

THE PERCEIVED CONSTRAINTS, MOTIVATION, AND PHYSICAL ACTIVITY LEVELS OF SOUTH KOREAN YOUTH

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ABSTRACT

The purpose of this research was threefold; Are Korean youth physically active to promote health during leisure time? What constraints to physical active do youth experience during leisure time? Are there relationships among constraints, motivation, and physical activity level? Of 1 280 youth randomly selected by a multi-staged cluster sampling technique, 1 109 completed questionnaires. The results of this study revealed that vigorously active participation in physical activity during leisure time for Korean youth was found to be negatively correlated with higher levels of constraints; youth who engage in a higher index of motivation tended to have lower overall perceived constraints on physical activity; youth who engage in a higher physical activity levels tended to have higher motivation index on physical activity participation. The findings of this study might be explained by the strength of motivation as an important factor of dealing with constraints and participating more frequently and vigorously in physical activity during leisure time for youth.

Key words: Constraints; Leisure time; Motivation; Physical Activity Levels; Youth.

INTRODUCTION

Although Korean youth represent the most active section of our society, there is genuine concern among some health-related professionals that Korean youth may not be active enough to ensure current or future health benefits (KCDCP, 2006). The prevalence of obesity among youth aged 13 to 19 has almost doubled in the past eight years, going from 8.7% in 1998 to 16.0% in 2005 (KCDCP, 2006). Also, the prevalence of overweight among youth increased from 9.5% in 1998 to 15.5% in 2005. Considering the fact that overweight youth are likely to become obese adults and to be more at risk for adult related health problems, such as heart disease, type 2 diabetes, stroke, and osteoarthritis (USDHHS, 1996; KCDCP, 2006), regular physical activity for youth is required because it can reduce the risk of becoming overweight and obese and developing associated diseases (Ogden *et al.*, 2006). In recognition of the importance of regular physical activity for Korean youth, the professional organizations (Ministry of Health & Welfare, 2000; KCDCP, 2006) developed physical activity guidelines for youth. These guidelines suggested that the minimum amount of physical activity required for health benefits can be achieved through moderate or vigorous activities at least 30 minutes per day for three or more days per week.

It is necessary for youth to be encouraged to be physically active because habits learned in childhood are continued through adulthood and sedentary living early in life may lead to inactive habit in adulthood (Malina, 1996; Perkins *et al.*, 2004). Furthermore, considering the

fact that youths' attitudes about physical activities and health behaviours provide a window of opportunity for the prevention of some chronic diseases (Kuh & Cooper, 1992; Corbin & Pangrazi, 1996), more research is needed to understand the potential barriers or constraints that may restrict youth's participation in physical activity during leisure time. Especially, in order to implement preventive strategies that are likely to enhance physical activity participation of youth during their leisure time, the identification of the perceived constraints on participating in physical activity, is necessary.

Since the early 1980s, many studies have analyzed constraints to leisure participation in different settings and among different populations. Most of the previous studies (Alexandris & Carroll, 1997; Rocklynn, 1998; Virden & Walker, 1999) have come to the conclusion that time and cost constraints were the most frequent and powerful constraints on physical activity during leisure time. Crawford and Godbey (1987) identified three categories of constraints: intrapersonal constraints refer to individual psychological states and attributes; interpersonal constraints are the results of interpersonal interaction or the relationship between individuals' characteristics; and structural constraints involve intervening factors between leisure preference and participation. Crawford and Godbey's classification (1987) of the perceived constraints to physical activity during leisure time was supported by subsequent studies (Henderson *et al.*, 1995; Hultsman, 1995).

It was usually accepted that non-participation is the only outcome of the effects of leisure constraints. However, Jackson *et al.* (1993) showed that constraints might lead to modified participation rather than non-participation. Shaw *et al.* (1991) revealed that participation in a physical activity did not decrease as a result of the perceived constraints. Alexandris and Carroll (1997) reported that there was a negative relationship between the perception of constraints and sports participation. James (2000) also found the constraint and negative impact of peer ridicule when examining adolescent girls' participation in swimming. The issue of the perceived constraints in leisure studies need to continue to be expanded by using different samples. With regard to the sample in constraint studies, some researchers (Jackson, 2000; James, 2000; Rehman *et al.*, 2003) suggested that there is little empirical evidence as to the effect of negotiation on the perceived constraints by youth. One way to do this is to examine whether youth are able to continue participating in physical activity despite their perceived constraints on physical activity during leisure time.

