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Training and motivation in childhood and adolescence in Finnish elite footballers at different phases of their athletic careers

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Abstract

This study retrospectively explored 1) early specialization and hours of training in childhood and adolescence and 2) the interrelations of different types of motivation in four samples of elite male footballers in different phases of their athletic careers (N=91): Finnish first-tier players (n=23), youth national team players (U19 and U21; n=33), national team players (n=22), and Finland's so-called Golden Generation players of the 1990s and 2000s (n=13). For this study, the Golden Generation was defined by FAF as footballers who had played at least ten official World cup or European championship qualifying games between the years 1996–2008 and played in international top leagues during their career. Data were collected anonymously by an online survey. Descriptive statistics were used to analyze the mean values of childhood and adolescent training hours and motivation types. The normality of the data distribution was tested by the Shapiro-Wilk test. Differences between the player groups in practice hours in childhood and adolescence were analyzed by the nonparametric Kruskal-Wallis test and the significance level for pairwise comparisons was adjusted by Bonferroni correction. Interrelations between the players' motivation types were analyzed with Spearman's correlational coefficients. The results showed that the players had specialized in football at around age 11. Most (81%) had also practiced another sport. Football practice hours, which increased throughout childhood and adolescence, were higher than combined training for other sports. The Golden Generation players spent the least time on organized practice and the most on unorganized training and other sports in the early years. The elite footballers scored highest in intrinsic motivation and lowest in amotivation towards football. Intrinsic motivation and the two forms of autonomous extrinsic motivation were positively intercorrelated. Amotivation was negatively associated with intrinsic motivation and positively with external regulation.

Key Words: football, national team, youth national team, the Golden Generation, organized practice, unorganized practice

Introduction

The sport paths taken by competitive athletes to reach their full potential during their sports careers are increasingly being studied. Previous research has shown the benefits of late specialization (Güllich & Emrich, 2014; Hornig et al., 2016) and highlighted the importance of unorganized practice (Renshaw & Moy, 2018) and intrinsic motivation (Panagiotis, 2020; Zuber et al., 2015) in the first phases of the athletic career. This study explored the age of specialization, childhood and adolescent training, and motivation of four elite samples of male footballers in different athletic career phases: Finnish first-tier players, youth national team players (U19 and U21), national team players, and Finland's so-called Golden Generation players of the 1990s and 2000s.

Côté's (1999; Côté & Vierimaa, 2014) developmental model of sport participation (DMSP) divides the athletic career into three phases: the sampling years (age 6–12) and the specializing years (age 13–15), the focus of this paper, and the investment years (from age 16 onwards). In the DMSP model, the future professional athlete has two options: early or late specialization. Athletes on the late specialization path typically do not attach too strongly to their chosen sport before the specializing years. During the sampling years, practice may include deliberate play that gradually develops towards deliberate practice. The increase in deliberate practice continues during the specializing years towards the investment years and is a vital part of development toward the elite level (Ford et al., 2009; Hendry et al., 2018; Hendry & Hodges, 2019).

In contrast, a child specializing early in a sport starts to practice deliberately and compete at a young age without trying other sports (Baker et al., 2009). Specializing and investing in a single sport starts already during the sampling years for those on the early specialization path. In football, however, specialization can follow the hybrid model proposed by Hendry and Hodges (2019), that is, elite footballers can engage and invest most of their time in football at an early age while continuing participation in other sports. In a large meta-analysis, Güllich et al. (2021) concluded that multisport practice during childhood and adolescence led the players to achieve their peak later in their careers. They also emphasized the fact that the predictors of high performance were opposite for junior and senior levels (Güllich et al., 2021).

For example, Ford et al. (2009) found that players who later become professional trained more between ages 6–12 than those who did not. The difference was not due to more hours of organized practice or the number of official games but to hours spent in unorganized practice. Recent studies of footballers' athletic careers have shown that late specializers had longer elite-level careers than early specializers (Güllich & Emrich, 2014; Hornig et al., 2016; Knapik et al., 2020). Research shows that this is mainly because of the amount of injuries, severe injuries in particular, that are much more common for players who have specialized early on their career (Campbell et al., 2021). Results on the amount and the type of footballers' early training years have been inconsistent. Hornig et al. (2016) found that elite players' training included more unorganized than organized practice until age 14; two hours per week on average until age 10 and two to six hours until age 14. Between age 14 to 18, organized practice increased to approximately five to eight hours per week (Hornig et al., 2016). Pietro and Filomena (2019) also emphasized that unorganized football specific training in addition to the organized training during those years between ages 15–17 does develop the game performance of the players.

