South African Journal for Research in Sport, Physical Education and Recreation, 2018, 40(1): 125 - 140.
Suid-Afrikaanse Tydskrif vir Navorsing in Sport, Liggaamlike Opvoedkunde en Ontspanning, 2018, 40(1):125 - 140.
ISBN: 0379-9069

PERSONAL AND ECOLOGICAL FACTORS IN SCHOOL SPORT: A MULTILEVEL APPROACH

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ABSTRACT

Ecologies of practice are seen as a major factor that fosters positive experiences of young athletes. The development assets theory, grounded in Bronfenbrenner's bio-ecological theory, provided a useful framework. This study aimed to describe the effects of a sport season-long exposure to development assets, sources of enjoyment and attitude of school sport athletes. The Developmental Assets Profile, Sources of Enjoyment in Youth Sport Questionnaire and Sport Attitudes Questionnaire were administered to 325 participants (249 males, 76 females) aged 13-17 years, pre- and post- season. Multilevel and path analysis were performed. The magnitude of the changes was modest, but younger athletes and girls presented more significant changes. No predicting role of assets was found, although there were significant associations between external assets and enjoyment and pro-social attitudes. The findings suggest that pro-social contents of sport participation, like respect for opponents and being fair in victory and defeat, must be nurtured inside and outside pitches. Ecological climates, where coaches and peers play a decisive role, affect and shape the experiences of young people. Youth coaches and educators must be aware of these possible effects that take place in order to promote a healthy citizenship through sport.

***Keywords*:** Development assets; Enjoyment; Attitudes; Longitudinal; Context.

INTRODUCTION

The potential of sport to influence positive development of youth athletes is implicitly assumed by contemporary societies. In recent literature, the ecologies of practice are seen as a major factor that fosters positive experiences of young athletes (European Commission, 2007; Araújo & Davids, 2009; Strachan *et al.*, 2009; Santos *et al.*, 2011). In particular, the ecological theory (Bronfenbrenner, 1999) has been used to study the developmental process of youth athletes, as it appears to be adequate to explore the different sources of influence on the development of young athletes.

The ecological theory affords importance to individual and contextual characteristics for human development through the model, 'person-process-context-time' (PPCT) (Bronfenbrenner, 1999). The context refers to the global environment where the processes occur, and is subdivided according to the proximity and potential to influence the individual.

The time or chrono-system can be understood in a historical sense, giving meaning to periods or events that affect individuals or social groups.

More recently, a model for positive youth development (PYD) has been proposed (Fraser-Thomas *et al.*, 2005), based on the development assets theory (Benson, 2002), both of which are grounded in Bronfenbrenner's theory. According to the PYD, assets are the 'building blocks' for human development, promoting thriving, resilience and reduced risk behaviours. Assets need to be understood as the outcome of youth interactions inside their communities (Benson, 2002). Developmental assets are divided in two dimensions: internal and external (Benson, 2002; Search Institute, 2005). The internal dimension combines learning commitment, positive values, social competencies and positive identity. The external dimension includes support, empowerment, boundaries and expectations and the constructive use of time. The Developmental Assets Profile (DAP) was created by the Search Institute in Minneapolis (Search Institute, 2005) to measure such assets.

It has been suggested that three particular assets, namely positive identity, empowerment and support, are important for enhancing enjoyment (Strachan *et al.*, 2009), which is associated with positive feelings. The Sources of Enjoyment in the Youth Sport Questionnaire (SEYSQ), developed by Wiersma (2001), includes a six-factor model in the original version, specifically self-referenced competencies, other referenced competencies and recognition, competitive excitement, effort expenditure, affiliation with peers and positive parental involvement.

Sport participation *per se* is not a positive factor of influence in the positive development of the youth, and in some circumstances, it might even lead to negative behaviours and anti-social values (Shields *et al.*, 2002). The Sport Attitudes Questionnaire (SAQ) has been proposed to measure the moral attitudes of athletes (Lee *et al.*, 2008). The instrument has a four-factor model including commitment, convention, gamesmanship and cheating. Previous studies showed the links between sport attitudes and achievement orientations, which represent an ecological characteristic of the training process (Gonçalves *et al.*, 2010).

