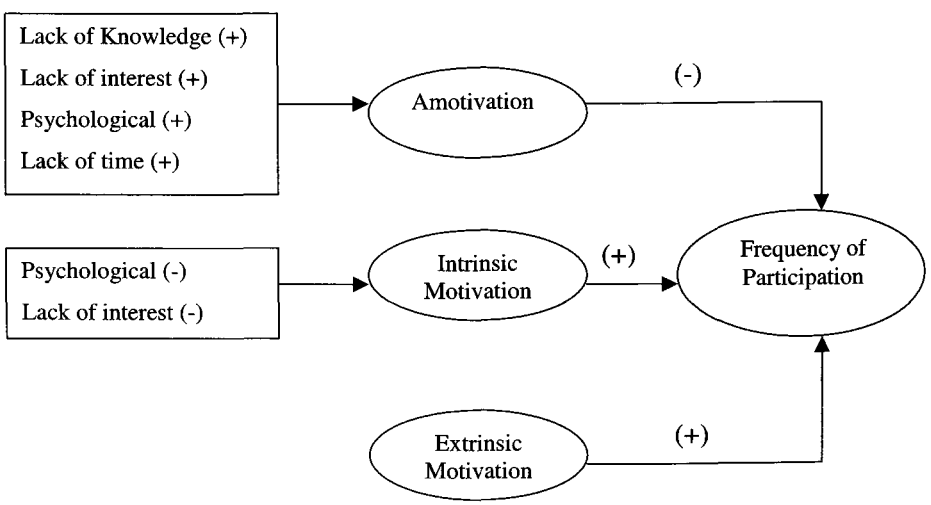


*Figure 2.* Relationships between Constraints, Motivation and Frequency of Sport Participation, as Revealed by the Regression Analyses and the MANOVA

straint dimensions might operate as psychological mediators and act as antecedents of motivation (see Figure 1). The results provided support for this hypothesis. The three intrapersonal dimensions (individual/psychological, lack of knowledge and lack of interest), and marginally the time dimension contributed significantly to the prediction of amotivation, and accounted for 38% of its variance (see Figure 2). Time related constraints can also be experienced intrapersonally since they involve self-design priorities with assessment of their relative worth, need and preferred schedules (Boothby, Tungatt, &Townsend, 1981; Carroll & Alexandris, 1997). If we accept that amotivated individuals will soon drop out from participation (Fortier et al., 1995), these results suggest that intrapersonal constraints might also negatively affect commitment to participation. This suggestion is in line with the results of a recent study conducted by Alexandris, Grouios, Tsorbatzoudis and Bliatsou (2001). These authors investigated the relationship between constraints and commitment to participation, and reported that intrapersonal constraints are the most powerful predictors of commitment. The present study suggests that intrapersonal constraints probably affect commitment through their negative effect on motivation.

On the other hand, no significant relationships were found between interpersonal and structural constraints and amotivation. This can be explained by the hierarchical model of leisure constraints (Crawford et al., 1991). According to the model, intrapersonal constraints enter first in the decision-making process, and they are the most powerful ones. Several studies have supported the power of intrapersonal constraints (e.g., Alexandris & Carroll, 1997a; Raedeke & Burton, 1997; Raymore et al., 1993). Future studies should further emphasize more on the investigation of intrapersonal constraints. Constructs, such as perceived competence, perceived autonomy, task involvement, and perceived playfulness (Deci & Ryan, 1985; Iso-Ahola, 1989; Iwasaki & Mannell, 1999), which act as psychological mediators of motivation, could be used to better concecptualize intrapersonal constraints. This will also help to develop more detailed measurement tools for the whole range of intrapersonal constraints, since there are still validity and reliability related problems of constraint measurement (Hubbard & Mannell, 2001).

The results indicated that intrapersonal constraints predicted significantly, but not strongly, intrinsic motivation. This means that high levels of individual/psychological and lack of interest-related constraints are associated with lower levels of intrinsic motivation (see Figure 2). More research is required in order to further clarify this relationship. Measurement related issues might have affected these results. The Sport Motivation Scale (Pelletier et al., 1995) used in the present study was originally developed for competitive sports. Measuring intrinsic motivation at a more detailed level could help towards further exploring its relationship with intrapersonal constraints. Both Mannell's (1984) and Weissinger and Bandalos' (1995) studies supported the development of domain-specific measures of intrinsic motivation. Finally, this study also indicated that there is no relationship between any type of constraint and extrinsic motivation (see Figure 2). Vallerand and

Loisier (1999) included all the motivational dimensions in their hierarchical model, proposing that psychological mediators might influence them all. Our results did not support this proposition, and they are in line with leisure researchers and theorists who have suggested that the psychological mediators mainly influence intrinsically motivated behavior (Iso-Ahola, 1989; 1999; Iwasaki & Mannell, 1999; Weissinger & Bandalos, 1995).

Previous research has shown that motivation is associated with a variety of positive behavioral consequences such as increased levels of participation, positive emotions, greater persistence and increased sport satisfaction (Iso-Ahola, 1989, 1999; Pelletier et al., 1995). The results of the present study provided evidence for the positive relationship between motivation and frequency of participation. Furthermore, they supported the multidimensionality of the construct of motivation, as proposed by the self-determination theory (Deci & Ryan, 1991). In the present study, the amotivation dimension was shown to be the most powerful predictor of the frequency of participation. According to Fortier et al. (1995), this concept is quite similar to learned helplessness. Amotivated individuals are neither intrinsically nor extrinsically motivated. They do not perceive contingencies between their actions and the outcomes of their actions, and their behavior is out of their control. Fortier et al. (1995) argued that these individuals are likely to drop out of sports. Further research is required to clarify the relationship between amotivation and commitment to participation. It is an issue particularly important for the practitioners, since research has shown that more than 50% of the individuals who start a fitness program drop out in six months or less (Howley & Franks, 1992).

