A Focus on Action Speed Training

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Recent analyses of major international events (ECh, WCh and Olympics) have been highlighting the fact that European top teams have further developed their execution of the game. This, however, has not involved highly obvious changes such as new tactical concepts and formations but, more importantly, minor steps including

- more fast breaks in the game and efficient exploitation of opportunities arising from such breaks,
- active, variable defence action with small, fast steps, frequently culminating in recovery of the ball as well as
- a larger number of attacks in each game with shorter preparation times and faster execution.

Underlying all these tendencies in game development is higher playing speed and faster action as exhibited by teams from Africa and Asia. This style of playing has more recently also been encouraged by the IHF through its rule revisions (e.g. fast throw-off and early warning for passive playing).

Training activities taking into account these new developments will therefore include the following aspects in the future:

- quicker perception and information processing, also on the part of those playing without the ball,
- greater demands made on legwork to support flexible defence action,
- speed-driven application of attack techniques and
- improvements in switching from defence to attack and from attack to defence.

From demands being made by the game ...

As a first step in making our players faster it is helpful to take a close look at and analyse the demands being made on speed in the game. From this analysis, we can then develop the general components of a *basic methodological formula for speed-driven training*. Such a basic formula will enable us to develop new forms of training, or to modify existing play and practice schemes by a new emphasis on speed.

The complex demands being made on speed in handball are summarised by the term "action speed", which is defined by BÖTTCHER/HÖNL (1996, 40) as follows: "Action speed is the complex ability to effectively perform technical and tactical action in a game with precision and as required in a given situation with maximum intensity, within the best possible time". Training the complex ability of action speed is therefore a more comprehensive task than was realised in the past, as Fig. 1 shows.

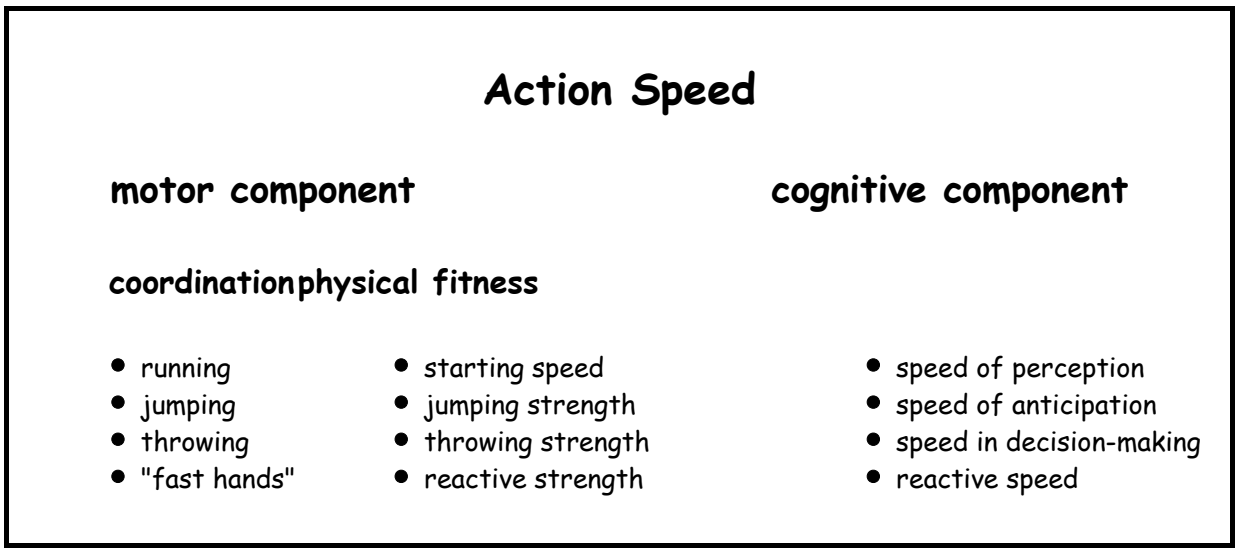

Fig. 1: Action speed components (according to BÖTTCHER/HÖNL 1996, 40)

Earlier treatments of this subject in handball literature discussed "speed training" mainly in terms of those aspects of running that are observed in handball: starting speed, acceleration, running lengths of between 5m and a maximum of 30m (in fast breaks), possibly combined with a change in direction.

