

Position- and age group-specific study on the
characteristics of junior footballers involved in
the Hungarian elite education

Abstract of PhD thesis

István Csáki

University of Physical Education

Doctoral School of Sport Sciences



Supervisor: Dr. habil. József Bognár, associate professor, PhD

Co-supervisor: Dr. habil. Gábor Géczy, associate professor, PhD

Official evaluators:

Prof. Dr. Tamás Szabó, private professor, CSc

Dr. Lukasz Trzaskoma, Uniqua Sopron, PhD

President of the Complex CDE Board:

†Prof. Dr. Csaba Istvánfi, rector emeritus, CSc

Members of the Complex CDE Board:

Dr. Ákos Tóth, associate professor, PhD

Prof. Dr. Károly Ozsváth, college professor, PhD

Budapest

2017

1. INTRODUCTION

Football can be regarded as the most popular one of all sports in the world; it is known and played by every nation around the globe. It is partly owing to this extreme popularity and the immense economic power that is present in football that the standards of football climb increasingly higher from month to month in the world. In today's top football, the game is becoming faster and more enjoyable, which calls for outstanding psychic, motor and sport-specific skills on the players' side. With the acceleration and tactical evolution of the game, physical expectations also develop dynamically, and one is to accept that not all the players are able to perform continuously well under such pressure and stress. It is not sufficient for footballers to have excellent human biological characteristics, motoric and sport-specific skills, but the high-standard presence of such psychic and mental capabilities is similarly crucial as the lack of anxiety, proper conflict management, self-confidence and sport motivation, while in football an important aspect of success is the role of pedagogic factors that are inherent

in football, for instance in the form of the appropriate trainer–player relationship.

For this reason, it is essential that experts should work out a measuring and testing system that is potentially suitable for the measurement of the performance of footballers, the tracking of their development.

2. OBJECTIVE

Research goals

The goals of my research include

- ✓ the demonstration of the pedagogic factors, that is the topics of selection and the choice of sport, the analysis of the criteria of becoming a successful footballer, as well as the examination of the trainer–player relationship;
- ✓ the discussion of the values of psychic properties, that is the sport motivational level of the studied football players, their perceived motivational orientation, the level of their coping strategies and the values for competition/match-related anxiety;

- ✓ the presentation of the body composition values of the players involved in the study;
- ✓ the demonstration of the current level of the motoric and sport-specific factors;
- ✓ the explanation of conclusions drawn on the basis of the results of my study to see whether the tests can be applied to the selection process of footballers and the measurement of the various factors of football talents;
- ✓ the discussions as to which studied variables make distinction between accomplishing and non-accomplishing football academy students.

Hypotheses

Hypotheses relating to the study of pedagogic aspects:

(H₁): I have assumed that there are differences among the values for the various positions with respect to the background factors of choosing football;

(H₂): I have assumed that there are differences among the values of the various positions in terms of the background factors of talent management (what factors the footballer considers to have contributed to his successes);

(H₃): I have assumed that there are differences among the values of the various positions in terms of the tasks and roles of the trainer when the trainer–player relationship is concerned;

Hypotheses relating to the study of psychic properties:

(H₄): I have assumed that footballers can be described as having high levels of internal motivation, and that there are differences among the sport motivation values of footballers playing in different positions;

(H₅): I have assumed that the motivational climate in football can be described as a task-oriented environment, and there are significant differences among the perceived motivational climates and positions;

(H₆): I have assumed that with respect to coping strategies there are statistically detectable differences among the positions;

(H₇): I have assumed that with respect to the values of anxiety there are significant differences among the positions.

Hypotheses relating to the human biological and motoric studies:

(H₈): I have assumed that in the case of the variables of body composition measurement there are significant differences among the positions;

(H₉): I have assumed that in the case of the general motoric and sport-specific test results there are differences among the representatives of the various positions.

Hypotheses relating to the evaluation of positions and age groups:

(H₁₀): I have assumed that the tests and assessments applied during the studies are suitable for distinguishing the different age groups;

(H₁₁): I have assumed that the tests and assessments applied during the studies are suitable for distinguishing the different positions;

Hypotheses relating to the study of accomplishment:

(H₁₂): I have assumed that there are differences between accomplishing and non-accomplishing footballers in view of the measured variables.

3. METHODS

Studied sample

My research focused on the assessment of certain age groups (U16 (n=79), U17 (n=68), U18 (n=65), U19 (n=46)) at Hungary's five major academies, junior football centers. Therefore, after data cleansing and the screening of extreme values, altogether 258 junior footballers educated at these academies (n=258) were assessed in my study. During the expert sampling procedure, the principal criterion was to select the sampling location so that football academies from the western, central and eastern part of Hungary should be involved alike.

The footballers studied during the research were basically categorized in four groups with respect to their positions in the field: goalkeepers (n=33), defenders (n=88), midfielders (n=80) and forwards (n=57).