Assets, enjoyment and attitudes were the subjects of the three questionnaires, DAP, SEYSQ, and SAQ. These instruments were designed and used in specific cultural contexts, particularly North-American and British contexts. Their transfer to different cultures must be cautious and must respect cross-cultural differences (Strachan *et al.*, 2009). This is especially true for assets and enjoyment, because of their strong links to culture, education, and social life organisation (Fraser-Thomas *et al.*, 2005; Fraser-Thomas *et al.*, 2010). The validation process of DAP and SEYSQ for the Portuguese reality did not match the same factor model as in the original studies (Santos & Gonçalves, 2012). Five factors were identified for the DAP, three internal (learning commitment, positive values and positive identity) and two external (support and boundaries and expectations). For the SEYSQ, five factors were identified: self-referenced competencies, other-referenced competencies and recognition, effort expenditure, affiliation with peers, and positive parental involvement (Santos & Gonçalves, 2012).

The assets are dispositional, meaning that they tend to be relatively stable across time (Strachan *et al.*, 2009). Enjoyment and attitudes seem to be dependent on the training environment (Petitpas *et al.*, 2005). It has been hypothesised that empowerment, positive identity and social competencies are predictors of enjoyment, and a predictive path between empowerment and

enjoyment has been found (Strachan *et al.*, 2009). These findings are important for coaches because they support the key role of autonomy to enhance positive experiences (Cronin & Allen, 2015). Given the lack of correspondence between the original factor structure and the Portuguese version, it is necessary to test the relationships between assets and enjoyment in different cultural settings. Furthermore, the moral aspects of sport participation, encompassed in the concept of fair-play, are always present in youth sport, being strongly dependent on the climate of practice (Cronin & Allen, 2015). Thus, the inclusion of attitudes in the study, and the analysis of their relationship with assets and enjoyment can generate important knowledge for coaches, families and youth sport organisers.

It is known that the effects of sport participation depend on the years of exposure to training environments (Stephens, 2000; Visek & Watson, 2005). Thus, a longitudinal design should explore the potential effects of a season-long participation in practices and competitions on the constructs under analysis, and indirectly, on the way young athletes deal with the complexity of personal interactions provided by sport and how they shape their own vision about sport. This multilevel approach is deemed suitable to evaluate the effects of training in diverse settings, with diverse interactions and on all kinds of variables (Papaioannou *et al.*, 2004).

PURPOSE OF STUDY

In Portugal, schools and sport clubs have a similar organisation with respect to specialisation, weekly practices and competitions. Due to the differences in factor structure between the translated instruments and the original ones and the composition of the sample, the study assumes also a cross-cultural, exploratory characteristic. Internal and external factors of assets can predict enjoyment and attitudes (Strachan *et al.*, 2009). Since sport has shown potential for promoting individual and community development (Fraser-Thomas *et al.*, 2005), and the results from sport involvement are influenced by the athlete and contextual characteristics, this study aims to describe the effects of a sport season-long exposure on the development assets, sources of enjoyment, and attitudes of school sport athletes.

METHODOLOGY

Participants

Participants were 325 school sport athletes (249 males, 76 females, 13.0±2.1 years; range 13-17 years) participating in several sports (Handball, Volleyball, Basketball, Futsal, Soccer, Gymnastics, Badminton, Swimming and Tennis). The athletes had been involved in sport practice for 4.8±3.3 years. The rate of girls participating in school sport (23%) is similar to, although slightly lower than, the rates of female participation in Portuguese organised sport (28%).

Ethical clearance

The Ethical Committee of the Faculty of Sports Science and Physical Education of the University of Coimbra (CE/FCDEF-UC/00082014) approved the study. Written informed consent was obtained from parents and coaches.

Measures

Development Assets Profile (DAP): This questionnaire was developed by the Search Institute (2005) and is composed of 58 items and are preceded by an introduction. Statements in the DAP are rated as 'Not at all or rarely' (1), 'Somewhat or Sometimes' (2), 'Very Often' (3) and 'Extremely or almost always' (4). The Portuguese version (Santos & Gonçalves, 2012) measures external and internal factors from a personal perspective, such as, *support* (4 items), *boundaries and expectations* (5 items), *commitment to learning* (4 items), *positive values* (3 items), *positive identity* (5 items). The Portuguese version has adequate reliability estimates of Cronbach's alpha (0.70 to 0.82) for the above factors.

