

## Original Article

### Sport commitment profiles of adolescent athletes: Relation between health and psychological behaviour

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#### Abstract:

*Introduction* Physical activity is one of the key for healthy lifestyle. Many motivational theories tried to understand reasons behind adolescent sport participation; therefore, the purpose of this study was to investigate, among adolescent athletes, sport commitment cluster profiles and to examine profile differences in health and psychological variables. *Methods* Participants were 526 adolescent athletes (M=16.41; SD=1.16) who completed questionnaires of sport commitment, well-being, future orientation, health attitude, and aspirations. Sport Commitment profiles were created by cluster analysis using commitment determinants and MANOVA and ANOVA were used for further analysis. *Results* The first cluster, labelled as obligatory athletes, showed a profile of obligation dominating sport participation, whereas commitment was not prominent. The second cluster, noncommitted athletes, was characterized by the perception of sport as a negative experience. The third cluster of athletes was labelled enthusiastic athletes who expressed sport as a positive experience. ANOVA analysis examining the group differences on health and psychological variables showed that enthusiastic athletes scored higher on well-being, future goals, and intrinsic aspirations. Obligatory athletes scored significantly higher on extrinsic aspirations and health. *Conclusion* The cluster analysis showed diverse sport commitment profiles. As it was expected results revealed that Enthusiastic athletes had significantly higher scores on most of the psychological scales. Positive experience of physical activity and sport may have a significant role in life satisfaction and affect the short- and long-term future goals. Our results suggest that athletes who participate in sport only for obligatory reasons are more likely to have extrinsic aspirations. As the age increases, the motivation to sport decreases. More investigations are needed to understand the psychological background of sport motivation, but we believe that our study provides useful information for better understanding of young athletes' sports participation.

**Keywords:** Sport Commitment, Cluster analysis, Health attitude, Psychological Behaviour

#### Introduction

Important motives for physical activity among adolescents include having fun, providing new experiences, challenging oneself, and being with friends and family (e.g., Kalpatrick, Herbert & Bartholomew, 2005). Over past decades, various sport motivation concepts have been utilized to gain better understanding of adolescent motivations for physical activity (i.e., Goal Orientation Theory by Locke & Latham, 1985). The concepts of commitment may also add to greater understanding of young athletes' motives behind physical activity participation. While there have been many studies involving sport commitment (i.e., Weiss, Weiss & Amorose, 2010), there are only a few studies that focus on health and psychological behaviours as correlates of sport commitment, despite potential impact of sports commitment on athletes' social influences (Weiss & Weiss, 2003), burnout (Raedeke, 1997), and exercise behaviour (e.g., frequency of the exercise) (Wilson et al., 2004).

The Sport Commitment Model (Scanlan, Carpenter, Simons, Schmidt & Keeler, 1993) is important to consider because it may contribute to a more comprehensive understanding of sport participation or dropout. Within this model, sport commitment is defined as a "psychological construct representing the desire and resolve to continue sport participation" (Scanlan, Chow, Sousa, Scanlan, & Knifsend, 2016, p. 235). The original Sport Commitment Model consisted of five determinants of commitment (enjoyment, investments, opportunities, alternatives, social constraints). However, recent research has uncovered possible new sources of commitment (Scanlan, Russell, Beals, & Scanlan, 2003; Scanlan, Russell, Magyar & Scanlan, 2009; Gabriele, Gill, & Adams, 2011). In these studies, the Sport Commitment Model was further tested with quantitative methods using the Scanlan Collaborative Interview Method (Scanlan et al., 2003). At first, they verified the existent determinants by using quantitative methods. Enjoyment, investments and opportunities found to be the positive predictors of

the Sport Commitment Model and Social Constraints and alternatives (it was renamed as Other Priorities) found as negative influences on commitment (Scanlan et al., 2003). Following the interview method different possible new determinants were tested (e.g., Team Tradition, Team Membership, Social Support, Desire to Excel; Scanlan, Russell, Scanlan, Klunchoo, & Chow, 2013). However, only Social Support and Desire to excel were added to the final model. There was another approach to commitment studies. Gabriele and her colleagues (2011) argued that an athlete could be committed in an obligatory way. Therefore, they tested "want to" and "have to" commitment in their study. As a result of these studies, Scanlan and colleagues (2016) reviewed and expanded the original model with two types of commitments (enthusiastic and constrained), and described 7 possible sources of commitments (Sport Enjoyment, Personal Investments, Valuable Opportunities, Social Support, Social Constraints, Other Priorities, Desire to Excel). This expansion of the Sport Commitment Model required a new version of the scales to measure these constructs. As a result, the original sport commitment questionnaire was updated and expanded to measure the two types of commitment and the ten possible determinants. The new scale measures two types of Social Support, Personal Investments, and Desire to Excel.