In the studied sample, all such footballers were considered to be accomplishing who had already had at least one official international match in Hungary's junior international teams, or had played at least once as Hungary's international players in team "A", or had had

at least a debut in Hungary's League 1 or League 2 in an adult championship match. In consequence, altogether 91 (n=91) accomplishing (B) and 167 (n=167) non-accomplishing (NB) footballers were involved in the assessment.

Methods of the research

Measurement of pedagogic aspects:

A pedagogic questionnaire with closed-ended questions where players were asked to determine on a scale from 1 to 5 how much they agreed with various statements. The questionnaire was associated with the background factors of their choice of sport and selection, the process of talent management and the quality of trainer–athlete relationship.

Measurement of psychological characteristics:

- Sport motivation: Sport Motivation Scale
- Perceived motivational climate: Perceived Motivational Climate in Sport Questionnaire
- Coping strategies: Athletic Coping Skills Inventory
- Anxiety: Competitive State Anxiety Inventory-2

Measurement of human biological characteristics:

Body weight, body height, body mass index, muscle mass, fat mass, body fat percentage

Measurement of motoric and sport-specific skills:

Fastness: 5-meter, 10-meter, 30-meter sprint tests

Endurance in fastness: YoYo IRL1 test

Explosive strength: Standing long jump

Agility: Illinois agility test without and with ball

Data processing

The data processing and data analysis procedures needed for the demonstration of the results were carried out with the use of the SPSS 21.0 Statistical Program.

For the characterization of the sample, descriptive statistics were used, the differences among the age groups and positions were presented with reliance on the one-way ANOVA test (PostHoc), accomplishing and non-accomplishing players were compared with the help of the 2-sample t-test, while for the anticipation of belonging to either group discriminant analysis was conducted.

The significance levels were set at the 5% error margin that is the most frequently used in social scientific

researches ($p < 0.05$), and error margin values under 1% were interpreted as strong significance levels.

4. RESULTS

Results for the pedagogic aspects

In the light of the opinions of the studied players, the "popularity of the sport" showed a high value on the average. The role of the trainer is important in terms of the background factors of selection, because a number of players started to play football, because the trainer took notice of them. Another important aspect is that the studied persons selected this sport consciously, meaning that they wanted to become footballers by all means.

According to the players, the role of the family is crucial in the achievements they have made so far. The players attribute their achievements to their own mental abilities (perseverance, attitude), whereas they tend to associate minor roles to the professional team they work with, the competences of trainers or the conditions provided by the club.

In the light of the players' opinions, it is also important that the trainer should be helpful in issues

associated with their private lives. The answers given by the players suggest that the trainer should act as a good teacher who orients and educates, as well as as a professional "role model". In addition to being professionally prepared in sports, the trainer is further expected to have pedagogic skills in order to become successful in his own field of expertise.

Results for the psychological characteristics

With respect to internal motivation, the values of the U18 age group were the highest (5.36 ± 0.83), while for external motivation U16 players recorded the lowest average (4.59 ± 0.49). For all age groups, the lack of motivation reflected a very low value, where the U17 average was smaller (1.28 ± 0.56). The values in the subscale for fear of making mistakes proved to be highest in the case of the U19 age group (3.11 ± 0.60) and the smallest for the U17 category (2.80 ± 0.52). Subscales for inequalities in recognition and rivalry within the team similarly brought about the highest values for the U19 age group (3.23 ± 0.92 ; 3.59 ± 0.71). In the case of the EGO main scale ($F=3.13$; $p<0.05$), fear of making

mistakes ($F=2.80$; $p<0.05$) and inequality in recognition ($F=4.97$; $p<0.01$), there were significant differences among the age groups, and the U19 age group seemed to be significantly distinct from all the other age groups.

Studying the coping strategies of the assessed footballers, I experienced that for the subscale of coping with shocks goalkeepers and defenders had the highest values (3.12 ± 0.64 ; 3.12 ± 0.82).

Cognitive and somatic anxiety was found to be the highest for forwards (1.73 ± 0.49 ; 1.61 ± 0.41), whereas goalkeepers had the highest values for self-confidence (3.17 ± 0.72). Significant differences were reflected in the comparison of the values for the various positions in the case of the cognitive anxiety subscale, where forwards could be distinguished from defenders and goalkeepers in their values ($F=3.86$; $p<0.05$).

Results for human biological characteristics

With respect to the total number of elements, goalkeepers were found to have the largest weights and heights (72.57 ± 6.33 ; 182.19 ± 11.24). On the average, the body weight of midfielders was the smallest. The average

value for the body fat mass proved to be highest for goalkeepers (6.81 ± 2.45), whereas the smallest figures were observed for defenders (6.08 ± 2.14). Statistically detectable, significant differences were established for variables measured in the case of body weight ($F=6.94$; $p<0.01$), body height ($F=7.08$; $p<0.01$) and muscle mass ($F=7.11$; $p<0.05$).