Portuguese version of the Sources of Enjoyment in Youth Sport Questionnaire (SEYSQ) (Wiersma, 2001): The psychometric characteristics of the Portuguese version of the SEYSQ (Santos & Gonçalves, 2012) was established with adequate reliability and validity. It has 28 items scored on a five-point scale (1=not at all, 2=a little, 3=not sure, 4=yes and 5=very much). The Portuguese version assesses *positive parental involvement* (4 items), *self-referenced competencies* (4 items), *other-referenced competencies and recognition* (5 items), *effort expenditure* (3 items) and *affiliation with peers* (4 items). The SEYSQ subscales have good reliability where Cronbach's alpha ranges from 0.78 to 0.85. For both measures, confirmatory factor analysis was performed.

Sport Attitudes Questionnaire (SAQ-2): The SAQ-2 (Lee, 1996) has 23 items scored on a five-point scale (1=totally disagree, 2=disagree, 3=don't agree or disagree, 4=agree, 5=totally agree), that measure *cheating*, *gamesmanship*, *commitment to sport* and *respect for conventions*. The Portuguese version has been translated with good reliability with Cronbach's alpha values ranging from 0.70 to 0.90 (Gonçalves *et al.*, 2006).

The results of DAP are labelled *Assets*, those of SEYSQ are labelled *Sources of Enjoyment* and the SAQ-2 results are labelled *Sport Attitudes*.

Procedures

The participants were recruited from sport teams of different schools. The coaches were contacted by telephone, which was followed by an individual interview to prepare athletes through personal contact within the classroom. Athletes were contacted in person at each school, in the participants´ classrooms. Parental authorisation was obtained to participate in the study. The questionnaires were administered always in a room of the sport facility in the presence of one of the researchers on two different occasions before a practice session, namely once immediately before the pre-competitive period and once before the national finals. The first and last measures were separated by a five-month period. It took approximately 30 minutes to complete the questionnaires each time.

Statistical analysis

The assumption of normality was checked by using the Kolmogorov-Smirnov test, with Lilliefors' significance correction, and by visual inspection of normality plots (Tabachnick & Fidell, 2007). Descriptive statistics (mean±standard deviation) were applied for all measures at the beginning and the end of training.

The interpretation of seasonal changes in behavioural characteristics (repeated-measures data) is not straightforward and traditional approaches to analyse repeated-measures data, in particular repeated measures ANOVA, may be inaccurate (Singer & Willett, 2003). An alternative to explore training responses or seasonal changes in behavioural characteristics is to adopt a multilevel modeling approach (Singer & Willett, 2003; Carvalho *et al.*, 2013; Gonçalves *et al.*, 2014). Thus, multilevel regression modeling was performed to examine changes in assets, sources of satisfaction and attitudes as a consequence of training, based on a pre- and post-season design (unconditional linear model) (Singer & Willett, 2003). Each participant's repeated measures, that is pre-training exposure and post-training exposure, were defined as level 1, nested within participants (level 2). The 95% confidence limit for each effect was calculated to make inferences about the true (population) values of the effect of training (Batterham & Hopkins, 2006). The between-subject standard deviation for each dependent variable was used to convert the values of absolute changes in responses into standardised (Cohen, 1988) changes in the mean. The smallest standardised change was assumed to be 0.20 (Cohen, 1988).

To test the hypotheses concerning the associations of age and gender with differences in initial status and changes in responses of participants to a season-long training exposure on the dependent variables, inter-individual variation in age, gender (dummy variable: male=0; female=1) and interaction between gender and response to change with training (cross level interaction) were added (level 2) as in conditional linear models. All parameters were fixed with the exception of the constant (intercept term) and changes in responses to training exposure (slope) parameters, which were allowed to vary randomly at level 2 (between individuals).

Akaike information criterion (AIC) that takes into account the different numbers of fitted parameters in the different model structures to be compared, as well as visual inspection of residual plots, were performed to determine the final validity of the models to fit responses of the dependent variables as a consequence of training, considering the effects of the predictor variables. Significance was set at $p<0.05$. Statistical analyses were performed using mixed linear procedures available on SPSS version 20.0 (IBM SPSS Statistics for Windows, Version 20.0. IBM Corp. Armonk, NY, USA).

The potential predictive effect of Assets on Enjoyment and Attitudes was examined through structural equation modelling, with AMOS software, version 21.0.0. The fit of the models was evaluated using the comparative fit index (CFI) and standardised root mean square residual (SRMR). The cut-off values were 0.95 for CFI and 0.08 for SRMR. For the estimation of the model, the maximum likelihood method was applied.