Researchers (Iso-Ahola, 1989; Jackson *et al.*, 1993; Carroll & Alexandris, 1997) have pointed out the issue of leisure participation as a result of the relative strength of motivation between preferences and constraints. Generally, motivation has been used to explain leisure behaviour. Mannell (1980) reported that intrinsic motivation rather than extrinsic motivation is the main determinant within leisure behaviour. Similarly, Ferrer-Caja and Weiss (2000) reported that intrinsic motivation directly predicted effort and persistence in the physical education of high school students. Especially, in the study of perceived constraints on physical activity participation, the relationship between constraints and motivation has attracted attention by researchers. Since Jackson *et al.* (1993) developed "balance propositions" about the role of negotiation and motivation, efforts have been made to examine the role of motivation in the constraint negotiation process. Carroll and Alexandris (1997) investigated the relationship between constraints and motivation and reported negative relationship between them. Although a number of questions were raised by the research method, some researchers (Crawford & Godbey, 1987; Crawford *et al.*, 1991; Jackson *et al.*, 1993; Carroll & Alexandris, 1997; Jackson, 2000; Pennington-Gray *et al.*, 2002) have provided support for the relationship

between perceived constraints on participating in physical activity and strength of motivation. Other researchers (Iso-Ahola & Mannell, 1985; Stodolska, 2000; Hubbard & Mannell, 2001) also suggested that there was no empirical evidence to support the relationship between constraints and motivation. Hubbard and Mannell (2001) reported that a higher level of motivation to participate in recreation activity does not cause a reduction in the perceived constraints. The insignificant relationships between motivation and constraints in the previous studies require further research in order to clarify the role of motivation in the hierarchical model of leisure constraints.

Therefore, the purpose of this study was to examine the relationships among physical activity constraints, motivation, and physical activity level of Korean youth. The following questions were addressed: (1) Are Korean youth physically active to promote health during leisure time? (2) What constraints to physical active do youth experience during leisure time? (3) Are there relationships among constraints, motivation, and physical activity level?

METHODOLOGY

Subjects

The sample included secondary students in South Korea. A multi-staged cluster sampling technique was used to select representative areas of South Korea. South Korea contains 16 census tracts designated by Statistics of South Korea in the 2006 census profile (National Statistical Office, 2006). The representative areas were 16 states in South Korea. Authors randomly selected two secondary schools from each of the 16 states and then selected one class from each secondary school. Each class has an average of 34-40 students. Of the 1 280 questionnaires that was distributed, a total of 1 109 were returned from 538 male students and 571 female students. Their ages ranged from 13 to 19 years ($M = 15.01$, $SD=1.81$). Incomplete questionnaires ($n=171$) were dropped from this study because they were not properly completed. After being informed about the purpose of the study, an informed consent was obtained from students. The respondents were informed that participation in the study was voluntary and they were free to withdraw from the study at any time.

Instruments

Physical activity levels. Based on Korea Institute for Health and Social Affairs' recent recommendations on intensity, duration, and frequency of physical activity (2002), Cho's study (2004), and a simple leisure-time exercise questionnaire (Godin & Shephard, 1985), a self-report questionnaire was modified to measure youths' physical activity level during leisure-time. The questionnaire was modified to ensure relevance, understanding and face validity. This questionnaire consisted of a brief four-item query of usual leisure time activities. The first question is "considering the previous week, do you participate in the following kinds of active physical activity"? The physically active 24 activities provided by Secondary Physical Education Authority (2006) classified into individual activities and team activities. The second question was: "during a week, how often do you participate in the activity in your free time? The frequency of physical activity was categorized as "almost everyday", "4-5/week", "3/week", "1-2/week", and "sometimes", based on the frequency of participating in the activity in a week. A 5-point Likert-type response format was used with values ranging from 1 (sometime) to 5 (almost everyday). The third, "how intensely do you breathe when you participate in the activity"? The intensity of physical activity was categorized as "very heavy

