THE STRUCTURE OF ONTOGENETIC DISPOSITIONS IN YOUNG VOLLEYBALL PLAYERS – EUROPEAN CADET VOLLEYBALL CHAMPIONS

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ABSTRACT

Purpose. Proper multi-level selection of talented youth is one of the fundamental aspects of qualified sport. The common autotelic approach to selection in sport, based on the measurement of individual traits and abilities and excluding any pragmatic aspects of different sports seems highly insufficient today. Each specific sport features its own factors affecting athletes' development and constituting important selection criteria. Thus, a heterotelic approach accounting for the specificity of different sports allows ontogenetic profiling of young talented athletes in view of their dispositions to act under varying circumstances. Basic procedures. The presented theoretical model of holistic perception of playing dispositions was verified by way of interdispositional identification of candidates for the Polish national team, who after a two-year training won the European championship in cadet volleyball. Main findings. The data obtained showed that each player featured a specific structure of traits and abilities understood as volleyball playing dispositions. It is assumed that individual dispositions can be – under different circumstances and to a different extent – combined into more complex structures called interdispositions. Conclusions. The exemplification of the theoretical model showed that playing dispositions could and should be studied in an interdisciplinary manner. The holistic approach to the player’s individual traits makes his or her profiling more comprehensive, which affects the development of skills and performance assessment methods.

Key words: volleyball, talents, dispositions, interdispositions

Introduction

Modern qualified sport involves constant improvement of effectiveness of the process of athletes’ training and obtaining high sport results. The modern scientific and technological development allows this process and facilitates solving practical problems in sport.

One of the most fundamental issues in contemporary sport is the search for the most effective means of selection of future athletes. The process of selection should account for proper differentiation between athletes and correct identification of the most outstanding candidates for further training leading to the championship level.

A number of earlier studies concerning selection in sport [1–3] focused on the so-called “championship model” for particular sports. By way of observations and examinations of sport champions the authors defined athletes’ major traits and qualities. They assumed that achieving the critical values of the “championship model” was necessary and entirely sufficient to ensure success in sports competition. This assumption can be accepted in some sports, e.g. individual sports, but not in team sports, where cooperation and interaction in changing situations as well as social and organizational effects are involved. The championship model approach excludes the phenomenon of “equifinality” thanks to which players with different structures of traits, abilities and talents achieve similar sports results.

Ontogenetic identification of children and adolescents with abilities or talents for sports from the autotelic standpoint has been subject to numerous research studies in the areas of anthropomotorics or psychology [4–10]. According to Panfil [11], if significant correlations between a trait or ability and effectiveness of action are observed, then such traits or abilities are understood as dispositions to practice a given sport (Fig. 1).
The holistic model of sport playing dispositions

The understanding of factors conditioning the achievement of objectives in a team game is possible with the aid of a number of relatively isolated sciences (each featuring its own axiology, research methodology and language). However, sciences which do not make up for a synergy of knowledge, fail to yield a multi-factor analysis of player’s actions. Thus, an interdisciplinary and systemic approach seems more reasonable. Such an approach, according to Panfil [11], relies on the cooperation of representatives of different sciences on the model of mutual relationships between playing dispositions and situations during a game, which indicate the player’s skills to act. The model of playing interdispositions, based on the player’s individual traits and abilities displayed in changing game situations was suggested by Superlak [12] (Fig. 2).

Adopting Panfil’s postulates of praxeology of sports games [13] two concepts: dispositions and interdispositions can be applied. Since the player’s body is a coherent, complex and dynamic entity, the player’s particular ontogenetic dispositions can form an interdisposition. According to Panfil [13] interdisposition is an arrangement of interrelated ontogenetic dispositions, which leads to formation of a new quality, which is not a mere...
direct sum of the constituent dispositions. Interdisposi-
tions are formed through internal synergic effects relat-
ed to players’ psychophysical capabilities.