RESULTS

The first analysis explored the changes between the pre and post five-month training period measurements. The multilevel technique was performed with the entire sample separately for Assets, Sources of Enjoyment and Sport Attitudes. The results indicated that *Assets* are rather stable, and have little variation in the mean scores. Only learning commitment showed a significant decrease over the five-month period (change in mean= -2.9%; 95% CL -5.4 to -0.3%), but without a meaningful change in the variable (Table 1).

For the five dimensions of *Sources of Enjoyment*, three of them, self-referenced competencies, positive parental involvement and affiliation with peers, presented no changes in the mean composite scores. The other two dimensions, effort expenditure (change in mean=2.9%; 95% CL 0.8 to 5.0%) and others-referenced competencies (change in mean=5.5%; 95% CL 1.9 to 9.2%), presented an increase in the mean composite scores (Table 1).

***Table 1*. MEAN CHANGES ACROSS A FIVE-MONTH TRAINING PERIOD**

Constructs and dimensions	**Pre-training** M±SD	**Post-training** M±SD	**Changes in mean** 95% CL (%)	**Significance** p
Assets				
Support	3.55±0.45	3.56±0.47	0.2 (-1.6 to 2.0)	0.84
Boundaries and expectations	3.04±0.54	3.05±0.53	0.2 (-1.6 to 1.9)	0.84
Learning commitment	3.28±0.61	3.21±0.70	-2.9 (-5.4 to -0.3)	0.03
Positive values	2.99±0.70	2.99±0.71	-0.1 (-3.6 to 3.3)	0.94
Positive identity	3.18±0.55	3.20±0.55	0.4 (-2.0 to 2.9)	0.72
Sources of enjoyment				
Self-referenced competencies	4.37±0.53	4.38±0.52	0.4 (-1.2 to 2.1)	0.62
Others referenced competencies	3.47±0.89	3.66±0.90	5.5 (1.9 to 9.2)	<0 01
Effort expenditure	4.28±0.61	4.40±0.57	2.9 (0.8 to 5.0)	0.01
Affiliation with peers	4.22±0.60	4.25±0.58	0.8 (-1.2 to 2.8)	0.42
Positive parental involvement	4.02±0.86	4.04±0.88	-0.1 (-3.2 to 2.9)	0.93
Attitudes				
Cheating	3.01±1.37	2.57±1.23	-15.8 (-24.3 to -7.4)	<0 01
Gamesmanship	3.56±1.09	2.95±1.17	-22.8 (-29.8 to 15.7)	<0 01
Convention	3.63±1.09	4.14±0.88	15.6 (10.8 to 20.4)	<0 01
Commitment	3.89±1.04	0.62±0.62	14.6 (10.4 to 18.9)	<0 01

Attitudes was the construct that presented significant changes between pre- and post-training period. All the changes assumed a pro-social trend, with the mean composite scores for cheating (change in mean= -15.8%; 95% CL -24.3 to -7.4%) and gamesmanship (change in mean= -22.8%; 95% CL -29.8 to 15.7%) decreasing, and convention (change in mean = 15.6%; 95% CL 10.8 to 20.4%) and commitment (change in mean=14.6%; 95% CL 10.4 to 18.9%) increasing (Table 1).

The influence of age and gender as covariates of behavioural changes across the five-month training period are presented in Tables 2, 3 and 4. When the multilevel analysis include age and gender as co-variables, the results for intercept and slopes presented some modifications, when applied to the whole sample. Age was related to differences in initial responses in support (exponent= -0.05; standard error=0.01), boundaries and expectations (exponent= -0.09; standard error=0.01), learning commitment (exponent= -0.08; standard error=0.02) and positive values (exponent= -0.10; standard error=0.02). The coefficients suggest that younger athletes tended to have lower scores in the initial responses in Developmental Assets (Table 2).

Changes in responses to training exposure in learning commitment were cancelled out when age was accounted for. Interestingly, when accounting for age, individual trends to express lower scores at the end of the season were apparent for positive identity. Moreover, the interaction term between gender and changes in responses to training exposure coefficient indicate that girls had a slightly lower rate of change across the season compared to boys.