breathing”, “heavy breathing”, “moderate breathing”, “light breathing”, and “very light breathing” based on the amount of energy or effort expended in performing the activity. A 5-point Likert-type response format was used with values ranging from 1 (very light breathing) to 5 (very heavy breathing). Finally, “how long do you do the activity in your free time”? The duration of physical activity was categorized as “almost 10 minutes”, “20 minutes”, “30 minutes”, “40 minutes”, and “more than 50 minutes”. Again, a 5-point Likert-type response format was used with values ranging from 1 (almost 10 minutes) to 5 (more than 50 minutes). A physical activity level was calculated by multiplying the score for each factor (score = intensity x duration x frequency). The physical activity levels were categorized as very active (> 125), active (64-100), acceptably active (27-48), under active (8-18), and inactive (< 8). As youth increase the intensity, duration, and frequency of physical activity, physical activity level goes up. Higher scores indicate higher levels of physical activity. The average inter-item correlation was used to measure the same construct of the items on the instrument. An average inter-item correlation for the items was 0.8692.

Constraints. The constraint questionnaire containing seven dimensions (29 items) developed by Alexandris and Carroll (1997) were used in order to collect information regarding constraints on physical activity participation. The questionnaire was translated into Korean and then translated back to English by two different bilingual experts to ensure translation correctness and comprehension. The questionnaire was also discussed with two experts in the fields of physical education and recreation to ensure relevance, understanding and face validity. The recognized experts suggested that one item (“not having a car”) out of the original 29 items from the constraint questionnaire be eliminated because it was judged to be culturally inappropriate to youth in South Korea. A pilot test was then conducted for five middle school students and five high school students to make sure respondents understood what they were being asked.

As Carroll and Alexandris (1997) reported, the constraint questionnaire was shown to have satisfactory psychometric characteristics (Cronbach Alpha 0.85 for the whole scale, all items with factor loading above 0.40, Cronbach Alpha above 0.60 on each factor). In the present study, the alpha reliability coefficient of the whole dimension was 0.94. The reliability coefficients for these dimensions were as follows: 0.74 (individual/psychological constraints consisting of six items), 0.71 (lack of partner consisting three items), 0.68 (time constraints consisting of four), 0.73 (financial accessibility constraints consisting of three items), 0.73 (facility/service constraints consisting of four items), 0.74 (lack of interest consisting of three items), and 0.84 (lack of knowledge consisting five items). Respondents were asked to evaluate the importance of each of the 28 statements as limiting or prohibiting factors for their physical activity participation, using a 5-point Likert Scale ranking from strongly agree (5) to strongly disagree (1).

Motivation. The authors used a modified version of Carroll and Alexandris’ (1997) motivation scale to ensure relevance, understanding and face validity. The motivation scale was translated into Korean and translated back into English by two bilingual professors. It was also discussed with three experts to ensure relevance, understanding, and face validity. These are (a) I regret when I am unable to participate in recreational sporting activities during leisure time, (b) Even when participation is inconvenient, I still try to participate, (c) I feel that participation in recreational sports during leisure time is important to me, (d) I am really interested in participating in sports during leisure time, and (e) I feel that spending time for recreational sports is worthwhile. Respondents were asked to comment on the above five motivations in a

4- point Likert scale ranging from always true (4) to never true (1). In the present study the reliability coefficient was $\alpha = 0.85$.

Analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS 9.0)/PC Windows computer software. Descriptive statistics were used to analyze the data collected. A two-way contingency analysis was used to test differences in the physical activity levels between boys and girls. An independent sample *t*-test was utilized to investigate differences in strength of motivation between boys and girls. A one-way MANOVA was performed to investigate differences in the perceived constraint mean scores between boys and girls. In addition, in order to investigate the relationship between motivation, constraints, and physical activity level, linear regression analyses were performed to estimate the relationship of the variables.