On the basis of existing research literature as well as
the author’s own long-term coaching and research expe-
rience an original model of identification of volleyball
playing dispositions was developed, which accounted
for the holistic approach to factors conditioning playing
skills. The aim of the study was to exemplify a theoreti-
cal model based on the identification of individual dis-
positions of young volleyball players who won the Eu-
ropean Cadet Volleyball Championship.

Material and methods

The research sample consisted of 12 volleyball play-
ers, aged 15 years, who had been selected for the Polish
national team (out of 1500 candidates from all over Po-
land), following a two-year training and a multi-stage
selection process. Considering the specificity of volley-
ball as well as the level and range of specific player’s
skills conditioned by the player’s structure of ontoge-
netic dispositions, the national team coach made partic-
ular players take the positions of setter, center and re-
ceiver.

The following tests were used for identification of
the young volleyball players’ dispositions:
• somatic features – body height (cm), body mass (kg),
one-arm’s reach in a standing position (cm) and two-
arm reach in a standing position (cm);
• fitness test – running jump with one arm up (cm),
standing jump with both arms up (cm), dynamic
force – overhand 3-kg medicine ball throw, speed
test – 10-m run (s), locomotive speed – running with
a direction change (envelope run) (s);
• coordination skills test – speed of psycho-motor re-
sponses to visual signals [13];
• test of specialist knowledge [14]; test of intellectual
potential [15].

The tools for measurement of somatic parameters
and fitness, which have been used for research for sev-
eral years, were selected by a team of outstanding vol-
leyball experts appointed by the Department of Train-
ing of the Polish Volleyball Association. They were
standardized using the precise descriptions of measure-
ment conditions and tests.

The low, average and high results of different varia-
bles (measured on different scales) were compared us-
ing standardized results. The results with higher than
average values (above one or two standard deviations)
have been set in bold in Tab. 1.

Table 1. Ontogenetic profiles of 15-year-old volleyball players – candidates for the Polish national cadet volleyball team

<table>
<thead>
<tr>
<th>Traits and abilities</th>
<th>Receivers</th>
<th>Centers</th>
<th>Setters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body height (cm)</td>
<td>187</td>
<td>188</td>
<td>187</td>
</tr>
<tr>
<td>Body mass (kg)</td>
<td>77</td>
<td>70</td>
<td>74</td>
</tr>
<tr>
<td>Rohrer’s index</td>
<td>1.13</td>
<td>1.05</td>
<td>1.13</td>
</tr>
<tr>
<td>One-arm’s reach (cm)</td>
<td>248</td>
<td>252</td>
<td>242</td>
</tr>
<tr>
<td>Two-arm reach (cm)</td>
<td>246</td>
<td>247</td>
<td>238</td>
</tr>
<tr>
<td>Running jump (cm)</td>
<td>330</td>
<td>321</td>
<td>317</td>
</tr>
<tr>
<td>Standing jump (cm)</td>
<td>306</td>
<td>295</td>
<td>302</td>
</tr>
<tr>
<td>Jumping ability (running) (cm)</td>
<td>82</td>
<td>69</td>
<td>75</td>
</tr>
<tr>
<td>Jumping ability (standing) (cm)</td>
<td>60</td>
<td>48</td>
<td>64</td>
</tr>
<tr>
<td>Dynamic force of shoulder girdle muscles (m)</td>
<td>8.5</td>
<td>7.9</td>
<td>9.4</td>
</tr>
<tr>
<td>Envelope run (s)</td>
<td>13.89</td>
<td>15.15</td>
<td>14.54</td>
</tr>
<tr>
<td>10-m run (s)</td>
<td>1.78</td>
<td>1.77</td>
<td>1.61</td>
</tr>
<tr>
<td>Psychomotor response time (s)</td>
<td>19.78</td>
<td>9.16</td>
<td>17.08</td>
</tr>
<tr>
<td>Test of specialist knowledge (%)</td>
<td>39.54</td>
<td>40.08</td>
<td>28.2</td>
</tr>
<tr>
<td>Answer time of specialist knowledge (min)</td>
<td>5.54</td>
<td>5.08</td>
<td>5.2</td>
</tr>
<tr>
<td>Test of intellectual potential</td>
<td>100</td>
<td>85</td>
<td>115</td>
</tr>
<tr>
<td>Answer time of intellectual potential test (min)</td>
<td>10.35</td>
<td>7.1</td>
<td>8.27</td>
</tr>
</tbody>
</table>