***Table 2*. MULTILEVEL LINEAR MODELING FOR DEVELOPMENTAL ASSETS**

Fixed explanatory variables	**Support** M±SD	**Boundaries & expectations** M±SD	**Learning commitment** M±SD	**Positive values** M±SD	**Positive identity** M±SD
Exponent value					
Constant	4.29±0.19**	4.25±0.21**	4.41±0.27**	4.52±0.29**	3.54±0.23**
Age	-0.05±0.01**	-0.09±0.01**	0.08±0.02**	-0.10±0.02**	-0.02±0.01
Gender	-0.15±0.07*	0.48±0.07**	0.08±0.10	-0.14±0.11	0.04±0.09
Changes in responses	0.01±0.03	0.01±0.03	-0.10±0.04**	-0.01±0.05	0.03±0.04
Gender changes in responses	0.11±0.07	-0.02±0.06	0.18±0.09*	0.08±0.01*	-0.07±0.09
Variance-Covariance					
	Level 1 (within individuals)				
Constant	0.06±0.01**	0.02±0.01**	0.08±0.01**	0.15±0.02**	0.10±0.01**
	Level 2 (between individuals)				
Constant	0.13±0.02**	0.19±0.02**	0.26±0.03**	0.30±0.04**	0.19±0.02**
Changes in responses	0.09±0.00	0.11±0.00	0.17±0.00	0.20±0.00	0.13±0.00
-2 Restricted Log Likelihood	552.321	516.012	854.284	980.375	765.824
Akaike's Information Criterion	570.321	534.012	872.284	998.375	783.824

Exponent value=Exponent value (standard error) ** p<0.01; * p <0.05
Variance-Covariance =Variance-Covariance matrix of random variables

With the exception of other-referenced competencies (exponent= -0.05; standard error=0.02), age did not appear to be related to inter-individual variability in initial responses in the Sources of Enjoyment dimensions (Table 3). Changes in responses to training in other-referenced competencies were cancelled out when age was accounted for.

When controlling for age, changes in responses in Sport Attitudes, were more evident for all variables as the rate of change varied between 1.36 and 2.62 in absolute values. Inter-individual variability in initial responses in the Sport Attitudes dimension was not related to the age of young athletes. However, the differences in responses to training exposure were explained by age (Table 4). The interaction term between age and changes in responses to training exposure coefficients for cheating (exponent=-1.62; standard error=0.25) and gamesmanship (exponent= -1.61; standard error=0.22) indicate that girls had a slightly lower rate of change across the season compared to boys. As for the interaction term between age and changes in responses to

training exposure coefficients for convention (exponent=1.67; standard error=0.17) and commitment (exponent=1.56; standard error=0.15), the results indicate that younger athletes showed slightly less increases per interval compared with athletes on the grand mean for age.

Table 3. **MULTILEVEL REGRESSION ANALYSIS FOR SOURCES OF ENJOYMENT**

Fixed explanatory variables	**Self-referenced competencies** M±SD	**Others referenced competencies** M±SD	**Effort expenditure** M±SD	**Affiliation with peers** M±SD	**Positive parental involvement** M±SD
Exponent value					
Constant	4.38±0.22**	4.25±0.38**	4.55±0.23**	4.67±0.25**	5.31±0.38**
Age	0.00±0.01	-0.05±0.02*	-0.01±0.02	0.00±0.02	-0.09±0.02**
Gender	-0.29±0.08**	-0.41±0.14**	-0.63±0.09**	-0.17±0.09	-0.14±0.14
Changes in responses	-0.02±0.04	0.18±0.06**	0.00±0.02	0.00±0.04	-0.01±0.05
Gender changes in responses	0.21±0.07**	0.08±0.01	-0.64±0.10**	0.15 ±0.09	0.11±0.11
Variance-Covariance					
	Level 1 (within individuals)				
Constant	0.08±0.01**	0.21±0.03**	0.13±0.02**	0.09±0.01**	0.11±0.02**
	Level 2 (between individuals)				
Constant	0.18±0.02**	0.55±0.07**	0.19±0.03**	0.26±0.03**	0.60±0.06**
Changes in responses	0.12±0.00	0.34±0.00	0.14±0.00	0.15±0.00	0.32±0.00
-2 Restricted Log Likelihood	699.682	1225.917	813.982	811.134	1142.868
Akaike's Information Criterion	717.682	1243.917	831.982	829.134	1160.868

Exponent value=Exponent value (standard error) ** p<0.01; * p<0.05
Variance-Covariance =Variance-Covariance matrix of random variables

Gender seems to be the co-variable with the biggest impact on the responses of the athletes. For the Assets, boys and girls presented different scores at the pre-training measurements and showed no significant differences in slope in external Assets, support (exponent= -0.15; standard error=0.07), and boundaries and expectations (exponent=0.48; standard error=0.07). Regarding internal factors, commitment to learning (exponent=0.18; standard error=0.09) and positive values (exponent=0.08; standard error=0.01), girls showed an increase in scores for all of them, while boys presented a stable or a slight decreasing slope.

