Structure of Talent and Individual Sports Profiles in Late Childhood

Kandráč Róbert¹*
Čech Pavol²
Dzugás Dalibor³
Kačúr Peter⁴
Perič Tomáš⁵
Balint Gheorghe⁶*

¹,²,³,⁴ University of Presov, Ul. 17. novembra 15, Prešov, 08001, Slovak Republic
⁵ Charles University, José Martího, Prague 6, 15800, Czech Republic
⁶ „Vasile Alecsandri“ University of Bacău, Calea Marasesti 157, 600100, Romania

DOI: 10.29081/gsjesh.2018.19.1.01

Keywords: motor abilities, testing, primary education

Abstract

The purpose of the study was to determine individual profiles of sports preconditions in 6- and 7-year-old children and recommend sports according to test scores and individual sports profiles. Data were collected from 1st graders at elementary schools. The children participated in organized sports practice in sports clubs. The sample included 42 boys and 3 girls. Of these, 16 children engaged in soccer practice and 29 children engaged in ice hockey practice. Children performed 10 motor tests (Měkota & Blahuš, 1983; Šimonek, 2015): repeated routing with a stick, flexed arm hang, standing long jump, shuttle run Agility test, 20-meter sprint, endurance shuttle run, sit-ups, sit-and-reach test, and rolling-of-three-balls test. To assess decision-making processes, children played a flag chasing game. The results of the correlation analysis showed that correlations among tests were similar for both groups. The individual sports profiles that were applied to determine the appropriateness of sports preconditions for particular sports showed that sports children played and sports for which children showed talent differed considerably.

1. Introduction

Sport national governing bodies as well as elite sport clubs invest considerable resources to identify young talented athletes who have the potential to excel in specific sport contexts (Cobley et al., 2012; Till et al., 2017; Vaeyens et
Hirose-Seki (2016) and Reilly et al. (2000) classified four essential key stages by which athletic growth is achieved among elite athletes: detection, identification, selection, and development of talent.

Lots of coaches suggest that research efforts should be transferred from talent identification and detection to talent development in the most appropriate learning environment to realize this potential (Durand-Bush & Salmela, 2002; Reilly et al., 2000). Furthermore, many national federations continue to invest considerable resources to identify exceptionally gifted youngsters at an early age to accelerate the developmental process (Morris, 2000).

Breitbach et al. (2014) and Gagne (1996) point out further important fact that it is crucial to differentiate between giftedness and talent. Giftedness was defined as exceptional competence in one or more domains of ability. Therefore, talent identification is the process of recognizing these gifted participants with the potential to excel in a sport (Suppiah et al., 2015). On the other hand, talent was described as exceptional performance in one or more fields of human activity developing from these domains of abilities considering the presence of relevant environmental and personality factors. Therefore, talent development like providing the most appropriate learning environment to realize this potential plays a crucial role in the pursuit of excellence (Vaeyens et al. 2008; Williams-Reily, 2000).

Various instances of research distinguish three lines of knowledge regarding talent identification and development. Considering the first one, being a sports champion is implicit in the genetics of each person as the predominance of certain genes in an individual and it would enable athlete to succeed in a specific sport (Magallanes, 2011). Phillips et al. (2010) and Starkes et al. (1996) emphasize an environmental perspective, advocating that expertise is acquired as performers specialize at an early age and engage in deliberate practice.

Some of researchers have neglected the role of the environment and focused on organism structure and process in isolation (Phillips et al., 2010; Yarrow et al., 2009). Defenders of the second line say that sporting success is achieved through years of practice and repeated training. Both areas of knowledge generate an ongoing debate among field experts and professionals about whether a sports champion is born or made (Magallanes, 2011).

The third line of knowledge merges the two previous and accepts the importance of the genetic potential of an athlete which through a process of carefully planned and structured training would enable an athlete to achieve the highest sporting level in a specific sport discipline (Quijada, 2016). Integration of polar perspectives on sports performance and expertise into a multidisciplinary approach is according to Philips et al. (2010) way how to enhance understanding of the athlete–environment relationship as dynamical system. This approach should be supported by studies of complex system behavior during match play and competitions, decision-making, motor-learning, coordination etc.

The systems, models and programs designed to identify and provide for the development of talented young people in sport continue to evolve in their
complexity and comprehensiveness, often driven by national interests of doing well in sport (Cooke et al., 2010).