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Results

Empirical verification of the theoretical model

The young players under study were characterized in terms of their volleyball playing dispositions and skills in the somatic, motor and intellectual spheres. Each player featured a compilation of dispositions and abilities constituting specific ontogenetic structures. Only in the case of somatic structure did all subjects feature a leptosomatic body build. All the centers featured above the average body height, which is a basic criterion of selection for players in this particular court position (Tab. 1).

The results obtained show that the majority of subjects (eight players) featured a high level of specialist knowledge, but only few (two players) reached high results in the test of intellectual potential. Apart from the variables mentioned above the main factors affecting the players’ intellectual potential include the speed of situation assessment and decision making: above the average task-solving times were obtained by four players (specialist knowledge test) and one player (intellectual potential test), respectively.

In accordance with the theoretical model, it can be noted that better than average results obtained by the young volleyball players constitute their playing dispositions, whereas the relationships between them constitute playing interdispositions determining the level of action play displayed by the European champions.

Each subject featured a certain number of individual variables at a level better than average, which can be classified as somatic, fitness and intellectual. Using a qualitative ordering of the variables under study and their correlations the following interdispositions were identified: somatic-intellectual, fitness-intellectual and somatic-fitness-intellectual.

In two cases the individual variables constituted the same disposition category. The dispositions with better than average values (above one standard deviation) can be considered to be a somatic-intellectual interdisposition (Tab. 2–4).

Discussion

The foundation of good selection in sport is seeking – using rational criteria – young people holding promise of their effective development of skills and abilities. Each sport requires specific traits and abilities which significantly determine the development of top level athletes. Thus the process of ontogenetic identification of young athletes should involve a heterotelic approach aimed at a multi-level selection of the most talented individuals from the vantage point of a given sport.
Somatic features and motor skills required in volleyball have been subject to a number of research studies [12, 16–18]. Klocek and Zak [19] propose that the main factors determining effectiveness of action in volleyball are speed-strength abilities and speed abilities. It is highly significant that the results of numerous studies on selection of players in volleyball have been used in the volleyball coaching practice in Poland.

Any action during a game involves a conscious or spontaneous choice of alternatives based on the player’s intelligence and the level of specific knowledge about the game [20] which improves with the player’s sport experience [21]. Miedzińska [22] in her study proposed a correlation between reaction time and the level of general intellectual ability. According to her, “faster” individuals feature a higher IQ than “slower” ones. A similar observation was made by Nęcka [23], who revealed that more intelligent people featured a greater speed and volume of information processing. These results show that reaction time can be a significant indicator of better intellectual capacity. A player’s level of specialist knowledge about the game as well as his or her experience gained during competition affect, according to Naglak [24], the development of a specific perception which enables the player’s functioning in dynamic and constantly changing situations during the game. The perception of a situation is based on such intellectual functions as understanding, anticipating, assessing and concluding.

The proposed model of holistic approach to volleyball playing dispositions was verified in the process of ontogenetic identification of young volleyball players who won the European championship in cadet volleyball. Using Panfil’s praxeological criteria of interdisciplinary ontogenetic assessment of athletes [11], the volleyball players were characterized in view of playing interdispositions. The results obtained show that young, talented volleyball players feature diverse structures of dispositions, which may form interdispositions being synergic effects of correlations of different individual traits and abilities.

Conclusions

The interdisciplinary methodology used in research of ontogenetic determinants affecting the development of special skills is appropriate. The holistic approach to ontogenetic dispositions of individual players with diverse ranges and levels of skills and abilities validates the phenomenon of equifinality in sport. Equifinality still requires a proper didactic approach, but it must not be ignored in the process of training talented individuals.

References


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