For the Sources of Enjoyment factors, boys showed higher scores than girls at the pre-training measurements, and the results did not change at the end of the five-month training period, with the exception of other-referenced competencies, which showed a moderate increase (exponent=0.21; standard error=0.07). On the other hand, girls showed higher scores at the end of the five-month training period in all the Enjoyment factors, and particularly higher than boys for effort expenditure (exponent= -0.64; standard error=0.10).

***Table 4*. MULTILEVEL REGRESSION ANALYSIS FOR SPORT ATTITUDES**

Fixed explanatory variables	**Cheating** M±SD	**Gamesmanship** M±SD	**Convention** M±SD	**Commitment** M±SD
Exponent value				
Constant	2.66±0.49**	3.38±0.42**	4.76±0.35**	4.67±0.27**
Age	0.02±0.03	0.01±0.03	-0.06±0.02**	-0.03±0.02
Gender	0.49±0.22*	0.45±0.18**	-1.52±0.15**	-1.62±0.13**
Changes in responses	-0.13±0.11	-0.31 ±0.09**	0.20±0.07**	0.14±0.07*
Gender changes in responses	-1.62±0.25**	-1.61±0.22**	1.67±0.17**	1.56±0.15**
Variance-Covariance				
		Level 1 (within individuals)		
Constant	0.06±0.01**	0.02±0.01**	0.08±0.01**	0.15±0.02**
		Level 2 (between individuals)		
Constant	0.13±0.02**	0.19±0.02**	0.26±0.03**	0.30±0.04**
Changes in responses	0.09±0.00	0.11±0.00	0.17±0.00	0.20±0.00
-2 Restricted Log Likelihood	552.321	516.012	854.284	980.375
Akaike's Information Criterion	570.321	534.012	872.284	998.375

Exponent value=Exponent value (standard error) ** p<0.01; * p<0.05
Variance-Covariance =Variance-Covariance matrix of random variables

Regarding Sport Attitudes, boys expressed higher scores than girls for convention (exponent= -1.52; standard error=0.15) and commitment (exponent= -1.62; standard error=0.13), while girls had higher scores than boys for cheating (exponent=0.49; standard error=0.22) and gamesmanship (exponent=0.45; standard error=0.18) at the pre-training measurements. The evolution of the slope at the end of the five-month training period was similar for boys and girls, with an increase in scores for convention (exponent=0.20; standard error=0.07) and commitment (exponent=0.14; standard error=0.07) and a decrease for gamesmanship (exponent= -0.31; standard error=0.09). The large difference between genders (see interaction terms between gender and changes in responses in Table 4) is explained by the higher significant changes at the end of the five-month training period for girls.

Overall, the results from the multilevel models suggest there was still significant residual variance in initial intercepts to be explained for all dependent variables. This indicates that other covariates may be considered to explain variation between players. No significant residual variance in slopes was left to be explained across individuals. Thus, after partitioning gender influence on slopes (changes in response across the five-month season), fixed effects for changes in response appropriately described the response for all the sample.

To test the predictive role of assets, path analysis was performed. It was hypothesised that internal and external factors of Assets can predict Sources of Enjoyment and Sport Attitudes

(Strachan *et al.*, 2009). An alternative model, with support as a predictor for Sources of Enjoyment and Sport Attitudes, was also tested. The two models failed to match the cut-off values for CFI and SRMR (Santos & Gonçalves, 2012). After that, support was tested as a predictor of enjoyment and positive attitudes (convention and commitment). The predictive role of internal assets for self-referenced competencies, affiliation with peers and negative attitudes (cheating and gamesmanship) was also tested. Again, the results did not match the cut-off values of the fit indexes CFI and SRMR (Santos & Gonçalves, 2012).