The athletes must be selected from the crowd, and this selection is achieved through talent identification programs based on certain criteria. These criteria are designed to reflect key skills that project the potential of a young person on his athletic performance in adulthood (Breitbach et al., 2014). Although the criteria have been subjected to multidisciplinary research and detailed discussion, the optimal test design for a reliable prediction of talent has not yet been found (Breitbach, 2014; Davids et al., 2013; Hohmann, 2001).

This study was supported by grant project VEGA 1/0997/16 “The structure of talent as a determinant underlying evaluation of sports preconditions”.

2. Material and methods

The sample included 6- and 7-year-old children who were 1st graders at elementary schools. The children included in the study engaged in organized sports practice in a soccer and ice hockey clubs, respectively. Of 46 children, 42 were boys and 3 were girls. To determine the individual profiles of sports preconditions, children performed 10 motor tests in December 2017 and January 2018. Testing sessions took place in the sports academies of Tatran Prešov (n = 16) and PSK Arena Prešov (Boys: n = 26, Girls: n = 3). Children who participated in the study engaged in two exercise sessions per week, 60 minutes each. The somatic parameters measured included body height and body weight. The sports preconditions were tested by administering 10 motor tests (Měkota & Blahuš, 1983; Šimonek, 2015): repeated routing with a stick, flexed arm hang, standing long jump, 4 x 10 m shuttle run, 20-meter sprint, endurance shuttle run, sit-ups, sit-and-reach test, and rolling-of-three-balls test. To assess the quality of the decision-making processes, children played a flag chasing game called pull-the-flag game.

To determine methods for the assessment of children’s motor preconditions, we decided to address the issue in two stages:

1. To determine variables that form the criterion of "preconditions for sports" – structure of talent;
2. To establish individual sports profiles.

During the first stage, an expert commission was set up to propose factors and variables in order to define the criterion of "sports preconditions". The commission comprised five experts in talent identification whose knowledge was based on individual and group interviews. The group interviews provided the definitions of basic areas of motor preconditions. When assessing particular options of evaluating motor preconditions, the commission decided to focus on four factors that included physical conditioning, technique, tactics, and body build. Specific domains included the assessment of object control skills and decision-making processes. The administered tests were selected according to their degree of reliability and validity in relation to the assessed criterion. Testing yielded data about the levels of particular motor abilities.
During the second research stage individual sports profiles were established. These profiles had to correspond with the demands related to the structure of sports performance in particular sports. The profiles were established by using two relevant indicators. When assessing the structure of individual sports profiles for particular sports, we took into account the structure of sports performance as defined by individual sports associations and federations.

As regards the data processing, raw scores were converted to a 10-point scale. The 10-point rating scale was used to establish individual profiles for particular sports. Subsequently, the test score achieved by a concrete child was compared with the deviations from the particular scales for each type of sport. These deviations were squared and summed to calculate the absolute values. The results included also highly relevant variables (multiplied by coefficient). On the other hand, two non-relevant indicators were excluded from the results. The lowest sum was used to establish order in individual sports and sports games. Each child was recommended three individual sports and three sports games for which the child has the best sports preconditions.

Based on the assessment of normality of the data distribution using the Shapiro-Wilk test (unpublished data), we used parametric methods and characteristics of mathematical statistics for further analysis. The descriptive statistics included the mean as the measure of central tendency and the standard deviation and standard error of mean as the measures of variability.

To determine differences in test scores between groups depending on sports specialization (ice hockey vs soccer), we used the \( t \) test for independent samples at \( p < .05 \).

Correlation analysis between the indicators of performance in tests was carried out using the Pearson’s correlation coefficient (\( r \)). The strength of the association was defined according to Evans et al. (1996), when \( r < 0.19 \) represents very low, \( r < 0.39 \) low, \( r < 0.59 \) moderate, \( r < 0.80 \) strong and \( r \geq 0.80 \) very strong association between the variables. Data were analysed statistically using Statistica, v.13.0, software (StatSoft, Inc.; Tulsa, USA).