Research shows that Sport Enjoyment, Opportunities Social Support, and Desire to Excel are the strongest positive sources of Enthusiastic Commitment (Carpenter et al., 1993; Scanlan et al., 1993, 2013, 2016). Personal Investments, Social Constraints and Other Priorities were found as the strongest predictors of constrained types of commitment (Scanlan et al., 2016). Some of these predictors found to be associated with both types of commitment. For example, Sport Enjoyment, Valuable Opportunities had positive relationship with Enthusiastic and negative relationship with Constrained types of commitment.

Since the Sport Commitment Model encompasses different types and sources of motives, it may be a useful tool for clustering athletes based on these types and sources, and thus determine athletes' profiles. Raedeke (1997) and Weiss and Weiss (2003) provide empirical support for sport commitment profiles based on the theoretical work argued by Schmidt and Stein (1991) and the early Sport Commitment Model (Scanlan et al., 1993). This research used cluster analysis applying the determinants of commitment to identify commitment profiles. Using the same methodology, Raedeke (1997) predicted athletes' profiles with more commitment determinants. However, Weiss and Weiss (2004) agreed that attracted athletes (named as enthusiastic athletes in Raedeke's work) were characterized by high levels of enjoyment, opportunities and investments, and fewer alternatives and social constraints. In turn, the entrapped athletes (malcontented swimmers in Raedeke's study) were motivated more by obligation to their participation and showed lower levels of enjoyment, opportunities, and higher alternatives and social constraints. There were also differences in terms of investments. Raedeke (1997) reported low level of investments among swimmers, while Weiss and Weiss (2003) found high level of investments among gymnasts in an entrapment profile. Both studies described athletes' profiles who reported feeling between entrapped and attracted profiles. They argued that these athletes might be in a transition period and they were experiencing both positive and negative aspects of their sports (Weiss & Weiss, 2003). In addition, Raedeke (1997) found a fourth type of profile. He named them indifferent swimmers and these athletes consisted of those who lacked commitment, were unmotivated for sport participation, and reported low levels of sources of sport commitment.

As a result of these studies carried out by Raedeke (1997) and Weiss and Weiss (2003) other determinants were explored and added to the Sport Commitment Model (Scanlan et al., 2016). Thus, cluster analysis seemed an appropriate tool for detecting athletes' motivational profiles. Therefore, we applied the widely used Sport Commitment Model which allowed us to determine similar profiles in a sample of Hungarian adolescent athletes. In addition to defining commitment clusters, we also aimed to investigate how these profiles would differ along with certain health and psychological behaviours.

We included health and psychological variables in this study because we firmly believe that they are related to sport commitment. Namely, a commitment to physical activity is necessary for personal health from which youth can benefit in the long term (Williams, 2013). Adolescents who exercises regularly tend to report better health status (Silva, Lott, Mota, & Welk, 2014), psychological well-being (Reinboth, & Duda, 2006), and improved quality of life (Jirojanakul, Skevington, & Hudson, 2003). Health consequences and the beneficial role of sport in prevention can be experienced in the long term. Therefore, it is not surprising that there is clear evidence that a stronger consideration of future behaviour is associated with health lifestyle practices such as physical exercise (e.g., Oullette, Hessling, Gibbons, Reis-Bergan & Gerrard, 2005) as well. Furthermore, when considering the long term, values can be a factor that interacts with both sport commitment and health consciousness. For example, Píko and Keresztes (2006) found that regularly active adolescents prefer less extrinsic values (e.g., fame, financial success) in their life goal aspirations than less active students. The positive motivational climate in sport is found to be an important source of both psychological and health behaviour, and is accordance with the findings of Gunnell and her colleagues (2014) that self-determined motivation could lead to increased psychological health. In another study, Cronin & Allen (2015) found that the positive motivational climate created by coaches was related to psychological well-being such as satisfaction with life. All in all, based on the link between health and psychological variables and the motivational climate, we decided to further analyse youth's commitment profiles along with variables, such as life aspirations, future orientation, satisfaction with life, or health attitudes. This is a particular aspect of sport commitment that has not yet been explored.

Very few sport commitment studies have included athletes' health attitudes and different psychological

behaviours. Research typically has explored physical activity correlates with a diverse range of psychological behaviours (i.e., Maher, Doerksen, Elavsky & Conry, 2014), but only a few studies have investigated these correlates in relation to sport commitment. It is well known that regular physical activity can improve subjective well-being (Elavsky & MacAuley, 2005), which is commonly referred to "happiness" (Ben-Zur, 2003). The happy adolescent has fewer problems with depression, anxiety and violent behaviours (Gilman & Huebner, 2003; Valois, Zullig & Huebner, 2001). Other studies show that well-being is dependent on age and active lifestyle. Stone and colleagues (2010) found increasing age to be associated with decreasing subjective well-being in terms of sport participation. Future goals are particularly important given the association with psychological well-being and the fact that goals may influence such aspects of life as education, work and family (Kasser & Achevia, 2002; Gurková, Haroková, Džuka & Žiaková, 2013). Studies show that individuals with higher extrinsic future goals such as those prioritizing financial success exhibited a lower level of mental well-being compared to those who reported higher intrinsic goals (i.e., help the community) (Sheldon, Ryan, Deci & Kasser, 2004; Lee, McInerney, Liem & Ortiga, 2010). Unfortunately, there are very few studies about athletes' future aspirations, despite the fact that individuals who are strongly motivated to succeed in their sport are generally future-oriented and they are carrying out plans related to their future fulfilment (Halvari & Thomassen, 1997). Thus, regular physical activity has many benefits for physical and mental health (Butt, Weinberg, Breckon & Claytor, 2011). Thus, life goals also have several health benefits and mental well-being implications and should be included in studies of motivations of adolescent physical activity (Kasser & Achevia, 2002).