Results for the motoric and sport-specific skills

Looking at the motoric and sport-specific test results of the the assessed footballers, I found that the fastest category in the 30-meter sprint was the group of forwards (4.27 ± 0.32), whereas goalkeepers proved to be slowest (4.34 ± 0.18). Goalkeepers achieved the best results for standing long jump (240.19 ± 25.12), while midfielders proved to be the weakest in this respect (229.67 ± 28.34). On the other hand, the best performance in the yo-yo endurance tests was shown by midfielders (2479.5 ± 325.14). In the case of the agility test with ball, the most outstanding results were associated with forwards (15.18 ± 0.65), whereas midfielder proved to be the fastest in completing the field test (19.32 ± 1.26).

Significant differences were found between the agility field tests when executed without ball ($F=4.39$; $p<0.01$) and with ball ($F=15.55$; $p<0.01$).

Comparison of the performances of accomplishing and non-accomplishing players

This study has found no significant differences between accomplishing and non-accomplishing players, because the members of both groups have undergone the same selection system, and been given the same training for long years. Although the human biological properties of the accomplishing players are more favourable, and on the average their motoric and sport-specific abilities are better, significant results distinguishing the two groups cannot be observed.

When the results of the successful and less successful players were examined for the individual positions and age groups, it could be found that the measured variables did not lead to differences, meaning that the indicators of the anticipation of success should be sought elsewhere, but not among the measured indicators.

5. CONCLUSIONS

Results for the pedagogic aspects

I have assumed (H_1) that there are differences among the values for the various positions with respect to the background factors of choosing football. This assumption has not proved to be correct, because there was only one case observed when statistically detectable differences could be seen among the positions, i.e. in the case of the responses to the statement that the players wanted to become footballers by all means.

I have assumed (H_2) that there are differences among the values for the various positions with respect to the background factors of talent management. Since significant differences were found only on two occasions when the answers belonging to the various positions were compared, this assumption has not proved to be true. I have assumed (H_3) that there are differences among the values of the various positions in terms of the tasks and roles of the trainer when the trainer–player relationship is concerned. As significant differences could be identified in the responses for the trainer acting in a motivating,

encouraging and managing role among the various positions, this hypothesis has not proved to be correct.

Results for the psychological characteristics

I have assumed (H₄) that footballers can be described as having high levels of internal motivation, and thought that there are differences among the sport motivation values of footballers playing in given positions. The internal motivation values of the studied footballers were high, but with respect to sport motivation differences could not be found among the various positions, meaning that this hypothesis should be dismissed, too.

I have assumed (H₅) that the motivational climate in football can be described as a task-oriented environment, and there are significant differences among the perceived motivational climates and positions. Based on the perceived motivational values of the assessed elite junior age footballers, it can be claimed that the players are primarily task-oriented, which can be explained by the high values in the subscales of the TASK main scale, and consequently this hypothesis has been correct.

I have assumed (H_6) that with respect to coping strategies there are statistically detectable differences among the positions. While studying the coping strategies of footballers, it turned out that the comparison of the various positions did not bring about significant differences among the measured variables, and as a result this hypothesis has not proved to be correct.

I have assumed (H_7) that with respect to the values of anxiety there are significant differences among the positions. The positions reflected significant differences only in the case of the cognitive anxiety scale, and therefore my hypothesis proved to be correct just in part.

Results for human biological characteristics

I have assumed (H_8) that in the case of the variables of body composition measurement there are significant differences among the positions. During the analysis of the variables, significant differences were found in three cases among the positions, and therefore this assumption has been found to be well-grounded only in part.

Results for the motoric and sport-specific skills

I have assumed (H_9) that in the case of the general motoric and sport-specific test results there are differences among the representatives of the various positions. Among the measured variables, significant differences during the comparison of the various positions could be demonstrated in the Illinois agility tests without and with ball, and consequently this hypothesis has been partly justified. The values relating to the results of goalkeepers in the agility field test differed significantly from those of all the other positions.

Distinction of positions and age groups based on the performed tests

I have assumed (H_{10}) that the tests and assessments applied during the studies are suitable for distinguishing the different positions. As the positions could be distinguished from each other in the case of three subscales of the psychic properties (cognitive anxiety, fear of making mistakes, inequality of recognition), as well as four variables in the human

biological, motoric and sport-specific tests (Illinois agility, body weight, 5-meter sprint, 10-meter sprint), my hypothesis has proved to be correct in part.

