

**NORWEGIAN FOOTBALL ACADEMY PLAYERS – PLAYER’S SELF-ASSESSED SKILLS, STRESS
AND COACH-ATHLETE RELATIONSHIP**

Abstract

Background: Being part of a football academy environment is associated with many advantages. Even so, academy players will also encounter a range of personal and interpersonal challenges that might affect their development, including stress and the coach-athlete relationship.

Objective: This study's purpose was to investigate how football academy players assessed their own skills compared to their teammates, and how this is associated with perceived stressors and their perceived relationship with their coach.

Method: Participants (N= 122) represented 3 football academies (12-19 years old). Instruments used were CART-Q and a modified version of the Adolescent Stress Questionnaire.

Results: The results showed that the players with high-perceived skill reported a higher amount of self-organized training, more playing time, and a lower level of performance stress compared to the low perceived skill players. The results also indicate that the players perceived they had a close coach-athlete relationship and a low level of stress.

Conclusion: The results suggest that low perceived skill players should receive equitable focus from coaches, especially related to their performance stress.

KEYWORDS: Talent development, Football academies, Stress, Coach-Athlete relationship, Self-assessed skills

Introduction

Becoming an elite soccer player is a challenging and demanding process which requires both talent and an extensive time of deliberate practice over several years (1). In order to foster talented young players, football academies have become an important development arena. Being part of a football academy environment is associated with many advantages, such as; high-level coaches, skilled teammates, and training facilities (2), which often result in increased motivation to continue training for a potential professional career (3). An important part of the development process is the constant skill-assessment that the players face. Such assessments are usually done by expert coaches (4). However, the players' ability to self-assess their own skills, in addition to engage in critical reflection on their training, could be regarded as important parts of the development process (5, 6) in terms of addressing their potential lack of skills. As a result, academy players will encounter a range of personal and interpersonal challenges that might affect their development (7). For example, the players are expected to perform at a high level on a weekly basis, experiencing a high level of pressure. This pressure may be warranted, necessary, and integrated content in the development process to become a more elite player. Even if players are expected to regulate this pressure, a high level of pressure may be a double-edged sword; it can lead to the development of mental toughness and strategies to cope with pressure and stress, but it can also be damaging and hamper the development process, resulting in choking under pressure or potentially withdrawing from competitions.

Even among talented football academy players there are large differences in the players skill level and one could therefore expect the players to assess their own skills accordingly, and this assessment could also be an important part of the further development of these players skills, and play an significant part of their role in the group.

Player self-assessment of skill

An important part of the development process is the constant skill-assessment that the players face in their competitive environment. Such assessments are usually done by expert coaches (4). Coaches could also be introducing a self-fulfilling prophesy in selecting players for their team, which, in turn, affects these players' assessments of their skills and their lack of such skills if they do not get the opportunity to play. This would give the selected players the advantages, since the coach-athlete relationship has been found to enhance mental toughness (8), potentially affecting the athlete's ability to cope with stress (9, 10). However, even if the coach is

the most important supplier of a stable and predictable social environment, the players are also faced with their own expectations. The players' ability to self-assess their own skills, in addition to engage in critical reflection on their training, could be regarded as important parts of the development process (5, 6). It is, however, important to acknowledge the possibility of a social desirability bias when players are assessing their own skills. For example, in a study of young talented football players they found that the youngest players overestimated their own skills compared to their older teammates (11). However, despite a potential bias, the player's feeling will be the same. If you don't feel good enough, it doesn't matter if you are underestimating your skills compared to the coaches' or teammate's perception. The player's feeling will be the same, hence a potential increased stress level in this regard.

Stress

Stress is often defined as an imbalance between the situation and a player's resources (12). The term "stress" has been widely discussed: Fletcher, Hanton, and Mellalieu (13) suggested that stress should represent an overall process incorporating stressors, appraisals, strains, and coping responses. According to Fletcher et al. (13), a stressor is the environmental demand or stimulus encountered by an individual, while strain is defined as an individual's negative response to stressors (e.g., burnout, dropout).