In addition to the DMSP model, the present study draws on the self-determination theory (SDT; Deci & Ryan, 2000; 2012), which explains the impact on human behavior of different types of motivation. These vary in the level of self-determination and form a continuum between more self-determined and more controlling types of motivation. The highest level of self-determination is intrinsic motivation, the enactment of an activity for its own sake because it is enjoyable and interesting (Deci & Ryan, 2000; 2012). The four extrinsic types of motivation are either autonomous or controlling. The autonomous types are integrated regulation (the benefits of certain activities accord with one's personal values and goals) and identified regulation (the outcomes of the activity are individually highly valued). The controlling types are introjected regulation (activity due to avoiding internal pressures or feelings of guilt) and external regulation (activity due to external factors, such as rewards or fear of punishment). These extrinsic motivation types are progressively less self-determined and instrumental, leading to the other end of the continuum, amotivation. The difference between motivation and amotivation, as noted by Cresswell et al. (2019), is in the intention to participate in the task at hand. An amotivated footballer has no intention whatsoever to behave in the way expected of him/her at a certain situation. Amotivated footballers do not have a great chance of making it through the specializing years when being forced to play.

In football, a strong intrinsic motivation has been seen as a useful asset for would-be professionals (Zuber et al., 2015). In order to succeed, it is very important for a footballer to develop a strong intrinsic motivation and to maintain it through the career (Hrcek & Bagl'as, 2018) as successful athletes tend to have higher levels of intrinsic motivation compared to external motivation (Zeng & Yang, 2021). Despite of that, Hendry et al. (2019) found that elite youth footballers' self-determined motivation decreased as they approached professionalism, although they continued to score higher in self-determined motivation than non-elite players.

As shown in the literature cited above, previous research speaks clearly for late specialization (Güllich & Emrich, 2014; Hornig et al., 2016; Knapik et al., 2020), unorganized practice (Pietro & Filomena, 2019; Renshaw & Moy, 2018) and intrinsic motivation (Hrcek & Bagl'as, 2018; Panagiotis, 2020; Zeng & Yang, 2021; Zuber et al., 2015) generally in sport, including football. However, current empirical studies do not seem to be able to compare several groups of elite footballers in different ages and phases in their athletic careers, because they have mainly investigated junior footballers (Calvo et al., 2010; Garcia-Mas et al., 2010), mixed-gender groups (Panagiotis, 2020) and samples with only one or two (Ford et al., 2009) groups of elite footballers. Secondly, much of the research evidence comes from the countries that Szerovay (2018, p. 14) terms so-called core football countries, namely, England, Germany, Spain, Italy, and France. Although football is Finland's most popular sport, with over 140 000 licensed footballers and about 500 000 Finns who cite football as their hobby (Football Association of Finland, FAF, 2020), and although Finland has produced some excellent individual players who have enjoyed European glory in their club teams, it is fair to say that Finland can be referred to as a less developed football country, or alternatively a periphery country (Szerovay, 2018, p. 25).

Given the lack of research on football played in less developed football countries, and a scarcity of studies that have investigated multiple groups of elite footballers in a single study, this study retrospectively explored 1) early specialization and training hours during childhood and adolescence and 2) the interrelations of different types of motivation in four elite samples of Finnish male footballers: first-tier players, youth national team players (U19, U21), national team players, and Finnish Golden Generation players of the 1990s and 2000s. We expected the Finnish elite footballers to have had a lot of football-specific practice in their youth, to have engaged in the sport at an early age and also to have practiced secondary sports thereafter (Hendry & Hodges, 2019; Knapik et al., 2020). Based on Hendry et al. (2019), Zeng and Yang (2021) and Zuber et al. (2015), we also assumed that intrinsic motivation toward football would be typical of all four elite footballer groups.