DISCUSSION

The aim of this study was to describe the effects of a sport season-long exposure on the development assets, sources of enjoyment and attitudes of school sport athletes. Few studies have addressed the topic of moral education as an important part of a positive participation in youth sport. Positive correlations between mastery orientation with enjoyment and with positive attitudes have been reported (Duda, 2001; Roberts, 2001). It seems plausible to hypothesise that the expression of Assets would play a positive role in increasing the sense of satisfaction and reducing negative attitudes (Strachan *et al.*, 2009). Furthermore, it has been observed that support and empowerment could play a prediction role with regard to Sources of Enjoyment, with positive identity playing a mediational role (Strachan *et al.*, 2009). Interestingly, the same authors found that the perception of support may diminish positive identity, as a construct related to competence and self-esteem, which can be undermined by the interference of adult support. Côté and Hay (2002) suggested that support may vary across different stages of progression of an athlete. This is a question that needs clarification in the future.

The present study faced two major challenges. Firstly the lack of adequacy of the original model of Assets and Sources of Enjoyment factors for the Portuguese population, removing empowerment as possible predictive factor. On the other hand, the time dimension, although a crucial one in Bronfenbrenner's theory, is scarcely studied in literature. The lack of adequacy of the tested predictive models highlights the complexity of factors and influences that produce the perceptions of sport participation and how it fits in the life of young people (MacNamara & Collins, 2015). The strong associations between some of the variables indicate that the interaction between assets, enjoyment and attitudes is real and play a significant role in the definition of the context.

The external assets of support and boundaries and expectations should provide the adequate context for athletes to learn social and specific rules, to develop commitment and persistence and to control their emotions (Strachan *et al.*, 2009). A supportive environment based on a positive atmosphere and a clear mastery orientation in practices and competitions can contribute to helping athletes understand their roles within the team and to develop strong feelings of belonging (Camiré *et al.*, 2014). A positive or negative climate is mainly the consequence of the action of families, coaches and peers (Cronin & Allen, 2015). During pre-adolescence and early adolescence years, the parents, and sometimes the coach, are the key influences (Camiré *et al.*, 2014). Among older youth, peers start to shape the social environment, when the teams profit from cohesion and social influence (Côté & Hay, 2002). That is why it is important to pay attention to the possession of assets and to assess their expression over a long period of time. The present results show that external assets relate with

all the dimensions of enjoyment and with half of the attitudes, stressing the importance of support, especially for the younger athletes.

The internal assets focus on the development of personal life skills transferable to other areas of life. This is particularly true for learning commitment and positive values, which refer to school engagement or equality and social justice and qualities that are not sport-specific but assume a key and importance position in sport participation to claim for a positive role in youth development (Fraser-Thomas *et al.*, 2005).

Positive identity is important to promote an opportunity for young people to discover themselves and feel useful within their teams (Strachan *et al.*, 2009). However, coaches must be careful not to reduce self-identity to athletes-identity (Stephens, 2000; Coakley, 2001; Shields *et al.*, 2002), because this may lead to the expression of negative attitudes (Gonçalves *et al.*, 2010). Therefore, the focus must be placed on developing personal competencies in both physical and social skills (Light, 2013).

Autonomy has been pointed out as a key factor for the youngsters to feel in control of their choices and lives (Gonçalves *et al.*, 2011), and to foster the athletes' self-regulation processes (Jonker *et al.*, 2010). The traditional sport context provides a role in a team and teaches how to play by the rules, how to control emotions and how to prepare to face difficult challenges (Camiré *et al.*, 2014). If the context also allows the development of autonomy and initiative, then the expression of pro-social attitudes and the feeling of being a relevant member of the group are more likely to occur (Lee *et al.*, 2008).

The external asset of support allows for these outcomes to occur in sport, but coaches must be aware of its importance. It is also important for coaches to monitor and nurture internal assets, which relate strongly with self-referenced competencies and affiliation with peers (Strachan *et al.*, 2009). Assets like learning commitment or positive identity are not sport-specific, rather they refer to school engagement and self-esteem. Yet it must be remembered that individuals are both products and producers of the environment (Gano-Overway *et al.*, 2009).

Younger people are more likely to value praise, encouragement and positive reinforcement given by parents and coaches as sources of relevant information (Côté *et al.*, 2009). The support of parents and coaches becomes less important in the adolescent years, being replaced by a more valued peer assessment (Côté & Hay, 2002). The findings show that age moderates the effects of training, suggesting that the effectiveness of the coaches' intervention is more important among younger athletes.