Independent of its definition, stress is experienced at different intensities and durations during adolescence and has different effects on each individual (14), and it seems to increase during the players' adolescence. An example of such stressors could be a player who is coping with a transition into academy football (15), and the fear of failure regarding performance and development (16). Players must learn to cope with stressors if they are to pursue a career in professional sports (9), as failure to cope can lead to decreased performance (17). The stress-recovery balance has been found to be related to injuries and illnesses in youth elite football players (18). It is reasonable to believe that the players could experience the perception of stress differently based on the skill level of the player (1). One could expect the players with the highest skills to experience the highest pressure to perform, and thereby, the highest level of stress. To the contrary, players who are experiencing a lack of mastery could have a high degree of stress because they may not be selected for the playing squad or they may be afraid of losing their place in the academy. This could potentially contribute to reduced well-being (19), hope (20), and player burnout (21, 22). Furthermore, according to Rudolph (23) and Rudolph and Hammen (24), boys seem to experience the most stress in relation to external events. Examples of such external events might be their coach, their teammates, and their performance. A qualitative study of early (12-14 years) and middle adolescent (15-18 years) Premier League Academy players found making errors, team

performance, coaches, and selection to be the most important stressors among the middle adolescent players, while making errors, team performance, opposition, and family were the most important stressors among early adolescent players (1).

Coach-athlete relationship

In the sports context, the coach-athlete relationship plays a central role in the athletes' physical and psychosocial development (25, 26). More specifically, the coach-athlete relationship has been reported to have a significant impact on athlete satisfaction, performance, perceived skill, and self-esteem (27-29). Several research studies have underlined the importance of high quality coach-athlete relationships in reducing stress, performing well, and enjoying competitive experiences (30). Similarly, Rodahl, Giske, Peters, and Høigaard (8) demonstrates that satisfaction with the coach relates positively to mental toughness, with the most important aspect being personal treatment, which subsequently may increase the athlete's ability to cope with stress (9, 10). A study conducted by Lorimer and Jowett (31) revealed the importance of empathic coaches. An empathic coach has a capacity to accurately perceive, from moment-to-moment, the psychological condition of an athlete, such as feelings, mood and motivation behind his/her behaviour. Lorimer and Jowett found that having an empathic coach might have a positive impact on athletes' performance and success, and the authors implied a need for coaches and athletes to work closely together. Jowett and Ntoumanis (32) identified three dimensions in describing the coach-athlete relationship: Commitment, Closeness, and Complementarity. Commitment represents coaches' and athletes' shared perspectives (common goals, values, beliefs) which are developed as a result of open channels of communication. Closeness refers to feeling emotionally close with one another in the coach-athlete relationship. The construct of Complementarity reflects coaches' and athletes' complementarity or co-operative interactions, especially during training (32).

The development of a close and empathic coach-athlete relationship is a long-term process, and it is shaped by the environment in which it unfolds. In team sports, and perhaps especially in a football academy context, there are several challenges that may hinder or hamper the possibility for all players to establish a close and productive coach-athlete relationship. First, coaches in team sports are more likely to interact with the whole group of athletes (i.e., the team), because more focus is on developing the team as a whole, in contrast to individual sports, where the focus is more likely to be individually focused. In addition, in team sports, the group is often larger, and consequently, less time and recourse are available for interactions with each member of the group (33). Lorimer and Jowett (34) found that coaches and athletes demonstrate a better empathic understanding in individual sports compared to team sports. A similar finding is apparent in Rhind et al.'s (33)

study, in which individual athletes were much closer, more committed, and more complementary to their coach than athletes in team sports. Secondly, in a talent academy, the pressure and expectation to develop elite players also embraces the coaches. It is therefore more likely that the coaches will invest more time and interact more closely with some of the players (i.e., most talented) and will also give them more playing time, because the coach believes and expects that their probability of becoming new elite players is greater. Based on this, it may be reasonable to expect that the best players, indicated by the most playing time, may experience a closer coach-athlete relationship than players with less playing time. Furthermore, a close and empathic coach-athlete relationship may also be a significant factor in coping with different stressors in the environment. However, if the quality of the coach-athlete relationship is poor, athletes may not be able to utilize their coaches as a coping mechanism and instead may experience the coach as a new stressor for them.

According to Reeves et al. (1), adolescent athletes in team sports are under-represented within the stress and coping literature, and research in this area is highly recommended. This article will therefore examine football academy players' perceived stress, and coach-athlete relationships, and how they are related to self-assessed skills. More specifically we investigate whether there were differences in perceived stress and the coach-athlete relationship between athletes with high perceived skill, average perceived skill, and low perceived skill.