The research literature is characterized by studies that have concentrated on the mental and physical health benefits of physical activity, but these studies have not included health and future oriented attitudes in relation to athletes' sport commitment. As a result, we hypothesize that athletes' sport commitment types may be associated with their future life goals and health attitudes. Based on a preliminary mapping of descriptive statistics and bivariate relationships between sources of sport commitment and athletes' health and psychological behaviours, there are two purposes of this study: 1) an exploration using cluster analysis of young athletes' profiles based on the determinants of the expanded Sport Commitment Model (Scanlan et al., 2016); and 2) an investigation of how these clusters differ in terms of certain psychological behaviours such as short-term future goals, aspirations, life satisfaction and health attitudes. Based on the current literature, we hypothesized the following: 1) Three commitment profiles can be distinguished (including highly committed, obligatory, and low committed athletes). 2) Highly committed athletes perceive higher levels of enjoyment, investments, opportunities, achievements, social support, and lower level of social constraints and alternatives. 3) Obligatory athletes have higher levels of investments, alternatives, and social constraints. 4) Low committed athletes perceive low levels of most of the commitment determinants except alternatives. 5) In relation to group differences, we hypothesized that mean values for well-being, future goals and intrinsic aspirations will be significantly higher for highly committed athletes than obligatory and low committed athletes. 6) Obligatory athletes are expected to have higher levels of extrinsic aspirations and health attitudes than highly and lowly committed profiles.

## Material & methods

### *Participants*

Participants in the study were 526 adolescent athletes (275 males and 251 females) with ages ranging from 14 to 18 years ( $M = 16.5$ ;  $SD = 1.3$ ). They participated in sports for an average of 8.25 years ( $S.D. = 3.5$ ) and represented 38 different sports. Nearly half (49.2%) of the athletes were participants in individual sports and 50.8% were participants of team sports. In terms of competition, 39.7% of sample members consisted of athletes competing at the international level.

### *Measures*

Social and demographic data were provided by the athletes on their age, gender, educational background, family status and characteristics of their sport activity (i.e., "How long have you been doing this sport?").

Sport Commitment was measured by the Hungarian version of the Sport Commitment Questionnaire-2 (Scanlan et al., 2016). The scale was translated and adapted in a previous study (Berki, Pikó & Page, 2020). The questionnaire contained 52 items and 12 subscale with response options on a five-point Likert-type scale ranging from 1 (Strongly disagree) to 5 (Strongly agree). The questionnaire consists of the two types of commitment and the ten possible sources of sport commitment. Enthusiastic Commitment (EC) represents the desire to continue sport participation. Constrained Commitment (CC) represents the obligation to continue sport participation. The ten possible sources of commitment are: Sport Enjoyment (SE) representing the joy and happiness in sport activity; Other Priorities (OP) which includes alternatives of sport activity; Valuable Opportunities (VO) which includes the opportunities that may stem only from sports; Social Constraints (SC) are the social expectation and norms; Personal Investment-Quantity (PI-Q) means the amount of resources that an athlete puts into sport; Personal Investment-Loss (PI-L) represents the loss of investments that cannot be recovered when the participation is discontinued; Social Support-Emotional (SS-E) represents encouragements from others; Social Support-Informal (SS-I) provides useful information from others; Desire to Excel-Mastery (DE-M) means

striving to improve and achieve; and Desire to Excel-Social (DE-S) means winning and establishing superiority over others. The Cronbach alpha coefficient values varied between .71 and .92 in the original measures, and between .66 (Constrained Commitment – the lowest) and .91 (Enthusiastic Commitment – the highest) in our study.

Life satisfaction was measured using the Hungarian version of the Satisfaction with Life Scale (SWL; Diener, Emmons, Larsen, & Griffin, 1985; Martos, Sallay, Désfalvy, Szabó, & Ittzés, 2014). The scale includes 5 items and the responses ranging from 0 (strongly disagree) to 7 (strongly agree). The questionnaire is a unidimensional scale and measures general satisfaction with life, with statements such as "I am satisfied with my life." It is a widely used scale with a high level of validity and reliability. The Cronbach alpha coefficient in the adaptational study was .86, similar to our study. Future orientation was measured by the Hungarian version of the Consideration of Future Consequences Scale - Short version (CFC; Strathman, Gleicher, Boninger, & Edwards, 1994; Pikó, Luszczynska, Gibbons & Teközel, 2005). The scale assesses individual differences in the construct of future thought. It includes six items with statements such as "I consider how things might be in the future and try to influence those things with my day to day behaviour." The response categories were in a 5-point Likert-type scale, ranging from 1 (extremely uncharacteristic) to 5 (extremely characteristic). The Cronbach alpha value of reliability was relatively low (.58), similar to a previous study (Pikó et al., 2005).