Because these particular assets affect young people in a time when they are searching their own identities and roles (Strachan *et al.*, 2009), their contribution to a rewarding sport experience in a group of peers is a very important one. Creating a supportive environment by providing encouragement and a positive climate can enable young people to enjoy their experience. Findings indicate that the relationship between sports participation and enjoyment or positive attitudes are not to be direct and may be influenced by contextual factors (Scanlan & Lewthwaite, 1986; McCarthy *et al.*, 2008; MacDonald *et al.*, 2011). The quality of the athlete-

coach relational context is one potential factor that might moderate the relations between sport participation and self-esteem (Coatsworth & Conroy, 2006).

In this study, participants exhibited significant variability in their starting values, with younger athletes and girls expressing higher values on external assets, enjoyment and pro-social attitudes, and lower scores in negative attitudes than their older and male peers. The magnitude of the changes over the five-month period is small to modest and the younger participants and girls change at a faster pace. The older athletes tend to change at a very slow pace.

Girls present a different slope than boys, expressing more significant changes in enjoyment factors, like self-referenced competencies, affiliation with peers and effort expenditure. Regarding attitudes, girls show an increase in scores for convention and commitment and a decrease for cheating and gamesmanship. The findings suggest that the exposure to sport during the season fostered a positive adaptation for all participants, consistent with observations in pre-adolescents and girls (Chin *et al.*, 2009). Again, the role of external assets appears to be a crucial one, namely the support factor. In early stages of sport participation and with girls, strong support offered by adults provides optimal conditions for positive personal development. The role of the coach is perhaps the most important source of support, as support is not the role of the families alone (Cronin & Allen, 2015).

The findings related to sport attitudes confirm that a caring sport environment can foster positive moral decisions and reduce negative outcomes. Both external and internal assets correlate positively with convention and commitment and negatively with cheating and gamesmanship, suggesting that pro-social contents of sport participation, like the respect for opponents and to be fair in victory and defeat, must be nurtured inside and outside pitches and gyms (De Martelaer *et al.*, 2013).

The present study shows that sport engagement causes effects that are never neutral. The youngsters enter the practices with their own personal assets that are to be confronted with the climate, rules and social interactions inside the team. The dialogue, and sometimes the contrast, between these two realities are going to build and shape an experience that is should last for the rest of the participants' lives. To what extent the environment can interact with personal dispositions, is a question that remains unanswered. The answers are possible through pre- and post-test designs to follow the evolution of the observed variables during years of sport participation (MacNamara & Collins, 2015). It has been argued that time limitations are the main obstacle to observe positive adaptations with experimental groups (Holt, 2008).

This study presents some limitations and needs to be complemented with further research. The heterogeneity of the sample, due to the differences by gender, type of sport or the quality of the school sport programme, can be considered as an advantage or an obstacle. From an exploratory point of view, the fact that the sample includes a variety of schools, teams, coaches and sports is clearly an advantage, due to the possibility of exploring the relations between assets and sport outcomes in a great diversity of settings. But, it can also be considered as a constraint, if the aim is to analyse more specific ecological effects over time. Further research should focus on the contextual effects of one club or school atmosphere, on the climate orientations fostered by one coach or teacher, or on the specific effect of one sport.

Another limitation of the sample is the lesser number of girls compared to boys. If the percentage represents the participation of girls in sport, it could influence the results. Girls display a more pro-social behaviour and possess more developmental assets than boys (Strachan *et al.*, 2009; Gonçalves *et al.*, 2010). At the same time, they react more positively to supportive sport environments (Gonçalves *et al.*, 2011). The results would probably be different if the number of female athletes matched the number of their male peers.

The study has important pedagogical implications. The potential role of sport for positive development, as a most important activity for young people, contrasting with healthy life style-oriented programmes is well known (Light, 2013). It is expected that positive learning through sport is transferable to other domains of life and lasts during adulthood (Cronin & Allen, 2015). However, the effectiveness of sport participation cannot rely exclusively on the family to provide all the assets. The study of contexts of practice and of their effects over time is an important theme for most significant adults and scholars. Ecological climates, where coaches and peers play a decisive role, affect and shape the experiences of young people by helping them to develop autonomy, self-esteem, enjoyment and positive attitudes. Based on the findings, significant adults must be encouraged to create supportive environments, as a positive climate is strongly related to the development of young people. The relationship between Assets and Sources of Enjoyment suggests that a supportive climate is not the exclusive task of the coach or the school administrators, but also involves the athletes' families and communities. Youth coaches and educators must be aware of these possible effects that take place during long periods of time, in order to promote a healthy citizenship through sport.

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(Subject Editor: Prof Dorita du Toit)