RESULTS

A two-way contingency table analysis was conducted to compare the levels of physical activity between boys and girls. There was a clear difference in the physical activity levels between them, $\chi^2(4, N = 1,109) = 118.357, p < 0.001$. Of the boys, 45.5% classified into inactive, whereas 72.7% of the girls were physically inactive. Percentages in the very active, active, and acceptably active levels of physical activity for boys and girls were 29.9% and 7.0%, respectively. As indicated in table 1, boys are more likely to participate in very active, active, and acceptably active levels of physical activity than girls.

TABLE 1. PHYSICAL ACTIVITY LEVELS AMONG KOREAN YOUTH

Physical activity levels	Boys Frequency (%)	Girls Frequency (%)	χ^2 (p)
Very active	18(3.3)	5(0.9)	$\chi^2 = 118.357$ $P < 0.001$
Active	70(13.0)	12(2.1)	
Acceptably active	73(13.6)	23(4.0)	
Under active	132(24.5)	116(20.3)	
Inactive	245(45.5)	415(72.7)	
Total	538	571	

Table 2 showed the results of descriptive analysis of constraints and motivation to physical activity during leisure among Korean youth. The results indicated that the highest scores of Korean boys and girls in the constraint dimensions were 2.153 (time) and 2.415 (lack of interest), respectively. In terms of the dimensions, time constraints scored higher than other dimensions in the mean score of constraint. A one way MANOVA was performed to investigate differences in the perceived constraint mean scores between the boy and girl groups. As seen in table 2, the test revealed a significant difference. The multivariate eta square index based on Wilks' Λ was large, 0.941. Analyses of variance (ANOVA) on each dependent variable were conducted. The ANOVA indicated that significant differences in lack of knowledge, psychological domain, lack of partners, lack of time, lack of accessibility, lack

of facilities, and lack of interest. Girls scored significantly higher than boys on the perceived all dimensions.

TABLE 2. RESULTS OF MANOVA AND T-TEST FOR KOREAN YOUTH ON CONSTRAINTS AND MOTIVATION

	Factors	Male Mean (SD)	Female Mean (SD)	F/t	P
Constraints	Lack of Knowledge	1.902(0.678)	2.124(0.643)	31.061	0.001
	Individual/Psychological	1.691(0.615)	1.913(0.523)	42.370	0.001
	Lack of Partners	1.940(0.708)	2.214(0.721)	40.752	0.001
	Time	2.153(0.851)	2.361(0.806)	17.055	0.001
	Financial accessibility	2.077(0.810)	2.338(0.735)	31.851	0.001
	Facilities/Services	2.061(0.908)	2.212(0.811)	8.557	0.004
	Lack of Interest	2.002(0.932)	2.415(0.955)	52.568	0.001
	Wilks'Λ=0.941, F (7, 1099) = 9.915 P<0.001, η=0.059				
Motivation		3.095(0.918)	2.793(0.795)	5.861	0.001

The mean scores of motivation were calculated using an independent-sample *t*-test. The test that calculated the mean scores of boys and girls for the strength of motivation scale was significant. As seen in table 2, boys scored significantly higher in motivation than boys. The eta square index indicated that 3.4% of the variance of the motivation accounted for by whether a youth was assigned to boy and girl.

A linear regression was conducted to evaluate the prediction of physical activity level from the overall perceived constraints on physical activity participation for youth. Two variables were linearly related such that as overall physical activity level increased the overall perceived constraints decreased. As hypothesized, youth who engaged in higher levels of physical activity tended to have lower overall perceived constraints on physical activity participation. Accuracy in predicting the overall perceived constraint was moderate. The correlation between the physical activity levels and the perceived constraints was -0.335, $t = 11.759$, $p = 0.001$ (table 3). Approximately 11% of the variance of the perceived constraints was accounted for by its linear relationship with the physical activity level.

A linear regression was performed to evaluate the prediction of motivation from the overall perceived constraints on physical activity participation for youth, Motivation variable and constraint variable were linearly related such that as overall motivation index increased the overall perceived constraints decreased. As hypothesized, youth who engaged in higher motivation tended to have lower overall perceived constraints on physical activity participation. Accuracy in predicting the overall strength of motivation was small. The correlation between the motivation index and the perceived constraints was -0.284, $t = 9.797$, $p = 0.001$ (table 3). Approximately 8% of the variance of the motivation index was accounted

for by its linear relationship with the perceived constraints.