Materials and methods

Participants

Ninety-one male footballers, representing four groups of elite Finnish footballers in different phases of their athletic career, participated in this study: Finnish first-tier players ($n = 23$, $M_{\text{age}} = 25.5$, $SD = 5.7$); youth national team players (U19 and U21) ($n = 33$, $M_{\text{age}} = 20.3$, $SD = 1.5$), national team players ($n = 22$, $M_{\text{age}} = 27.9$, $SD = 3.4$), and Golden Generation players ($n = 13$, $M_{\text{age}} = 40.9$, $SD = 3.0$). Participants were recruited in collaboration with the Football Association of Finland (FAF). At the beginning of 2016, an anonymous digital

survey was sent by FAF to the team managers of Finnish first-tier players (response rate 15%), youth national team (U19, U21) players (response rate 33%), and Finnish national men's football team players (response rate 44%). At the end of 2016, the digital survey was sent directly to the Finnish Golden Generation players via the FAF email lists (response rate 30 %). For this study, the Golden Generation was defined by FAF as footballers who had played at least ten official World cup or European championship qualifying games between the years 1996–2008 and played in international top leagues during their career.

The online survey, developed in collaboration with FAF, included structured questions on practice and motivation in childhood and adolescence and was completed using Webropol software.

Measures and Variables

Childhood and adolescent practice

Weekly practice hours in childhood and adolescence were measured with six items from the following three categories: organized practice (2 items: organized football practice, organized practice in other sports); unorganized football practice (2 items: individual skill training; playing football with friends); and other physical activities and training (2 items: unorganized individual training for other sports, playing games with friends). Participants estimated how many hours of practice/training per week they had in each category during three different phases of their early athletic career: age 6–9, 10–12, and 13–15.

We also examined *football-specific practice hours* by combining the above categories into football-related practice/training (3 items: organized football practice, individual skill training, playing football with friends) and other training or physical activity (3 items: organized practice in other sports, unorganized individual training for other sports, playing games with friends).

We also asked open-ended demographic questions about the age players started unorganized football, the age they specialized in football, and the types of sport they had practiced alongside football.

Motivation

Motivation during a player's career was measured with the shortened Sport Motivation Scale (SMS II; Pelletier et al., 2013), designed to measure types of motivation based on the SDT. The scale was minimally modified to be football-specific. Players answered 12 items under the heading “Why do/did you play football?” on a 5-point scale ranging from 1 (*Fully disagree*) to 5 (*Fully agree*). The following six sum scores were calculated: 1) *Intrinsic motivation*, comprising the items “Because it is very interesting to learn how I can improve in football” and “Because it gives me pleasure to learn more about football” ($r = 0.40$); 2) *Integrated motivation*, comprising the items “Because football reflects the essence of whom I am” and “Because, through football, I am living in line with my deepest principles” ($r = 0.23$); 3) *Identified motivation*, comprising the items “Because I have chosen football as a way to develop myself” and “Because it is one of the best ways I have chosen to develop other aspects of myself” ($r = 0.57$); 4) *Intrinsic motivation*, comprising the items “Because I feel better about myself when I do” and “Because I would not feel worthwhile if I did not” ($r = 0.33$); 5) *External regulation*, comprising included the items “Because people I care about would be upset with me if I didn't” and “Because people around me reward me when I do” ($r = 0.39$); 6) *Amotivation*, comprising the items “I used to have good reasons for doing sports, but now I am asking myself if I should continue” and “It is not clear to me anymore; I don't really think my place is in football” ($r = 0.45$).

Data analysis

Descriptive statistics were used to analyze the mean values of childhood and adolescent training hours and motivation types. The normality of the data distribution was tested by the Shapiro-Wilk test. Differences between the player groups in practice hours in childhood and adolescence were analyzed by the nonparametric Kruskal-Wallis test and the significance level for pairwise comparisons was adjusted by Bonferroni correction. Interrelations between the players' motivation types were analyzed with Spearman's correlational coefficients. Missing values varied between 0 and 43%. All analyses were carried out without inputting data with IBM SPSS Statistics version 26. A significance level of 0.05 was adopted for all statistical analyses.