Materials and Methods

Participants

One hundred and twenty-two Norwegian male youth football players (mean age = 14.0 yrs, *SD* 2.0 yrs) representing two football academies, one top-level club (31%) and one league two club (69%), respectively, were included in the present study. All of the players in both academies participated in this study.

Procedure

The data were collected after a training session in the respective academies following the end of their season. Before answering the questionnaire, all the participants were informed about the purpose of the study, that their participation was voluntary, that the survey was anonymous, and that all information would be treated

confidentially. All players were given an information letter for their parents. The study (ethics clearance) was in accordance and approved by the Norwegian Social Science Data Services.

Instruments

Demographics. The participants were asked five questions about their player Characteristics. They were asked about their age, month of birth on a 4-point scale ranging from 1 = January-March, and 4 = October-December. The participants were asked to rank their playing time in the ended season on a 4-point scale from 1 = *Few of the matches*, 2 = *Some of the matches*, 3 = *Most of the matches*, 4 = *All the matches*. They were also asked about their amount of organized and self-organised training, both on a 7-point scale from 1 = one day a week, to 7 = seven days a week.

Self-assessed skills. The participants rated their skills (technical, tactical, mental, social, and physical) on a 5-point scale ranging from *better than most on my team* (1) to *worse than most on my team* (5). By adding these values together, we obtained a total average rated assessment of the players' skills. Furthermore, the players' assessment of their own skills was divided into three categories: 'High perceived skill' (HPS; the 25% with the highest average score); 'Average perceived skill' (APS; 50%); 'Low perceived skill' (LPS; the 25% with the lowest average score). Such a division of players into three groups has been done previously in a similar study, although this study mostly studied the perceived talent development environment (19).

Stress. The Adolescent Stress Questionnaire is a scale measuring stress among adolescence in general (35, 36), and not related to sport. The adolescent stress questionnaire was therefore a starting point when we developed a 16-item questionnaire related to stress in football (sport) among youths, was developed. As a result, a 16-item football players' stressor questionnaire for the purposes of this study. The introduction to these questions was: "Here are some statements about things or situations that you may experience as stressful. Please tell us how stressful each of these things or situations have been for you over the past year." The items were rated on a 5-point scale: 1 (*Not stressful or irrelevant*); 2 (*A little stressful*), 3 (*Moderately stressful*), 4 (*Quite stressful*), and 5 (*Very stressful*).

The 16 items were subjected to a principal component analysis (PCA) using SPSS version 21.0. Prior to performing the PCA, the suitability of the data for factor analysis was assessed.

Table 1: Principal component analysis (PCA)

Item	Comp 1	Comp 2	Comp 3	Comp 4	Alpha If deleted
Disagreement with your coach	.82				.73
Being evaluated by teammates	.63				.58
Being evaluated by your coach	.60				.40
Match performance		.85			.74
Training performance		.84			.71
Team selection		.76			.85
To keep up in training			.66		.60
Pressure yourself to achieve goals			.45		.58
Coaches' high expectations			.70		.56
Pressure regarding school work				.88	.40
To keep up in school				.74	.47
Not enough time to invest in football				.51	.77
Eigen value	4.73	1.38	1.04	.97	
% of variance explained	39.4 %	11.5%	8.6 %	8.1 %	
Cronbachs α *	.67	.83	.67	.65	

*Cronbachs α for the total scale: .85

Note. Only loadings above .4 are displayed

An inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Keiser-Meyer-Olkin value was .79, exceeding the recommended value of .6, and the Bartlett's test of Sphericity reached statistical significance ($p < .05$), supporting the factorability of the correlation matrix (37). A principal component analysis revealed the presence of four components with an eigenvalue above 1, explaining 39.5%, 11.5%, 8.6%, and 8.1% of the variance, respectively (table 1). All four components were retained for further investigation. To aid in the interpretation of these four components, a Varimax rotation was performed. The four factor solutions explained a total of 67.8% of the variance.