The Aspiration Index (AI; Kasser & Ryan, 1996) was employed to assess the students' future life goals. The scale contains 14-items (shortened version) and was adapted by Martos and colleagues (2006) in which each goal contained two statements (altogether seven). The scales (both the original and the shorter one) measures extrinsic (fame, richness, appearance) and intrinsic (social relationships, personal development, social engagement) long-term life goals (Kasser & Ryan, 1996; V. Komlósi, Rózsa, Berdi, Móricz, & Horváth, 2006). The response categories are on a 5-point Likert scale ranging from 1 (not important) to 5 (very important). The Cronbach alpha coefficients showed similar values with the original studies: .81 for extrinsic aspiration and .75 for intrinsic aspiration, whereas in the original study they varied between .75 and .79 (Martos et al., 2006).

The Health Attitudes (HA) Index includes questions related to appearance, and physical and psychological condition (i.e., "I'm doing sports to lose some weights"). The index was used to measure body related motivation, which could be a strong personal value (Frederick & Ryan, 1993). The scale was translated and modified from Frederick & Ryan's (1993) Motivation for Physical Activity Measure, body-related subscale. The unidimensional scale included 8 items and the response categories of the scale were on a 5-point Likert-type scale, ranging from 1 (not agree at all) to 5 (totally agree) and showed a good reliability with a Cronbach alpha value of .84.

#### *Procedure*

Approval for this study was sought and obtained from the university's Institutional Review Board. Subsequently, permission to complete the survey was sought from 12 different sport schools in Budapest. Six of these schools agreed to participate in this research project, and the study was authorized by the school principals. Parents and students were informed by school teachers in mails about the goals of the research and their consent was obtained. The questionnaires were administered by Physical Educators in PE classes and it took approximately 15-20 minutes for students to fill out the survey form. Questionnaires were self-administered, anonymous and voluntary, and personal data such as names were not collected from the participants. The adolescents were assured by the Physical Educators that the survey items did not include questions with right or wrong answers.

#### *Statistical analysis*

After data collection, SPSS for Windows 22.0 software was used for data analysis. Besides descriptive statistics (i.e., means, standard deviations) and bivariate correlations, K-Means cluster analysis was conducted to identify commitment profiles according to the 10 sources of sport commitment. K-Means cluster is a commonly used method to specify the number of clusters. First, hierarchical cluster analysis was used to check for outliers and to help determine what would be the optimal number of clusters (based on the agglomeration schedule and dendogram). Then we conducted K-means cluster analysis for categorization of the students since our sample size was suitable to this method (Hair, Black, Babin & Anderson, 2009). Since the previous studies suggested that there would be 3 eligible clusters (Raedeke, 1997; Weiss & Weiss, 2003), we hypothesized this direction. The number of clusters was then confirmed by ANOVA tests. This cluster method has a distance-based clustering algorithm, in which the distance is used as a measure of similarity. To examine the emerged motivational profiles, a series of multivariate and univariate analysis were conducted. First, to validate our cluster group result a one-way ANOVA with Tukey's post-hoc test was conducted using enthusiastic commitment and constraint commitment as the dependent variable. Then, one-way MANCOVA was conducted using the profile group as the independent variable, psychological scales (i.e., SWL, CFC, Aspirations, Health Attitude) as dependent variables and sociodemographic data (gender, age, sporting level, time spent in sport) as covariates. After controlling for the sociodemographic background MANOVA was conducted for further analysis. Significant multivariate results were followed by ANOVA with Tukey's post-hoc analysis. The significant level of acceptance was 0.05.

**Results**

*Descriptive statistics and bivariate relationships*

Table 1 displays means, standard deviations, ranges, bivariate correlations and alpha reliabilities (along with the diagonal) for the commitment sources and the psychological scales. The participants of this study reported moderate level of Personal Investment-Loss, Other Priorities, Social Constraints, Social Support- Informal, Consideration of Future Consequences, Extrinsic Aspiration and Health Attitude; and high level of Sport Enjoyment, Valuable Opportunities, Personal Investment-Quantity, Desire to Excel-Mastery, Desire to Excel-Social, Social Support-Emotional, Satisfaction with Life and Intrinsic Aspirations.