Results

Sport background and age of specialization

Seven Finnish first-tier players, four youth national team players (U19, U21), four national team players, and two Golden Generation players had only played football and not regularly participated in organized practice in any other sport ($n=17$, 19%). Football aside, their most common sport as a pastime was ice hockey.

The mean age of starting unorganized football training in all players combined was 4.9 years ($SD = 1.6$). In the first-tier players, it was 5.2 years ($SD = 1.41$), in the youth national team players (U19, U21) 4.4 years ($SD = 1.40$), in the national team players 4.7 years ($SD = 1.85$) and in the Golden Generation players 5.5 years ($SD = 1.71$). The mean age of specialization in all players was 11.0 years ($SD = 3.47$). In the first-tier players, it was 10.1 years ($SD = 4.48$), in the youth national team players (U19, U21) 10.6 years ($SD = 2.79$), in the national team players 12.1 years ($SD = 2.80$), and in the Golden Generation players 11.6 years ($SD = 3.64$).

Weekly training hours during childhood and adolescence

As shown in Table 1, excepting the youth national team players (U19, U20), the Finnish elite footballers showed an increasing trend in weekly hours of organized training from age 6–15. The amount of unorganized football training increased up to age 12, after which it continued at the same level up to age 15 in all players except the first-tier group, whose unorganized football training showed a linear increasing trend from age 6–15. The national team players reported the lowest weekly training hours in the category ‘other physical activity’, indicating that they spent the least time in the unorganized practice of sports or leisure-time activities other than football from age 9–15. In turn, from age 6–12, the Golden Generation players had the lowest weekly averages in organized training and the highest weekly averages in both unorganized practice and other physical activity. The highest total training hours were at age 10–12 in all but the first-tier players, whose highest amount of training was at age 13–15.

Table 1. Elite players practice hours during the early years of athletic career, mean (M), standard deviation (SD), and differences between player groups in different training categories (n=51)

	First-tier (n=13)	Youth national team (n=15)	National team (n=15)	Golden Generation (n=8)	df	H	p
	M (SD)	M (SD)	M (SD)	M (SD)			
Organized							
6-9 years	5.69 (3.47)	8.67 (4.10)	6.00 (2.95)	4.88 (2.53)	3	3.50	.321
10-12 years	9.54 (5.09)	10.47 (4.72)	7.73 (3.49)	7.13 (2.80)	3	1.65	.649
13-15 years	11.15 (5.35)	9.80 (4.20)	8.20 (3.59)	9.25 (3.33)	3	3.13	.372
Unorganized							
6-9 years	7.54 (7.36)	7.00 (3.12)	9.67 (8.13)	10.38 (4.75)	3	2.61	.455
10-12 years	9.31 (8.47)	7.47 (2.92)	11.53 (9.44)	12.13 (6.08)	3	1.93	.587
13-15 years	10.00 (12.44)	7.13 (2.75)	9.47 (7.44)	10.13 (4.94)	3	1.11	.775
Other physical activity							
6-9 years	6.62 (7.02)	6.53 (2.72)	3.07 (2.52)	9.50 (9.35)	3	11.11	.011*
10-12 years	7.00 (6.73)	6.67 (3.58)	3.00 (2.24)	11.88 (11.41)	3	13.64	.003**
13-15 years	5.38 (5.87)	5.07 (3.47)	3.20 (2.62)	9.88 (8.06)	3	6.68	.083
Total training hours							
6-9 years	17.19 (15.11)	17.85 (9.99)	17.41 (9.37)	20.27 (13.81)	3	1.01	.799
10-12 years	22.63 (16.22)	20.15(10.78)	20.59(10.55)	26.36 (16.66)	3	0.78	.854
13-15 years	23.50 (16.51)	18.65 (9.49)	19.82 (8.22)	25.09 (13.52)	3	1.35	.716

Note. *p < .05, **p < .01; df = degree of freedom; H=X²: Kruskal Wallis test

The only statistically significant between-group differences were in the amount of other physical activities and training at age 6–9 (H(3) = 11.11, p = .011) and 10–12 (H(3) = 13.64, p = .003). The national team players reported significantly less other physical activities and training than the youth national team players at age 6–9 (p = .018) and 10–12 (p = .025) or the Golden Generation players at age 10–12 (p = .006).