Areas that were neglected included all types of fast movements executed by arms and hands that improve throwing techniques, throwing force (quick follow-through, "whip") and variability and that, at the same time, are also of key significance in offensive ball-driven defence play when, for example, intercepting or blocking passes or dribbling the ball away from opponents.

Because of the many situations and movements in handball in which fast action is possible and called for, motor co-ordination is also a prime factor. A 100m-runner also needs a stable, highly specific type of co-ordination to get to the finish with maximum speed. This quality, however, is different from the more flexible co-ordination exhibited by a handball player, who should be able to quickly run forwards, backwards and sideways while using his arms for additional tasks (catching, passing, dribbling, defending). These moves, which need to be co-ordinated, may have to be executed simultaneously and/or sequentially. They

are never identical to situations encountered in the past, but always dependent on current events in the game and the opponent's conduct.

Therefore, an additional demand is being made: The handball player, who is running fast and moving his arms fast must, at the same time, watch what is happening in the game, perceive relevant information ("key signals" such as moves made by team mates, opponents and the ball), anticipate how the game will develop (what team mates and opponents are planning to do) and respond by taking appropriate action in a given situation ("decide on an objective and an action programme", i.e. take a shot at the goal or continue playing; take a classical pass or a jump shot at the goal). These cognitive processes (perception and processing of information) have to unfold at a very fast rate as, otherwise, the player may react too late and the opportunity for a surprise shot may be lost.

... **to the basic methodological formula** ...

Now, a *basic methodological formula for speed-driven training* is to be developed based on the description of the demands made on players by the game. The underlying idea is that there are no speed drills specific to handball, i.e. drills that would train just speed and nothing else. Instead, it is assumed that handball training should always emulate real conditions as closely as possible while using targeted control - so-called *modelling* of training drills (see BOIKO 1990) - for specific emphasis. Such specific emphasis is created by applying the basic methodological formula (as described by ROTH 1998, 9 et seq.) which describes contents (movements, techniques, actions) and specific conditions in general terms.

To date, basic methodological formulas have been developed for

- general co-ordination training: "simple movements + difficult conditions",
- handball-specific co-ordination training: "simple techniques + difficult conditions",
- technical training: "complex movements + simplified conditions",
- general fitness training: "simple movements + controlled application of physical strain" and
- handball-specific training of will-power: "complex actions + difficult conditions"

(see. *Handball-Handbuch* Vol. 1 and Vol. 2, BRACK/BUBECK/PIETZSCH 1996, 4 et seq. , FEDDERN 1990, 19 et seq. and FELDMANN, 1995).

For a better understanding of these basic formulas note the following definitions:

- ***Movements*** are motor activities of a general type such as running, hopping, jumping, pulling, climbing, rolling, etc.;
- ***Techniques*** are isolated playing skills such as dribbling, catching, passing, throwing and (within limits) faking;
- ***Actions*** are technical and tactical moves with the aim of solving a real problem in a game, e.g. different types of throws in the face of active defence, or one-on-one action chains in one-on-one situations.

As, basically, all actions during a game may be speed-driven, the first component of the basic methodological formula for speed-driven training is "movements, techniques or game-specific actions".