### 3. Results and Discussions

Significant differences in test scores depending on sports specialization are presented in Table 1. Significant differences between sports were found for body height only \( (p < .05) \). The results showed no significant effects of engaging in physical activities, regardless of sport. Significant differences between test scores achieved by children engaged in soccer and ice hockey practice, respectively, were found for two motor tests: routine with a stick and flexed arm hang. These tests assess levels of motor coordination and upper-body strength. Children who participated in ice hockey sessions showed significantly higher levels of manipulative skills.
Table 1. Statistical analysis of differences between sport-specific groups

|       | N  | Mean | SD  | F    | Sig. | t    | Sig. |
|-------|----|------|-----|------|------|------|------|
| BH (cm) | G1 | 29   | 123.4 | 4.88  | 0.003 | 0.958 | 2.544 | 0.016 |
|       | G2 | 16   | 119.5 | 5.03  |       |      |      |      |
| BM (kg) | G1 | 29   | 24.2  | 3.08  | 0.335 | 0.566 | 1.749 | 0.087 |
|       | G2 | 16   | 22.4  | 3.93  |       |      |      |      |
| 20 m sprint (s) | G1 | 29   | 4.9   | 0.46  | 0.559 | 0.459 | -0.904 | 0.371 |
|       | G2 | 16   | 4.7   | 0.35  |       |      |      |      |
| RTB (s) | G1 | 29   | 31.5  | 8.14  | 0.345 | 0.560 | -2.929 | 0.005 |
|       | G2 | 16   | 38.6  | 7.14  |       |      |      |      |
| RRS (s) | G1 | 29   | 31.4  | 8.00  | 3.529 | 0.067 | -0.126 | 0.901 |
|       | G2 | 16   | 31.8  | 13.44 |       |      |      |      |
| SAR (cm) | G1 | 29   | 5.5   | 5.49  | 0.559 | 0.459 | -0.904 | 0.371 |
|       | G2 | 16   | 7.3   | 8.17  |       |      |      |      |
| FAH (s) | G1 | 29   | 5.9   | 4.03  | 0.931 | 0.340 | -2.607 | 0.013 |
|       | G2 | 16   | 9.4   | 4.96  |       |      |      |      |
| SLJ (cm) | G1 | 29   | 114.4 | 18.51 | 0.361 | 0.551 | -0.490 | 0.627 |
|       | G2 | 16   | 117.0 | 14.39 |       |      |      |      |
| SRA (s) | G1 | 29   | 14.3  | 1.03  | 0.803 | 0.375 | 0.238 | 0.813 |
|       | G2 | 16   | 14.2  | 1.30  |       |      |      |      |
| SU (no.) | G1 | 29   | 20.8  | 7.99  | 0.061 | 0.806 | -1.593 | 0.119 |
|       | G2 | 16   | 24.6  | 7.42  |       |      |      |      |
| ESR (s) | G1 | 29   | 180.3 | 74.73 | 0.383 | 0.539 | 0.726 | 0.472 |
|       | G2 | 16   | 164.8 | 54.59 |       |      |      |      |
| CTF (no.) | G1 | 29   | 7.6   | 3.11  | 2.658 | 0.110 | -0.131 | 0.896 |
|       | G2 | 16   | 7.8   | 6.73  |       |      |      |      |

Legend *

BH - body height, BW - body weight, RRS - repeated routine with a stick,
FAH - flexed arm hang, SLJ - standing long jump, SAR - shuttle run agility test,
SU - sit-ups in 1 minute, RTB - rolling of three balls, SRA - sit-and-reach,
ESR - endurance shuttle run, PTF - pull the flag, G1 - ice hockey players.
G2 - soccer players.

As shown in Table 2, correlation analysis revealed significant correlation for both children engaging in soccer and ice hockey practice, respectively. Correlations were assessed in five domains: speed (20-meter sprint, shuttle run agility test), strength (flexed arm hang, sit-ups, standing long jump), manipulative skills and motor coordination (rolling of three balls and repeated routine with a stick), flexibility (sit-and-reach test), and decision making (pull-the-flag game). There were no significant correlations between tests that assess object control skills and motor coordination. However, significant correlations were found between tests that assess speed. Test scores in sit-up test significantly correlated with the 20-meter sprint test in both groups of children.
Children who participate in ice hockey practice showed significant correlations between speed and object control skills, which reflects the demands of the game. Children who participated in soccer practice showed significant correlations between flexibility and motor coordination tests that required certain range of movement for proper execution.