Table 1. Correlations, alpha coefficients and descriptive statistics for study variables

	SE	VO	PI-Q	PI-L	OP	DE-M	DE-S	SC	SS-E	SS-I	SWL	CFC	AI-I	AI-E	HA
SE	(.85)														
VO	.35**	(.80)													
PI_Q	.34**	.72**	(.86)												
PI-L	.18**	.55**	.55**	(.82)											
OP	.18**	-.10*	-.10*	.05	(.77)										
DE-M	.54**	.64**	.71**	.47**	.17**	(.87)									
DE-S	.35**	.68**	.72**	.47**	-.07	.70**	(.81)								
SC	.03	.50**	.46**	.51**	.12**	.28**	.40**	(.76)							
SS-E	.28**	.51**	.50**	.30**	.16**	.49**	.51**	.34**	(.78)						
SS-I	.31**	.56**	.58**	.38**	-.03	.56**	.52**	.48**	.61**	(.77)					
SWL	.28**	.22**	.17**	.10*	.27**	.22**	.21**	.12**	.36**	.36**	(.86)				
CFC	.23**	.26**	.22**	.14**	-.11*	.32**	.25**	.05	.17**	.24**	.20**	(.58)			
AI-I	.17**	.15**	.09*	.09*	.12**	.23**	.14*	.05	.25**	.24**	.42**	.22**	(.75)		
AI-E	-.08	.23**	.21**	.28**	.16**	.18**	.32**	.26**	.24**	.27**	.34**	.08	.34**	(.81)	
HA	-.01	-.02	-.06	.14**	.19**	-.02	-.07	.10*	-.01	.06	-.05	-.05	.10*	.25**	(.84)
Range	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-7	1-5	1-5	1-5	1-5
M	4.51	3.94	4.30	3.58	2.55	4.33	4.09	3.24	3.94	3.60	5.20	3.65	4.36	3.85	3.36
SD	.66	1.03	.86	1.05	.918	.74	.84	1.08	.94	.92	1.28	.63	.47	.78	.90

Note. SE= Sport Enjoyment; VO=Valuable Opportunities; PI-Q=Personal Investment-Quantity; PI-L=Personal Investment-Loss; OP=Other Priorities; DE-M=Desire to Excel-Mastery; DE-S=Desire to Excel-Social; SC=Social Constraints; SS-E=Social Support-Emotional; SS-I=Social Support-Informal; SWL=Satisfaction with Life; CFC= Consideration of Future Consequences; AI-I= Intrinsic Aspirations; AI-E Extrinsic Aspirations; HA= Health Attitude; Alpha values on the diagonal, correlation values below diagonal.  
\*p<0,05 \*\*p<0,01

Alpha coefficients for the commitment sources varied between .76 and .85; for the psychological scales they ranged from .58 to .86. Only the Consideration of Future Consequences scale had relatively low reliability. However, previous cross-cultural studies showed valuable application of the scale (Pikó, Luszczynska, Gibbons & Teközel, 2005).

The pattern of the bivariate correlations of the commitment sources was in a theoretically consistent direction (Scanlan et al., 2016). As we expected, Other Priorities had significant and negative relations with most of the sport commitment sources and Sport Enjoyment had significant and positive relations among these subscales. The connections of Satisfaction with Life, Consideration of Future Consequences, and Intrinsic Aspiration resulted positive correlations in most of the scales, except for Other Priorities where a negative significant result was found. There was no significant connection between Social Constraints, Consideration of Future Consequences and Intrinsic Aspirations. With the exception of Sport Enjoyment, Extrinsic Aspirations had positive significant correlations with all of the scales. Health Attitude had very few correlations: only Personal Investment, Other Priorities and Social Constrained showed significant associations.

*Cluster analysis*

Cluster analysis was used to determine commitment profiles using the sources of sport commitment. K-means cluster was performed using both standardized z-scores and raw scores to help interpret a better result. Consistent with previous studies (Raedeke, 1997; Weiss & Weiss, 2003) three cluster groups emerged with the ten subscales of commitment. Table 2 shows the means, standard deviations, and z-values of the three cluster groups and Figure 1 presents the three cluster groups based on their z-scores. The z-value of .5 was used as the criterion to identify whether the athletes scored relatively higher or lower levels on each variable compared to athletes in the other groups. The z-scores show the standardized average scores, which help us interpret our findings. If the values are between 3 and -3 they could be considered as normally distributed data.

Table 2. Means, z-scores, SD and F-test for the cluster groups

	Cluster 1 Obligatory (n=162)			Cluster 2 Noncommitted (n=65)			Cluster 3 Enthusiastic (n=299)			F - Test
	Mean	SD	Z-Score	Mean	SD	Z-Score	Mean	SD	Z-Score	
Sport Enjoyment	4.24	.75	-0.42	3.95	.91	-0.86	4.79	.33	0.41	83.65***
Valuable Opportunities	3.55	.79	-0.38	2.15	.80	-1.74	4.54	.51	0.58	407.60***
Personal Investment-Quantity	4.05	.60	-0.29	2.72	.93	-1.84	4.78	.34	0.56	434.082***
Personal Investment-Loss	3.53	.68	-0.05	2.11	.92	-1.40	3.93	.97	0.33	114.96***
Other Priorities	2.94	.93	0.42	2.51	1.00	-0.05	2.36	.83	-0.22	23.16***
Desire to Excel-Mastery	4.01	.54	-0.43	3.11	.87	-1.64	4.78	.29	0.59	372.73***
Desire to Excel-Social	3.81	.58	-0.33	2.58	.85	-1.78	4.58	.40	0.57	406.57***
Social Constraints	3.24	.94	-0.01	1.85	.85	-1.28	3.55	.97	0.28	87.70***
Social Support-Emotional	3.53	.90	-0.43	2.79	.92	-1.22	4.42	.60	0.50	162.86***
Social Support-Informal	3.31	.75	-0.32	2.25	.78	-1.47	4.06	.63	0.50	205.56***