I have assumed (H_{11}) that the tests and assessments applied during the studies are suitable for distinguishing the different age groups. Factors that were suitable for distinguishing the age groups included three subscales from the psychological properties (lack of anxiety, amotivation, objective) alongside six variables with respect to the human biological, motoric and sport-specific tests (BMI, 30-meter sprint, 5-meter sprint, Illinois agility, body weight, Illinois agility test with ball), and therefore my hypothesis has proved to be correct in part.

Evaluation of the hypothesis relating to accomplishment

I have assumed (H_{12}) that there are differences between the values of successful and less successful players when the measured variables are concerned. Having compared the values for accomplishing and non-accomplishing players, I found that with respect to the applied measurements no statistically detectable,

significant differences could be observed, and therefore I have dismissed this last hypothesis.

LIST OF PUBLICATIONS BY THE AUTHOR

1. Vincze G, Bognár J, **Csáki I**, Géczi G (2011) A labdarúgás szakmai elitje a sportág helyzetéről, fejlődési lehetőségeiről. *Kalokagathia*, 49(2-4): 277-288.
2. Tóth J, ifj, **Csáki I**, Tóth J (2012) The Examination of the 4:4 game at diamond and square. *Studia Universita Babeș-Bolyai Educatio Artis Gymnasticae*, 57(1): 89-99.
3. Zalai D, **Csáki I**, Bobák P, Hamar P. (2013) Elméletek a XXI. századi labdarúgó-sérülésekről, prevencióról és a teljesítményt befolyásoló tényezőkről. *Magyar Sporttudományi Szemle*, 14(4 (56)): 44-49.
4. Révész L, **Csáki I**, Bognár J, Selmei B, Márkus E, Tóth L. (2013) Pszichés tényezők vizsgálata válogatott triatlonversenyzőknél. *Magyar Sporttudományi Szemle*, 14:(4 (56)):19-27.

5. Révész L, Bognár J, **Csáki I**, Trzaskoma-Bicsérdy G. (2013) Az edző-sportoló kapcsolat vizsgálata az úszás sportágban. Magyar Pedagógia, 113(1): 53-72.
6. Benczenleitner O, Bognár J, Révész L, Paksi J, **Csáki I**, Géczi G. (2013) Motivation and motivational climate among elite hammer throwers. Biomed Hum Kinet, 5(1): 6-10.
7. **Csáki I**, Bognár J, Révész L, Géczi G. (2013) Elméletek és gyakorlatok a tehetséges labdarúgó kiválasztásához és beválásához. Magyar Sporttudományi Szemle, 14(1 (53)): 12-18.
8. **Csáki I**, Bognár J, Trzaskoma-Bicsérdy G, Zalai D, Mór O, Révész L, Géczi G. (2013) A sportágválasztás, a tehetséggondozás és az edző-sportoló kapcsolat vizsgálata elit utánpótláskorú labdarúgók körében. Magyar Sporttudományi Szemle, 14(3 (55)): 9-16.
9. Révész L, Biró M, **Csáki I**, Horváth T, Patócs Á, Kállay É, Balázs R, Tóth L. (2014) The Hungarian adaptation of the perceived motivational climate in sport questionnaire-2 (h-pmcsq-2). Cogn Brai Behav/Cogni Cre Comp, (3): 175-190.

10. **Csáki I**, Géczi G, Kassay L, Déri D, Révész L, Zalai D, Bognár J. (2014) The new system of the talent development program in Hungarian soccer. *Biomed Hum Kinet*, 6(1): 74-83.
11. Zalai D, Pánics G, Bobák P, **Csáki I**, Hamar P (2015) Quality of functional movement patterns and injury examination in elite-level male professional football players. *Act Physio Hun*, 102(1): 34-42.
12. Kiss Z, Fózér-Selmeci B, **Csáki I**, Bognár J. (2015) Bentlakó labdarúgó-korosztályok pszichés-mentális jellemzői. *Mentálhigiéné és Pszichoszomatika*, 16(4): 331-347.
13. **Csáki I**, Fózér-Selmeci B, Bognár J, Szájer P, Zalai D, Géczi G, Révész L, Tóth L. (2016) Új mérési módszer: Pszichés tényezők vizsgálata a Vienna Test System segítségével labdarúgók körében. *Testnevelés, Sport, Tudomány*, 1(1): 8-20.
14. Fózér-Selmeci B, Nagy E, **Csáki I**, Tóth L, Bognár J. (2016) Labdarúgó-akademisták pályán betöltött pozíciójához szükséges pszichológiai készségek vizsgálata és elemzése számítógépes pszichológiai

tesztrendszerrel (Vienna Test System). *Alkalmazott Pszichológia*, 16(3): 97-115.

15. **Csáki I**, Szakály Zs, Fózer-Selmeci B, Kiss Z, Bognár J. (2017) Psychological and Anthropometric Characteristics of a Hungarian Elite Football Academy's Players. *Physical Culture and Sport Studies and Research*, 73(1): 15-26.