Table 2. Correlation analysis for particular motor tests

| BH | BM | 20 m sprint | RTB | RRS | SAR | FAH | SLJ | SAR | SU | ESR | PTF |
|----|----|-------------|-----|-----|-----|-----|-----|-----|----|-----|-----|
| BH |    | .757**      | -   | -.325 | -   | .056 | .022 | .171 | .138 | .148 | .276 | .285 | .021 | .252 |
| BM |    | .811**      | -   | -.309 | .085 | .118 | .010 | .108 | .138 | .222 | .282 | .037 | -    | -    |
| 20 m sprint |    | .750**      | .518 | -.295 | .269 | .276 | .145 | .298 | .222 | .640 | -    | -    | -    | -    |
| RTB |    | .391**      | .207 | .623** | -   | .227 | .418 | .013 | .179 | .257 | .155 | .363 | .235 | -    |
| RRS |    | -.139       | .199 | .209 | .197 | .400 | .512 | .079 | .470 | -    | .369 | .245 | .166 | -    |
| SAR |    | -.307       | .438 | -.086 | .032 | .234 | .032 | .256 | .353 | -.093 | .309 | .073 | -    | -    |
| FAH |    | .252        | .065 | .178 | .358 | .099 | .296 | .109 | .400 | -    | .030 | .114 | .039 | -    |
| SLJ |    | .199        | .088 | -.351 | .572 | .048 | .375 | .362 | .526 | -.317 | -.035 | .341 | -    | -    |
| SRA |    | .413        | .360 | .647** | .611 | -.277 | .248 | .362 | .534 | -.195 | .428 | -    | -    | -    |
| SU |    | .286        | .039 | -.761** | .434 | .107 | .331 | .086 | .317 | .501 | -    | .312 | .266 | -    |
| ESR |    | .459        | .377 | -.480 | .396 | .098 | .103 | .073 | .136 | .607 | -.479 | .234 | -    | -    |
| PTF |    | .250        | .010 | -.496 | .586 | .119 | .184 | .035 | .535 | .537 | .368 | -    | -    | -    |

*Legend
BH - body height, BM - body mass, RRS - repeated routine with a stick, FAH - flexed arm hang, SLJ - standing long jump, SAR - shuttle run agility test, SU - sit ups in 1 minute, RTB - rolling of three balls, SRA - sit-and-reach test, ESR - endurance shuttle run, PTF - pull the flag, *p < .05, **p < .01.

As shown in Table 3 that shows data for young soccer players, children who participated in the study did not show preconditions or the sport of soccer but predominantly for rhythmic gymnastics. As for the second individual sport, children showed specific and appropriate motor preconditions for other sports, especially gymnastics and ice skating. Low number of children showed preconditions for track and field, which requires versatility based on a variety of skills.
Table 3. Recommended sports and games for children who participate in soccer practice

| 1st sport          | 2nd sport          | 1st game     | 2nd game     |
|--------------------|--------------------|--------------|--------------|
| Rhythmic gymnastics| Ice skating        | Volleyball   | Handball     |
| Track and field - jumps | Track and field - sprints | Handball   | Ice hockey   |
| Rhythmic gymnastics| Artistic gymnastics| Handball     | Ice hockey   |
| Ski jumping        | Rhythmic gymnastics| Handball     | Ice hockey   |
| Cross-country skiing | Rhythmic gymnastics | Volleyball   | Ice hockey   |
| Rhythmic gymnastics| Ice skating        | Volleyball   | Tennis       |
| Rhythmic gymnastics| Ski jumping        | Tennis       | Volleyball   |
| Rhythmic gymnastics| Track cycling      | Volleyball   | Tennis       |
| Rhythmic gymnastics| Artistic gymnastics| Volleyball   | Tennis       |
| Rhythmic gymnastics| Cross-country skiing | Tennis   | Volleyball   |
| Ski jumping        | Rhythmic gymnastics| Volleyball   | Tennis       |
| Rhythmic gymnastics| Ski jumping        | Ice hockey   | Volleyball   |
| Rhythmic gymnastics| Cross-country skiing | Handball   | Ice hockey   |
| Rhythmic gymnastics| Track cycling      | Volleyball   | Ice hockey   |
| Cross-country skiing | Track and field - endurance | Floorball | Tennis       |
| Rhythmic gymnastics| Ice skating        | Handball     | Ice hockey   |

For the team sports, one of which the children have taken up, the most recommended sport is the sport of volleyball. This shows that children should take up a different sport for which the talent they are endowed with is needed. An interesting finding is that no child showed predominant predispositions for soccer itself but rather for ice hockey, which, according to the results, may become their second sport to pursue.