The different factor combinations were labelled as "*Evaluation stress*," indicating stress concerning evaluations of performance by your coach or teammates (i.e., being evaluated by your coach), "*Performance stress*," concerning stress regarding performance in training and matches (i.e., training performance), "*Development stress*," indicating stress concerning expectations for development both from oneself and the coach (i.e., high expectations of coaches), and "*Academic stress*," concerning stress regarding school attendance and lack of time for other activities (i.e., keeping up in school).

An internal consistency test were performed on the four factors (subscales). The test output is a Cronbach's alpha value, which is generally increasing when the correlations between the items increase. The most traditional threshold for a "good" internal consistency is set to Cronbach's alpha > 0.7 . The Cronbach's alpha for each subscale was .68 for *Evaluation stress*, .83 for *Performance stress*, .67 for *Development stress*, and .65 for *Academic stress*. Three of our four subscales are therefore scoring just below the 0.7 threshold. It is,

however, important to acknowledge that an alpha is dependent not only on the magnitude of the correlations among items, but also on the number of items in the scale. For example, a subscale (index) can be made to look more 'homogenous' simply by doubling the number of items, even though the average correlation remains the same. Since the items related to the different subscales theoretically fit each other in the present study, and that the number of items in each subscale is low (3-4 items), all four subscales were created despite three alpha values below 0.7. For further analysis, the three items in each subscale were collapsed into indexes.

Coach-athlete relationship: To measure the players' relationships with their coach, we use the Coach-Athlete Relationship questionnaire (CART-Q) (32). The questionnaire contains an 11-item scale measuring three interpersonal constructs: Commitment, Closeness, and Complementarity. The participants rated how they perceive the quality of the relationship with their coach as follows: Commitment (3 items, e.g., I am committed to my coach), Closeness (4 items, e.g., I like my coach), and Complementarity (4 items, e.g., When I am coached by my coach, I am ready to do my best). The response to each item was based on a 7-point scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly agree*), and the Cronbach's alpha for each subscale was .72 for *Commitment*, .89 for *Closeness*, and .76 for *Complementarity*.

Analysis

All analyses were conducted in SPSS version 21.0. Means and standard deviations were calculated for player characteristics, the four stress components, and the three coach-athlete components. Multivariate analyses of variance (MANOVAs) were used to identify the players' self-assessed skills differences for player characteristics, player stress, and the coach-athlete relationship. Furthermore, a Bonferoni's *post hoc* procedure was applied to assess the mean values between the three self-assessed skills groups (HPS, APS, LPS). The significance level (alpha) was set to .05.

Results

Our results showed no differences between the self-assessed perceived skills groups (HPS, APS, LPS) and age, birth month, and amount of organised training (Table 2). Even so, the players categorised as LPS were somewhat younger (13.4 years), compared to the other groups (HPS, APS). The players categorised with HPS did, however, report a significantly higher amount of self-organised training and playing time during the last season (< 0.05), compared to the APS and LPS players.

The players reported, below the midpoint of 3 on all the four stress components. In preliminary Pearson's r correlation analysis revealed strong positive associations between the four stress components (0.46-0.59, $P < 0.01$). This means that players who are reporting high on one of the stress components systematically reports high on the other stress components. Only stress regarding *performance* was associated with self-assessed skills, as the LPS players reported significantly more stress, compared to the HPS players. The three coach-athlete dimensions, commitment, closeness, and complementarity were all reported as highly above average, with no significant difference between the self-assessed skills categories. A preliminary Pearson's r correlation analysis did also find a strong positive association between the three coach-athlete dimensions (0.53-0.65, $P < 0.01$).