A linear regression was performed to evaluate the prediction of physical activity level from the overall motivation index for youth. Motivation and physical activity level were linearly related such that as overall motivation increased as the physical activity level increased. As hypothesized, youth who engaged in higher physical activity level tended to have higher motivation index on physical activity participation. Accuracy in predicting the physical activity level was small. The correlation between the physical activity level and the motivation index was 0.258, $t = 8.838$, $p = 0.001$ (table 3). Approximately 7% of the variance of the physical activity level was accounted for by its linear relationship with the strength of motivation.

TABLE 3. THE RESULTS OF THE LINER REGRESSION ANALYSIS FOR THE PERCEIVED CONSTRAINTS, MOTIVATION, AND PHYSICAL ACTIVITY LEVELS

	Unstandardized Coefficients		Unstandardized Coefficients	t	Sig.	R	R ²
	B	Std. Error	Beta				
(Constant)	2.706	0.052		52.331	0.000		
PAL	-0.218	0.019	-0.335	-11.759	0.000	0.335	0.112
(Constant)	3.798	0.091		41.691	0.000		
Constraints	-0.402	0.041	-0.284	-9.797	0.000	0.284	0.081
(Constant)	2.316	0.075		30.856	0.000		
Motivation	2.38	0.027	0.258	8.838	0.000	0.258	0.067

Note: PAL indicates physical activity levels.

DISCUSSION

The percentages of Korean boys and girls who were considered to be very active, active, and acceptably active levels for health benefits were 23.9% and 7.0%, respectively. The proportions of boys and girls who were considered to participate in under active and inactive levels were 70% and 93%, respectively. A large number of Korean youth did not spend time on a sufficient level of physical activity to gain health benefits during leisure time. This result implied that most of Korean youth did not meet the recommendation that youth should participate in physical activity for at least 30 minutes at moderate intensity on three day of the week. Differences in the levels of physical activity between boys and girls were observed. These results support results of previous studies that boys are significantly more active than girls (Cho, 2004; Manios *et al.*, 1999). This result may be explained by the fact that stereotype and attitude toward physical activity during leisure time influence girls' habits and discourage them from participating in physical activity during leisure time.

The second research question was to determine what constraints to physically active youth experience during leisure time. The present study showed that the most prevalent constraints on physical activity participation during leisure time experienced by both boys and girls were lack of time and financial accessibility. Although Alexandris and Carroll (1997) reported that

intrapersonal constraints (individual/psychological, lack of interest, lack of knowledge) might be the most influential constraints, this study revealed that the time, interest, and financial accessibility dimensions were the most influential constraints experienced by both Korean boys and girls. In addition, this study showed the differences in the perceived constraints on physical activity participation between boys and girls. It was demonstrated that girls scored significantly higher than boys on the perceived all constraint dimensions. These results supported Rehman's *et al.* (2003) and Cho's (2004) studies, which support the gender differences in the perceived constraints on physical activity participation. One possible explanation for this result seems to lie in the results of Cho's study (2004) that Korean youth are required to compete for time studying in or out of school. In Korean society, academic achievement was highly emphasized. Hence, Korean youths are encouraged to spend time studying Mathematics and English rather than participating in physical activities or sport. This is especially true among youth whose perceived constraints on the physical activity participation have eroded due to the certain factors and circumstances such as times and finances.

The third research question was to investigate the relationships among constraints, motivation, and physical activity level of Korean youth. This research supports and extends findings reported previously (Alexandris & Carroll, 1997; Carroll & Alexandris, 1997; Jackson, 2000). The earlier analysis found that there was a negative and significant relationship between perceived constraints and recreational sport participation. Contrary to Kay and Jackson's (1991) and Shaw's *et al.* (1991) studies that rejected significant differences between perceived constraint and sport participation, the present analysis finds that the perceived constraints are statistically negatively related to physical activity levels during leisure time. The issue regarding the relationship between the perceived constraints and leisure participation attracted significant attention by the researcher. Kay and Jackson (1991) found that high levels of constraints were reported by both participants and non-participants. Also, Shaw *et al.* (1991) reported non-significance between leisure constraints and exercise participation. However, Alexandris and Carroll (1997) provided evidence for the negative relationship between the perceived constraints and sports participation. In the study of the perceived constraints to physical activity among high school students, Allison *et al.* (1999) reported that perceived barriers may be predictive of physical activity participation among high school students only under specific conditions. The findings of this study revealed that there was a negative and significant relationship between the perceived constraints on physical activity during leisure time and physical activity levels. It implied that youth who engage in higher levels of physical activity during leisure time tended to have lower overall perceived constraints on physical activity participation.