As shown in Table 4 that shows data for young ice hockey players, children who participated in the study did not show preconditions or the sport of ice hockey but rather for a variety of different sports. As for individual sports, not games, 16 children showed specific and appropriate motor preconditions for rhythmic gymnastics, which is in contradiction with the demands of the sport of ice hockey, which requires other preconditions. As far as the sports specialization is concerned, just one child demonstrated skills and preconditions necessary for playing ice hockey. The most recommended sports games for children who specialized in playing ice hockey were volleyball and soccer. The number of children who were recommended to play ice hockey as their second sport increased to three, which is
contrary to the idea of individual sports profiles. The most recommended 2nd sports were track and field events, rhythmic gymnastics, and ice skating.

**Table 4. Recommended sports and games for children who participate in hockey practice**

| 1st sport                        | 2nd sport                        | 1st game  | 2nd game |
|----------------------------------|----------------------------------|-----------|----------|
| Track and field - endurance      | Cross-country skiing             | Floorball | Volleyball|
| Cross-country skiing             | Mountain biking                  | Soccer    | Volleyball|
| Track and field - Jumps          | Rhythmic gymnastics              | Soccer    | Volleyball|
| Rhythmic gymnastics              | Cross-country skiing             | Soccer    | Handball |
| Cross-country skiing             | Rhythmic gymnastics              | Soccer    | Handball |
| Track and field Jumps            | Ice skating                      | Ice hockey| Tennis   |
| Rhythmic gymnastics              | Track and field - endurance      | Volleyball| Tennis   |
| Rhythmic gymnastics              | Cross-country skiing             | Soccer    | Volleyball|
| Rhythmic gymnastics              | Track and field Jumps            | Volleyball| Tennis   |
| Track cycling                    | Track and field Jumps            | Tennis    | Volleyball|
| Ice skating                      | Track and field Jumps            | Handball  | Ice hockey|
| Rhythmic gymnastics              | Track cycling                    | Floorball | Volleyball|
| Rhythmic gymnastics              | Cross-country skiing             | Soccer    | Ice hockey|
| Rhythmic gymnastics              | Ski jumping                      | Soccer    | Handball |
| Rhythmic gymnastics              | Ski jumping                      | Volleyball| Tennis   |
| Cross-country skiing             | Mountain bike racing             | Soccer    | Volleyball|
| Rhythmic gymnastics              | Track and field Endurance        | Soccer    | Volleyball|
| Rhythmic gymnastics              | Artistic gymnastics              | Volleyball| Handball |
| Ski jumping                      | Rhythmic gymnastics              | Volleyball| Tennis   |
| Rhythmic gymnastics              | Ice skating                      | Volleyball| Tennis   |
| Rhythmic gymnastics              | Ice skating                      | Volleyball| Floorball|
| Ski jumping                      | Track and field Endurance        | Tennis    | Volleyball|
| Ski jumping                      | Rhythmic gymnastics              | Volleyball| Tennis   |
| Ice skating                      | Rhythmic gymnastics              | Tennis    | Volleyball|
| Rhythmic gymnastics              | Ski jumping                      | Volleyball| Tennis   |
| Rhythmic gymnastics              | Ice skating                      | Volleyball| Tennis   |
| Ice skating                      | Track and field - Jumps          | Handball  | Volleyball|
| Rhythmic gymnastics              | Ice skating                      | Volleyball| Handball |
| Rhythmic gymnastics              | Ski jumping                      | Volleyball| Ice hockey|
4. Conclusions

The purpose of the study was to determine individual profiles of sports preconditions in 6- and 7-year-old children and recommend sports according to children’s test scores and individual sports profiles. The results showed no significant effects of engaging in physical activities, regardless of sport. Significant differences between test scores achieved by children engaged in soccer and ice hockey practice, respectively, were found for two motor tests: routine with a stick and flexed arm hang. These tests assess levels of motor coordination and upper-body strength. There were no significant correlations between tests that assess object control skills and motor coordination. However, significant correlations were found between tests that assess speed. Test scores in sit-up test significantly correlated with the 20-meter sprint test in both groups of children. The results of this study are useful in determining the level of sports preconditions in relation to the type of sports recommended to children according to their abilities and skills.