\*\*\*p<0.001

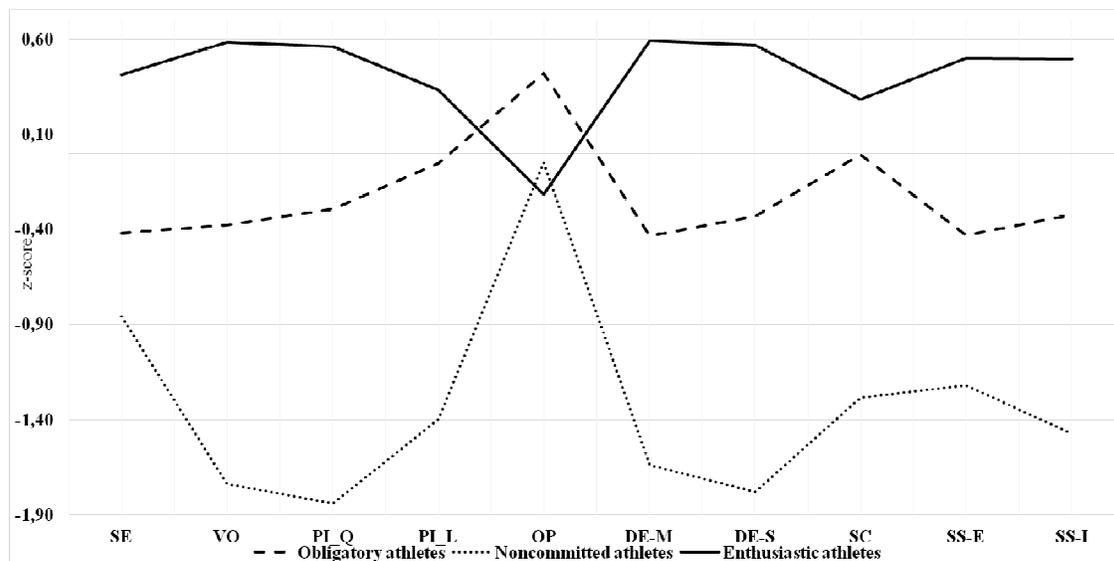


Figure 1. The Cluster group profiles based on z-scores for the 10 commitment sources

Note. SE= Sport Enjoyment; VO=Valuable Opportunities; PI-Q=Personal Investment-Quantity; PI-L=Personal Investment-Loss; OP=Other Priorities; DE-M=Desire to Excel-Mastery; DE-S=Desire to Excel-Social; SC=Social Constraints; SS-E=Social Support-Emotional; SS-I=Social Support-Informal;

The first cluster was labelled as obligatory athletes (n=162; 30,7%). These athletes scored moderate level on each scale with the exceptions of Other Priorities where they scored the highest compared to the other groups (see Table 2; Figure 1). When examining the results, it can be seen that seven out of the ten variables had lower means than the averages of the sample. Other Priorities showed higher than the average of the sample, and Personal Investment-Loss, and Social Constraints showed average scores with increased z-scores. Thus, it appears that within this cluster that commitment is not prominent, and obligation dominates participation.

We labelled the second cluster as noncommitted athletes (n=65; 12,3%). These athletes perceived sport as a negative experience. As seen in Table 2 and Figure 1, they had the lowest values on each scale (except Other Priorities) compared to the other groups. In comparison with the averages of the samples, the mean values are below the averages in this group. In conclusion, a general noncommitment is the main feature.

The third cluster was labelled as enthusiastic athletes (n=299; 57,0%). They perceived sport as a positive experience. These athletes reported the highest values (except Other Priorities) on each scale compared to the other profiles. With the exception of Other Priorities all scales showed higher results than the average of the sample. Social Constraints scored moderately lower compared to the other variables in this profile. These athletes are committed to sport participation. To confirm validation of our results, we compared the three emerged cluster groups on Enthusiastic and Constraint Commitments. The ANOVA showed significant results for Enthusiastic Commitment ( $F(2,523)=252.64$ ;  $p < .001$ .) Tukey's post-hoc test revealed that Enthusiastic athletes have significantly higher value ( $p < .05$ ) for athletes with Enthusiastic Sport Commitment than

obligatory and noncommitted profiles. The ANOVA result of Constrained Commitment was significant as well ( $F(2,523)=52.210$ ;  $p < .001$ ) and the post-hoc analysis found that noncommitted athletes had a significantly higher value ( $p < .05$ ) for the Constrained Commitment than Enthusiastic and Obligatory athletes. These results support our hypothesis that these three cluster groups are distinct groups based on the determinants of sport commitment.