Football training and other physical activity

The player groups did not statistically significantly differ in football and other physical activities and training (Table 2). However, football training hours increased throughout childhood and adolescence in all groups and were always higher than the hours spent in other training or physical activity. Of the four groups, the national team players reported the most football training in the first two phases, at ages 6–12, and the Golden Generation players reported the highest other training or physical activity hours during each age phase.

Table 2. Elite players’ practice hours in football and other training, mean (M), standard deviation (SD), and differences between player groups in football and other training (n=51)

	First-tier (n=13)	Youth national team (n=15)	National team (n=15)	Golden Generation (n=8)	df	H	p
	M (SD)	M (SD)	M (SD)	M (SD)			
Football training							
6-9 years	9.75 (8.46)	10.20 (5.29)	12.71 (7.97)	11.64 (6.10)	3	1.90	.593
10-12 years	13.56 (9.69)	12.25 (6.05)	15.82 (9.11)	14.00 (7.50)	3	0.74	.864
13-15 years	17.25 (13.42)	13.95 (6.89)	15.82 (7.68)	15.18 (6.71)	3	0.57	.904
Other training							
6-9 years	7.44 (7.90)	7.65 (5.58)	4.71 (4.04)	8.63 (8.78)	3	2.76	.430
10-12 years	9.06 (9.17)	7.8 (5.61)	4.76 (4.24)	12.36 (10.25)	3	7.23	.065
13-15 years	6.52 (8.02)	4.70 (3.69)	4.00 (3.37)	9.91 (8.32)	3	5.08	.166

Note. *p < .05, **p < .01; df = degree of freedom; H=X²: Kruskal Wallis test

Motivation towards football

As reported in Table 3, the elite footballers scored highest in intrinsic motivation and lowest in amotivation towards football. The strongest positive correlation appeared between the autonomous types of extrinsic motivation, integrated and identified regulation ($r = .69$), which were positively associated with intrinsic motivation. Amotivation was negatively associated with intrinsic motivation, and positively with external regulation.

Table 3. Means, standard deviations, and intercorrelations between the types of motivation in elite footballers (n=51)

	1.	2.	3.	4.	5.	6.
1. Intrinsic motivation	1					
2. Integrated motivation	.41**	1				
3. Identified motivation	.48**	.69**	1			
4. Introjected motivation	.15	.13	.18	1		
5. External regulation	-.26	.10	.00	.05	1	
6. Amotivation	-.37*	-.27	-.14	.18	.31*	1
Mean	4.2	3.6	3.5	3.6	1.6	1.3
Standard deviation	0.7	0.8	0.9	0.6	0.7	0.5

Note. * $p < .05$, ** $p < .01$

Discussion

This study retrospectively investigated early specialization, childhood and adolescent training hours, and the interrelations of different types of motivation in four elite samples of Finnish male footballers: first-tier players, youth national team players (U19, U21), national team players, and Finnish Golden Generation players of the 1990s and 2000s.

On average, and in line with Knapik et al. (2020), the players had started unorganized football training at age five and specialized in football at age 11. Except the youth national players, the amount of organized football practice showed a linear increase throughout ages 6-15. This increase in practice hours might be one reason for the young age of specialization, as it decreases time for other sports. The player-reported practice hours were high compared to those reported in previous studies (Hornig et al., 2016; Knapik et al., 2020). Increasing practice hours also increases physical and psychological load. This in turn might lead adolescent players to clear time for their chosen sport. The increase in practice hours might also result from moving to a bigger club and resulting increased travel time to practice and games. Hence, in future studies, we should also focus on aspects other than the hours spent in training when investigating the reasons for dropping out of other sports when entering the specializing years (Côté, 1999; Côté & Vierimaa, 2014).