References

1. BREITBACH, S., TUG, S., & SIMON, P. (2014). Conventional and genetic talent identification in sports: will recent developments trace talent?, *Sports Medicine, 44* (11), 1489-1503;
2. COBLEY, S., BAKER, J., & SCHORER, J. (2012). *Identification and development of sport talent: international perspectives*, Routledge, London, UK;
3. COOKE, C., COBLEY, S., TILL, K., & WATTIE, N. (2010). Searching for sporting excellence: talent identification and development. *British Journal of Sports Medicine, 44* (66), supplement 1;
4. DAVIDS, K., ARAUJO, D., VILAR, L., & PINDER, R. (2013). An ecological dynamics approach to skill acquisition: implications for development of talent in sport, *Talent Development and Excellence, 5* (1), 21-34;
5. DURAND-BUSH, N., & SALMELA, J.H. (2002). The development and maintenance of expert athletic performance: perceptions of World and Olympic Champions, *Journal of Applied Sport Psychology, 14* (3), 154-71;
6. GAGNE, F. (1997). Critique of Morelock’s (1996) definitions of giftedness and talent, *Roeper Review, 20* (2), 76-85;
7. HIROSE, N., & SEKI, T. (2016). Two-year changes in anthropometric and motor ability values as talent identification indexes in youth soccer players, *Journal of Science and Medicine in Sport, 19* (2), 158-162;
8. HOHNMANN, A. (2001). Leistungsdagnostische Kriterien sportlichen Talents - dargestellt am Beispiel des leichtathletischen Sprints, *Leistungssport, 31* (4), 14-22;
9. KEVIN, T., MORLEY, D., O’HARAA, J. et al. (2017). A retrospective longitudinal analysis of anthropometric and physical qualities that associate
with adult career attainment in junior rugby league players, *Journal of Science and Medicine in Sport*, 20 (11), 1029-1033;
10. **MAGALLANES**, C. (2011). La heredabilidad en las ciencias del deporte: entendidos y malentendidos, *Universitaria de Educación Física y Deporte*, 4 (4), 13-19;
11. **MĚKOTA**, K., & **BLAHUŠ**, P. (1983). *Motorické testy v tělovýchově*, Státní Pedagogické Nakladatelství, Praha: Czech Republic;
12. **MORRIS**, T. (2000). Psychological characteristics and talent identification in soccer, *Journal of Sport Science*, 18 (9), 715-726;
13. **PHILLIPS**, E., **DAVIDS**, K., **RENSHAW**, I., & **PORTUS**, M. (2010). Expert performance in sport and the dynamics of talent development, *Sports Medicine*, 40 (4), 271-283;
14. **QUIJADA**, M.R. (2016). Is the Successful Athlete Born or Made? A Review of the Literature, *Apunts. Educació Fisica i Esports*, 123 (1), 7-12.
15. **REILLY**, T., **WILLIAMS**, A.M., **NEVILL**, A., & **FRANKS**, A.M. (2000). A multidisciplinary approach to talent identification in soccer, *Journal of Sports Sciences*, 18 (9), 695-702.
16. **STARKES**, J.L., **DEAKIN**, J.M., **ALLARD**, F. et al. (1996). The road to excellence: the acquisition of expert performance in the arts and sciences sports and games, Ericsson, K.A, (ed.) *Deliberate practice in sports: what is it anyway?*, US: Lawrence Erlbaum Associates, 81-106;
17. **SUPPIAH**, H.T., **LOW**, CH.Y., & **CHIA**, M. (2015). Detecting and developing youth athlete potential: different strokes for different folks are warranted, *British Journal of Sports Medicine*, 49 (13), 878-882;
18. **ŠIMONEK**, J. (2015). *Testy pohybových schopností*, Slovakia: Pandan, Nitra;
19. **VAEYENS**, R., **LENOIR**, M., & **WILLIAMS**, A.M., Pandan, Nitra: **PHILIPPAERTS**, R.M. (2008). Talent identification and development programmes in sport: current models and future directions, *Sports Medicine*, 38 (9), 703-714;
20. **WILLIAMS**, K., & **REILLY**, T. (2000). Talent identification and development in soccer, *Journal of Sport Science*. 18 (9), 657-667;
21. **YARROW**, K., **BROWN**, P., & **KRAKAUER**, J.W. (2009). Inside the brain of an elite athlete: the neural processes that support high achievement in sports, *Nature reviews: Neuroscience*, 10 (8), 585-96;