Table 2: Anova analysis

Variables	Scale	25 % HPS ^a Mean (SD)	50 % APS ^a Mean (SD)	25 % LPS ^a Mean (SD)	Between groups F	All Mean (SD)
%		26	49	25		100
Player Characteristics						
Self-assessed skills	1-5 ^b	1.6 (2.6) ^{fg}	2.3 (2.9)	3.0 (2.6)	206.53**	2.3 (0.6)
Age	12-19	14.0 (2.2)	14.3 (2.2)	13.5 (1.6)	1.254	14.0 (2.1)
Birth month	1-12	6.2 (3.5)	6.0 (3.4)	5.8 (3.4)	0.087	6.0 (3.3)
Playing time last season	1-4 ^c	3.9 (0.3) ^{fg}	3.4 (0.8)	3.4 (0.8)	5.387**	3.5 (0.7)
Self-organized training (day/week)	1-7	3.8 (0.8) ^{fg}	3.1 (0.8)	3.1 (0.6)	7.736**	3.3 (0.8)
Organized training (day/week)	1-7	3.9 (1.5)	4.5 (1.6)	3.7 (1.6)	3.473*	4.1 (1.6)
Stress						
Evaluation stress	1-5 ^d	1.9 (0.8)	2.2 (0.8)	2.2 (0.7)	1.259	2.1 (0.8)
Performance stress	1-5	1.9 (0.9) ^g	2.1 (0.8)	2.6 (1.2)	4.523*	2.2 (1.0)
Development stress	1-5	2.1 (0.8)	2.0 (0.6)	2.3 (0.9)	1.164	2.1 (0.8)
Academic stress	1-5	1.8 (0.6)	2.1 (0.7)	2.0 (0.7)	1.261	2.0 (0.7)
Coach – Athlete						
Commitment	1-7 ^d	5.4 (1.1)	5.2 (1.0)	4.8 (1.5)	1.942	5.2 (1.2)
Closeness	1-7	6.5 (0.8)	5.9 (1.3)	5.9 (1.1)	2.260	6.1 (1.2)
Complementarity	1-7	6.3 (0.8)	5.8 (1.0)	5.7 (1.1)	2.520	5.9 (1.0)

* Statistically significant, $P < 0.05$, **statistically significant, $P < 0.01$

^a HPS; High perceived skill, APS; Average perceived skill; LPS; Low perceived skill.

^b 1= better than most on my team, 5 = worse than most on my team

^c 1 = Few of the matches, 2 = Some of the matches, 3 = Most of the matches, 4 = All the matches

^d 1 = Not stressful or irrelevant to me, 5 = Very stressful.

^e 1 = Strongly disagree, 7 = Strongly agree

^f Significantly different than APS (Bonferoni)

^g Significantly different than LPS (Bonferoni)

Discussion

The aim of this article was to examine football academy players' perceived stress, and coach-athlete relationships, and how they are related to self-assessed skills. More specifically we investigate whether there

were differences in perceived stress and the coach-athlete relationship between athletes with high perceived skill, average perceived skill, and low perceived skill.

Self-assessed skills

This study showed that talented academy players' self-assessed skills are related to playing time and self-organised training. These findings are in line with earlier research indicating a connection between the amount of training and skill levels (38). Even so, much of the research claims that it is the amount of organised training, or more specifically, deliberate practice (38), that is the essential factor. However, we did not find any differences between the amount of organised training sessions and skill levels. One obvious reason for this would be that these players are playing on the same team, so the number of hours of organised training is similar among these players, independent of the playing time given to the players. Another aspect is related to the qualitative aspect of deliberate practice. It is reasonable to believe that there is variation in quality and specificity within the relatively broad term deliberate practice, especially when it is measured as organised training among the players. The most highly skilled players may be better at perpetuating their adaption of the training, but also more sensitive, reflective, and self-regulated in their own development process, and thus, better at modifying their level of practice to match their current performance level (39). Research on similar age groups has indicated that athletes who reflect and self-regulate well may benefit more from practice than others (39, 40). In addition, recent qualitative research has found that athletes who have reached the top in their sports take responsibility for their learning (41).

Moreover, self-assessed skills were not related to birth-month, which is somewhat surprising, because the relative age effect is well documented in the literature (see Helsen et al., (42), for a review). This effect has been found to be present among the most talented players, as well as among similarly talented Norwegian players (43). We also found a connection between the amount of playing time the players were given and their self-assessed skills. The more playing time the players were given, the higher they assessed their own skills to be. This could be interpreted that playing time could be just as good of an assessment as the players' assessment of their own skills, indicating the value of a self-assessment of skills (5). One obvious reason is the importance of the coach's evaluation of the players' skills, which ends in the players selected to play in the matches. Furthermore, studies show that the importance of playing time also affects the development of young talented players in terms of muscle strength and sprint ability, and this leads the authors to recommend that coaches incorporate a friendly competitive match in the weekly training cycle of nonstarting players (44). Coaches could therefore be introducing a self-fulfilling prophesy in selecting players for their team, which, in turn, affects these

players' assessments of their skills and their lack of such skills if they do not get the opportunity to play. This would give the selected players the advantages, since the coach-athlete relationship has been found to enhance mental toughness (8), potentially affecting the athlete's ability to cope with stress (9, 10).