*Group difference analysis*

A multivariate analysis of covariance (MANCOVA) was conducted to investigate the impact of sociodemographic data (gender, age, sporting level, time spent in sport) on the psychological scales (SWL, CFCS, Intrinsic and Extrinsic Aspiration Index, Health Attitude) between sport commitment profiles. The multivariate tests did not indicate significant differences between the sport commitment profiles in the combined dependent variables while controlling for age (Pillai's trace = .21,  $F(10,1012)=1.06$ ,  $p=.38$ ,  $\eta^2=.10$ ); gender (Pillai's trace = .33,  $F(10,1012)=1.68$ ,  $p=.08$ ,  $\eta^2=.16$ ); sporting level (Pillai's trace = .32,  $F(10,1012)=1.37$ ,  $p=.09$ ,  $\eta^2=.19$ ); and time spent in sport (Pillai's trace = .15,  $F(10,1012)=.75$ ,  $p=.66$ ,  $\eta^2=.07$ ).

Since the role of sociodemographic was not significant in the profiles and psychological scales, one-way MANOVA was conducted to see whether the cluster groups differed in their psychological profiles without covariates. In this analysis, the three cluster groups were the independent variables and five psychological scales (SWL, CFCS, Intrinsic and Extrinsic Aspiration Index, Health Attitude) were the dependent variables. The MANOVA yielded a significant multivariate effect, Pillai's trace = .24,  $F(10,1040)=14.87$ ,  $p<.01$ ,  $\eta^2=.12$  and the follow-up univariate analysis indicated significant differences in all variables with the effect size ranging from 2% to 11% of the variance explained and represents from small to large effects, respectively (Cohen, 1992; see Table 3). Tukey's Post-Hoc test showed that scores of Satisfaction with Life, Consideration of Future Consistencies and Intrinsic Aspirations scales were significantly higher ( $p < .05$ ) for enthusiastic athletes than for obligatory and noncommitted athletes. Obligatory athletes reported significantly higher values ( $p < .05$ ) for Extrinsic Aspirations and Health Attitude compared to the other profiles.

Table 3. Univariate F, effect size, cluster means, SD, and standardized scores for psychological variables

Variable	F (2, 523)	$\eta_p^2$	Cluster					
			Obligatory (n=162)		Noncommitted (n=65)		Enthusiastic (n=299)	
			M (SD)	z	M (SD)	z	M (SD)	z
SWL	32.47***	.11	4.68 (1.36)	-.40	4.80 (1.59)	-.31	5.58 (1.03)	.28
CFC	31.99***	.11	3.38 (.63)	-.41	3.47 (.73)	-.27	3.83 (.56)	.28
ASP Intrinsic	16.61***	.06	4.37 (.58)	-.24	4.44 (.59)	-.13	4.64 (.40)	.16
ASP extrinsic	21.28***	.07	4.04 (.91)	.24	3.32 (.78)	-.67	3.87 (.65)	.01
Health attitude	4.98**	.02	3.55 (.89)	.20	3.35 (.88)	-.02	3.27 (.90)	-.10

Note. \*\* $p<0,01$  \*\*\* $p<0,001$ ; SWL=Satisfaction with Life; CFC= Consideration of Future Consequences; AI-I= Intrinsic Aspirations; AI-E Extrinsic Aspirations; HA= Health Attitude;

**Discussion**

This study aimed to investigate sport commitment profiles based on the sources of commitment. In addition, we also examined the potential role of sport commitment profiles in health and psychological behaviours. The sport commitment profiles were similar to findings from previous studies regarding highly committed, obligatory and low committed groups of athletes (see Raedeke, 1997; Weiss & Weiss, 2003) and are consistent with our original hypothesis. Our other hypotheses were mostly also confirmed. Highly committed athletes perceived higher levels of enjoyment, investments, opportunities, achievements, and social support. Further they perceived a lower level of social constraints and alternatives, while low committed athletes perceived low levels of most of the commitment determinants. In addition, obligatory athletes had higher levels of alternatives (but not of investments and constraints). Our hypotheses regarding group differences were also supported by current findings. The mean values for well-being, future goals and intrinsic aspirations were significantly higher for highly committed athletes, while those for extrinsic aspirations and health attitudes were higher for obligatory athletes. Based on the motivational theory literature (e.g., Self-Determination Theory (Deci & Ryan, 2000), cluster analysis with ten commitment sources was used for better understanding athletes' profiles. Enthusiastic athletes belonged to the first cluster and this cluster expresses sport participation as a positive experience. This profile was similar to Raedeke's (1997) enthusiastic swimmers and attracted athletes as described by Weiss and Weiss (2003). Highly committed athletes perceived higher levels of enjoyment, investment, opportunities, achievements and supports. Enthusiastic athletes reported higher mastery achievements (Desire to Excel-Mastery) than social achievements (Desire to Excel-Social). In terms of two types of Social Support – Emotional and Informal – the previous one showed higher level, similar to previous studies (Scanlan et al., 2016; Weiss & Weiss, 2003). Other Priorities scored the lowest in this group and this result showed consistency with other studies (Scanlan et al., 2016). The score of Social Constraints was lower than other variables in this profile and represents social norms instead of enthusiastic commitment (Scanlan et al., 2016; Sousa, Torregrosa, Viladrich, Villamrin & Cruz, 2007; Wilson et al., 2004). The second cluster consisted of obligatory athletes and this showed similarities with Raedeke's (1997) indifferent swimmers and Weiss and