The positive influence of intrinsic motivation on the frequency of participation was expected. The power of intrinsic motivation has been demonstrated in many areas of human behavior, and has been reported by the majority of the studies conducted in leisure and recreation settings (Iso-Ahola, 1999; Weissinger & Bandalos, 1995). Sport and recreation activities provide opportunities for individuals to select behaviors that provide intrinsic rewards. Iwasaki and Mannell (1999) suggested that enriching the leisure repertoire and providing freedom of choice for the participants could enhance intrinsic motivation. Furthermore, issues related to effective programming and service delivery, counseling, and education are important ones for fostering intrinsic motivation.

The present study also provided evidence for the positive influence of extrinsic motivation on the frequency of participation. This is an interesting finding, since leisure behavior, by definition, is considered as intrinsically motivated (Iso-Ahola, 1989). However, it has to be emphasized that the context of the present study was sport for recreational purposes. Participation in sport is not always considered as a pure leisure activity. Studies conducted among sport and exercise participants have reported similar results (e.g., Frederick & Ryan, 1993; Mathes, McGivern, & Schneider, 1992). External reasons, such as health and fitness, attractiveness, general appearance, and weight control, are important incentives towards sport and exercise partici-

pation. Externally prompted behavior sometimes becomes self-determined through the process of identification (Iso-Ahola, 1999). The result of the presented study also supported elements of the personal investment theory, as applied by Raedeke and Burton (1997). These authors reported that individuals who invest a considerable amount of time in physical activity participation place great importance on external motives, such as health and fitness, and achievement-related issues, such as outcome and recognition.

In conclusion, this study provided evidence that intrapersonal constraints interact with motivational dimensions and act as psychological mediators of amotivation and intrinsic motivation. These results support they hierarchy of importance in Crawford et al.' (1991) constraint model. They also suggest that elements of motivation (intrinsic and amotivation) might be intervening factors between intrapersonal constraints and behavioral actions. Subsequently, intrapersonal constraints might affect behavior through their negative effects on motivation. Finally, this study indicated that both the self-determination theory (Deci & Ryan, 1991) and the multidimensional model of motivation (Vallerand & Losier, 1999) are useful theoretical frameworks for studying the relationships between constraints and motivation. Elements of these theories were supported by the study; however, more research is required in order to further clarify the role of intrapersonal constraints as psychological mediators, and the influence of social-environmental factors on intrapersonal constraints and on motivation.

*Study Limitations and Future Research*

The present study examined constraints and motivation in sport and exercise settings, where both intrinsic and extrinsic motivations have been suggested to influence behavior (Raedeke & Burton, 1997). Future studies could examine these relationships in more leisure-oriented settings where the importance of intrinsic motivation is presumably higher. Furthermore, the measurement of constraints and motivation is an issue that should be addressed. After two decades of research on leisure constraints, studies still use a variety of scales and sub-scales to measure constraint and its dimensions. It seems that there is still a disagreement on validity and reliability related issues of the scales (Hubbard & Mannell, 2001; Raymore et al., 1993). Future studies should focus on developing a valid, reliable and detailed scale to measure intrapersonal constraints. In terms of motivation, the present study used the Sport Motivation Scale (Pelletier et al., 1995) that fit with the context of the study. However, alternative measures developed in leisure settings (e.g., the ILM scale developed by Weissinger & Bandalos, 1995) and emphasizing more the construct of intrinsic motivation, could further clarify the relationship between intrapersonal constraints and intrinsic motivation.

As previously discussed, intrinsic motivation was suggested to be a multidimensional concept consisting of motivation to know, motivation to experience stimulation and motivation toward accomplishment. Furthermore, extrinsic motivation consists of external regulation, introjected regulation, and

identified regulation. Future studies could investigate the relationships between these sub-dimensions and perceptions of constraints. Conducting the analysis at a more detailed level might further clarify the role of intrinsic and extrinsic motivation. There might be different patterns of interactions between intrapersonal constraints and motivation sub-dimensions than those found with intrapersonal constraints and the global motivation dimensions.

In the present study the relationship between constraints and motivation was tested independently of the possible influences of other related constructs. The concept of negotiation, for example, was not incorporated into the study. There was not a quantitative measure of negotiation, such as the one developed by Hubbard and Mannell (2001), when this study was conducted. This negotiation scale—with possible improvements in terms of internal consistency reliability—could be used in future studies in order to study negotiations in relation to intrinsic motivation, extrinsic motivation and amotivation. Furthermore, the present study did not examine the influence of motivation and constraints on subsequent aspects of participation such as commitment, involvement and satisfaction. The hierarchical model of leisure constraints (Crawford et al., 1991) suggested that constraints might affect subsequent aspects of behavior (e.g., commitment, loyalty), and this needs further investigation. Research has provided strong evidence for the influence of motivation on these behavioral consequences (Vallerand et al., 1995).

In summary, the present study provided evidence that motivation acts as an intervening variable between constraints and recreational sport participation. Intrapersonal constraints were found to act as de-motivating factors, and affect actual behavior through their negative effects on motivation.

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