Based on the previous study's findings that constraints do not always prevent recreational sports participation or physical activity (Scott, 1991; Shaw *et al.*, 1991), Jackson *et al.*, (1993) developed "balance" propositions about the role of negotiation and motivational processes. It is known that the "the balance" proposition that both the initiation and outcome of the negotiation process are dependent on the relative strength of constraints on participation in an activity and motivations for the participation. The relationship between motivation and perception of constraints can be explained by a linear regression analysis. The present study showed that the strength of motivation for participation in physical activity during leisure time is statistically negatively related to the perception of constraints as a whole. Iso-Ahola (1999) showed that motivation is associated with a variety of positive behavioural consequences such as increased frequency and level of sports participation. Although past researchers (Ellis &

Witt, 1984; Iso-Ahola & Mannell, 1985) suggested that constraints might influence motivation, both Stodolska (2000) and Hubbard and Mannell (2001) reported that constraints must be perceived both as barriers and as potential motivators for sports. But, the results of this study supported the previous studies (Carroll & Alexandris, 1997; Pennington-Gray *et al.*, 2002) that the strength of motivation was found to be negative related to the perception of constraints, supporting the “balance” proposition. The result of this study implies that youth who are the least motivated are the most constrained. In other word, youth who perceive the lowest level of constraints have the highest level of motivation for physical activity. These findings can be explained by the fact that youth who perceived more constraints were shown to have the strongest negative relationships with the strength of motivation.

In particular, the linear regression analysis revealed positive and significant relationships between motivation and physical activity levels. Iso-Ahola (1999) showed the power of intrinsic motivation in leisure behaviours and the positive influence of intrinsic motivation on the frequency of participation. The results of the present study support the previous study (Hubbard & Mannell, 2001) and provide evidence for the positive relationship between motivation and physical activity level. Weissinger and Bandalos (1995) conducted a study dealing with the power of intrinsic motivation in leisure settings. They reported the positive strength of intrinsic motivation on the frequency of participation. Motivation was assumed to be the primary internal psychological factor motivating youth to participate in physical activity during leisure time, and consequently, leading to a high level of physical activity during their leisure time. The present study revealed that the physically active group showed a greater increase in the strength of motivation for participation in physical activity. The result of this study implies that more highly motivated youth are more likely to participate in active physical activity than those who are less motivated, and more highly motivated youths are less perceived constraint to participation in high level of physical activity. The findings of this study might be explained by the strength of motivation as an important factor in dealing with constraints and participating more frequently and vigorously in physical activity during leisure time for youth.

In conclusion, this study confirms the results of previous studies (Carroll & Alexandris, 1997; James, 2000; Pennington-Gray & Kerstetter, 2002) and has provided empirical support for the “balance” theory (Jackson *et al.*, 1993). Vigorously active participation in physical activity during leisure time for Korean youth was found to be negatively correlated with higher levels of constraint and positively correlated with higher levels of motivation. Also, this study revealed the negative correlation between motivation and constraint. The findings of this study might be explained by the strength of motivation as important factor in dealing with constraints and participating more vigorously in physical activity during leisure time for Korean youth.

Though there is empirical support for the relationships among constraints, motivation, and physical activity levels, few attempts have examined the relationships in other populations and with more powerful analysis. Future research is needed to empirically examine various populations with different statistical methods to determine the generalizability of the study. Furthermore, there is some evidence that motivation may be an important factor in the leisure constraint negotiation process. Therefore, future studies are required to investigate the process by which constraints, motivation, and negotiation influence leisure participation.

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