Stress

Players who assess themselves as less skilled than their teammates reported a higher level of stress compared to the most skilful players, but only on the performance stress component. This indicates that the players only experience stress regarding their performance level and not about the surrounding components in the environment. Overall, the academy players report low levels of stress regarding the four components measured in this study, despite being part of a highly competitive context with many challenges (15, 21). The reason for the low level of stress might be due to different explanations. One could be that the players find that high expectations are, or should be, normal in this context, and thus, they are not perceived as stressful. Another reason could be due to the age of the players in this study. We must also consider the fact that three of our four subscales measuring stress was just below the acceptable 0.7 value, potentially affecting the results. According to Grant et al. (14), stressors are however experienced at different intensities and durations during adolescence. If we accept the premise that the likelihood of becoming a professional football player lessens slightly as the age of the players increases due to tougher competition, older youth players might experience more stress related to their performance and development. Nevertheless, the finding that the LPS players are more susceptible to stress regarding both performance and team selection, compared to the HPS players, is important knowledge. Furthermore, the players' ability to develop coping strategies (1) could also be important, especially because the research indicates the difficulty of identifying potentially top-level players at an early age (43, 45).

Coach-athlete relationship

Earlier research has found that the coach-athlete relationship plays an important role in the players' physical and psychosocial development (25, 26). More specifically, a good relationship has been proven to be positively associated with a player's satisfaction, performance, perceived skill, and self-esteem (27, 28, 31). The low level of stress found among the academy players examined in the present study could be a result of good coach-athlete relationships. Moreover, one reason for the players to report a high level of Complementarity, Commitment, and Closeness towards their coach could be a result of having highly skilled coaches in highly professional top-level club environments. Ashworth and Heyndels (2) highlighted the advantages of high-level coaches and training

facilities as an essential part of talent development. Interestingly, the present study found no significant differences in the quality of the coach-athlete relationship for players of different levels of self-assessed skills. One could expect that the LPS players would have more imbalance between their resources (skills) and the situation, compared to the HPS players, i.e., the coach's expectations (playing time). A reasonable question would therefore be if the players' expectations of their relationship with the coach are related to their skill levels. For example, a LPS player might have a lower expectation of the coach-athlete relationship, compared to a HPS player. Nevertheless, it is important for coaches to develop a good coach-athlete relationship, independently of the players' skill levels in general, and specifically, for the relatively lower skilled players. This should be regarded as especially important because the research indicates the difficulty of identifying potentially top-level players at an early age (43, 45). Coaches should therefore aim to establish an inviting environment for future development, for example, by reducing the players' strain in training and competition.

Limitations of the study and future research

The authors acknowledge that the present study has some limitations. This is a study of 122 Norwegian youth academy players with ages ranging from 12 to 19. One should be aware of this before generalising the present study's results. Furthermore, the measurements used in the present study are explorative and have not been validated in earlier studies. Thus, the choice of developing, assessing, and analysing new measurements was done with the aim of contributing to a better understanding of football academy players. The stress measurement is also a limitation in this study, since the Cronbach's alpha was beneath the 0.7 threshold considered acceptable. The authors also acknowledge that only player data are included in the present study, and they recommend that future research also should include the coaches' perspective. The study was conducted at the end of the season, which could mean the period where the players perceive the least stress during the season. Moreover, it is important to acknowledge that stress is a dynamic situation, constantly in change. A cross-sectional design, which is the case in the present study, will not take this in to consideration. Therefore, we suggest more studies on stress in young talented football players with a longitudinal design. These changes in the design could offer vital information on the development process from both the player and coach perspectives.

Conclusion

This study found that the HPS players reported a higher amount of self-organised training, a higher degree of playing time, and a lower level of performance stress compared to the LPS players. Overall, the academy players reported a low level of stress on all four components and seem to have a good coach-athlete relationship.

Because football academies are highly competitive environments (7), they are largely dependent on offering stable environments for their players. Based on this fact, our results suggest that coaches should focus on the LPS players, especially related to their performance stress.

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