Theoretically, our findings support both the hybrid model of specialization of Hendry and Hodges' (2019) and the self-determination theory of Deci and Ryan (2000, 2012) on the benefits of intrinsic motivation. The young age of specialization and the amount of sports and other physical activities and training in the players' childhood and adolescence suggest, as proposed by Hendry and Hodges (2019), that it is possible for elite footballers to invest most of their time in football at an early age while continuing to participate in other sports and physical activities. Although the hours spent in organized training and unorganized practice in other sports and physical activities decreased over time, the players continued to practice in a versatile way during their specializing years. Thus, our findings also accord with those of previous empirical studies (Güllich & Emrich, 2014; Hornig et al., 2016; Knapik et al., 2020) showing that playing multiple sports during childhood supports the careers of future elite footballers.

In accordance with the self-determination theory (Deci & Ryan 2000, 2012), and as expected based on the findings of Hendry et al. (2019), Zeng and Yang (2021), and Zuber et al. (2015), we found that the elite footballers scored highest in intrinsic motivation and lowest in amotivation towards football. The relationship between intrinsic motivation and amotivation was negative, further supporting previous findings on junior football (Calvo et al., 2010; Garcia-Mas et al., 2010).

The limitations of the present study relate to the small sample size the retrospective nature of the study, and the modification made to the motivation scale. The convenience sample of 91 players restricts both our statistical analysis and generalization of the results. The fact that some of the players had to recall practice routines dating back over 30 years, introduces the possibility of retrospective memory errors (Euser et al., 2009). Finally, our decision to shorten the motivation scale to minimize participant load might have affected the reliability of the motivation sum scores and their intercorrelations.

A key strength of this study was the inclusion of several groups of elite footballers of different ages and in different phases in their athletic careers. Research has tended to focus on junior footballers (Calvo et al., 2010; Garcia-Mas et al., 2010), mixed-gender groups (Panagiotis, 2020), and samples with only one or two (Ford et al., 2009) groups of elite footballers. The four groups in the present study covered a very wide cross-section of elite male footballers from Finland, a less developed football country (Szerovay, 2018, p. 25), that has not typically been referred to in the academic football literature. Finnish Golden Generation players, especially, are a very rare elite group who have not been previously studied.

Our study has important practical implications for junior coaching and junior coach education. The findings suggest that it is important for coaches and coach educators to understand that to motivate players to accept a relatively high number of practice hours, football training during the sampling years does not have to be planned and organized, but instead should be fun, as also shown by Zeng et al. (2019). Playing other sports may also enhance individuals' overall enthusiasm towards competing, or, as shown by DiMenichi and Tricomi (2015), improve attention and make for greater sustained effort, factors that might later benefit the chosen sport. A closer look at the quality of practice outside of football-specific training could also contribute to research on footballers' athletic careers.

From the national viewpoint, our study is the first research effort towards understanding the early phases of an elite athletic career in football. Although Finnish football does not as yet have a clear recipe for regularly producing players good enough for European top leagues, we hope that by looking back at the early years of former and current elite players' careers we can provide some ingredients for that recipe.

Conclusion

Our findings suggest that it is important for coaches to be aware of the specialization and motivation dimensions of youth coaching for the players to have the best possible environment to practice. During the sampling and specializing years the young footballers should be offered an environment where their growth of intrinsic motivation is supported in a stable way so that the results of development can be permanent. A permanent change towards stronger intrinsic motivation creates better conditions to develop of a footballers overall potential and sports competence.

It takes a lot for a footballer to reach the top level and in the early years the most important thing is to enjoy every training (Hrcek & Bagl'as, 2018). Quality training that promotes intrinsic motivation supports unorganized practice during early years (Cresswell et al., 2019). Javed et al. (2020) even stated that to rise up to the top at a international level, strong intrinsic motivation is one crucial feature to possess. The development of motivation could be more emphasized in youth sports in both recreational level and especially with competitive groups where it is often taken more or less for granted.

This research recommends that club management should pay attention to their coaches' education opportunities in order to have coaches who have skills, for example, to create psychologically safe learning environments to support the growth of motivation in young players (Blynova et al., 2020). In addition, clubs and coaches should internalize the benefits of multisport-training and bring it into practice. At the moment, research speaks clearly for late specialization especially at team sports, but a general trend of adding up more and more organized practice to even younger players is the way Finnish football clubs have been building towards during the last decade. To achieve this on a really effective level, more specific research is needed on the field of practice patterns of youth athletes aiming to the elite level.

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Disclosure of interest

The authors report no conflict of interest.

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