Weiss's (2003) vulnerable athletes. In this profile, individual improvements are more important than striving to win. Among the commitment resources, only alternatives showed higher scores. Alternatives represent a great burden on sport participation. Many studies show that when the role of alternatives increases, the commitment decreases leading to a conflict in sport participation (i.e., Scanlan et al., 2016; Wilson et al., 2004). Findings are inconsistent about the effects of Personal Investment-Loss (Scanlan et al., 2016; Raedeke, 1997; Weiss & Weiss, 2003). On the other hand, the influence of social norms is well established in the literature (i.e., Scanlan et al., 2003, 2016; Wilson et al., 2004). The third group of athletes included noncommitted athletes. These athletes showed little interest in their sports. Our results suggest that alternatives play an important role in motivation for noncommitted athletes (Weiss & Weiss, 2003; Wilson et al., 2004; Young & Medic, 2011). Despite having a moderate level of enjoyment, they may have a relatively high risk of dropout. Smith and Stein (1991) in an early theoretical study noted the uncommitted profiles and the potential danger of dropout among these unmotivated athletes. In addition, Raedeke (1997) found empirical evidence of this type of profile.

Beyond cluster analysis, we tested whether there are differences in the mean scores of these variables by the emerged clusters. We know little about the relationship of sport commitment with health and psychological variables. Our results showed that enthusiastic athletes indicated higher means for intrinsic values such as enjoyment and opportunities. Thus, having these intrinsic life aspirations may lead to higher well-being (Kasser & Achuvia, 2002; Gurková et al., 2013), more positive mental characteristics (i.e., lower depression, higher self-esteem, etc., see Frederik and Ryan (1993), and satisfaction with basic psychological needs (Sheehan, Herring, & Campbell (2018)). As to extrinsic aspirations, obligatory athletes showed significantly higher levels. Not surprisingly, extrinsic future goals are associated with lower mental well-being (Sheldon et al., 2004; Lee et al., 2010). Although few studies have investigated the role of health attitudes and sport motivation (e.g., Molanorouzi et al., 2014), this variable plays a role in the obligatory profiles as an extrinsic motive to sport participation, which is consistent with Molanorouzi's (2014) findings. While in other studies health was found to be an intrinsically-oriented motivational force (Lavigne et al., 2009; Puante & Anshel, 2010), we assume that living a healthy lifestyle may lead to an obligation to continue with participation in sports. All in all, these findings suggest a clear psychological benefit for enthusiastic athletes compared to other profiles, although this is inherent in the obligation as well, although perhaps less explicitly. Thus, enjoyment may serve as the prominent drive for young athletes to focus on their task, but they also need some rewards or expectations in order to continue with sport participation. It may not be possible to exclude alternatives in an adolescent athlete's life (i.e., school, job, other hobbies, hanging with peers, etc.), but reducing these activities might prevent dropout from sport. Our study has limitations that need addressing. First, we used an elite athlete sample and this likely influenced the sport commitment profiles determined in the study. Using a sample of greater variation of athletes might yield different cluster proportions. Second, in certain analyses we found low level of effect sizes (i.e., Health attitude) and low reliabilities (CFCS). Hence, we believe these scales need further investigations to get an overall better description of their psychological effects. Furthermore, we believe including additional psychological scales may provide greater understanding of athletes' behaviour in the light of their motivation.

## Conclusions

Based on the results of this study, we assert the following major conclusions. First, our study provides evidence of three types of commitment profiles: enthusiastic athletes (those perceiving sport as a positive experience); obligatory athletes (those having a pressure on them); and noncommitted athletes (those being unmotivated). Second, enthusiastic athletes perceived higher well-being, more future goals and intrinsic aspirations. Obligatory athletes reported higher levels of extrinsic aspirations and health-related attitudes. In summary, this study provides evidence of the application of the Sport Commitment Model for adolescent athletes and our findings give guidance for sport psychologists, coaches, and researchers desiring to gain greater understanding of the commitment of their clients. The current study provides a description of types of commitment, psychological behaviours, and health attitudes that can be useful to sports professionals in understanding how young athletes maintain their sports activity and prevent dropout.

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