Unfortunately, the basic methodological formulas named above distinguish only between simple or difficult conditions and do not provide for any further differentiation. ROTH (1998, 8 et seq.) distinguishes (following NEUMAIER/MECHLING 1995 and TE POEL/NEUMAIER 1995) between the following six conditions of motor pressure: time pressure, precision pressure, complexity pressure, organisation pressure, stress pressure, and variability pressure. From the speed perspective, the first three pressures defined in Fig. 2 appear to be of particular importance. Combined with the first component (see above) they yield the basic formula (Fig. 3). The third component in the methodological formula must come from situations providing special motivation for speed-driven handball training. The coach must continuously offer new and exciting challenges and organise practice sessions so that players are encouraged to use maximum effort and dedication.

Time pressure:	**Problems requiring time minimisation, optimisation and/or speed maximisation**
Variability pressure::	**Problems requiring players to cope with changing environments / situations**
Komplexitätsdruck:	**Problems requiring players to deal with a large number of successive demands**

Fig. 2: Different types of pressures used in speed-driven training (according to ROTH 1998, 8)

Training action speed

=

movements, techniques or game-specific actions

+

time, variability and/or complexity pressure

+

motivating challenges / situations

Fig. 3: Basic methodological formula for speed-driven handball training

A close look at this basic formula reveals that its elements mirror the components of action speed (see Fig. 1):

- Movements under time pressure correspond to the motor / physical fitness component;
- Movements or techniques executed under complexity or variability pressure correspond to the motor / co-ordination component;
- Movements, techniques or actions executed under time, complexity and/or variability pressure correspond to the cognitive components of action speed.

Nevertheless it must be underlined at this point that the transitions between the activities described and the situational conditions cannot be clearly defined.

... to ways of exercising control in training sessions

The basic methodological formula offers a general approach that must now be filled with content. Before this can be done, the following questions have to be answered:

1. What types of movements, techniques and actions are of particular significance in handball?

2. How do I create time, variability and complexity pressure?

The options and methodological tricks with which the speed element can be incorporated into training sessions are derived primarily from the answers given to the second question. A summary of "fast" movements, techniques and actions may nevertheless prove helpful:

- Movements: running forwards, backwards and sideways; vertical and horizontal jumps forwards, backwards and sideways, including changes of direction and turns, summarised under the term "stepwork training";

- Techniques: defensive techniques using legs and arms/hands (e.g. snatching balls, intercepting passes, blocking passes and shots); dribbling with the right hand and the left hand, changing hands, direction and speed, and perception tasks summarised under the term "dribbling drills"; catching/passing and throwing;

- Actions: all individual actions in defensive and offensive play, in one-on-one situations without and with the ball (e.g. running to a free space, offering oneself to circumvent blocks, obstruction of running and passing paths, breaking through with fakes when the running path is blocked and players are being followed; taking shots against blocks), summarised under the term "action chains"; switching from defence to attack and vice versa, summarised under the term "transition".

Of the pressure conditions named, time pressure is considered the central control option in action speed training sessions; however, a controlled creation of time pressure requires great sensitivity on the part of the coach. For optimum training of action speed, the problem posed by the coach should be such that it can only just be solved by the player with close to maximum effort. If the player believes, at the start or in the course of a drill that a successful solution of the problem is not or no longer possible, he will no longer use his best effort.

It is only in the second step that "creating time pressure" means solving a problem within the shortest possible time; in the first step, it means to allow as little time as possible for perceiving the problem in a practice session or a game! The later the player is able to perceive the relevant information (key signals), the less time he has for preparing and executing his actions. The cognitive component of action speed (perception - anticipation - decision-making - reaction) is controlled by giving incomplete or late information (Where is the ball; where are the opponents and the team mates? What is my/our objective; what the opponent's? What is my role/function, what are my team mates

doing?). Control measures that may be used in creating time pressure are outlined in Fig.4.

Create time pressure by:

- **making perception more difficult through incomplete information**
  e.g. obstructing view by soft mattress
- **making perception more difficult through information overload e.g. several throwers start running but only one takes a throw**
- **making perception more difficult by allowing only a short time for perception**
  e.g. precede it by high-intensity exercise (one-on-one situations without a ball)
- **varying rules**
  e.g. limit or ban bouncing and dribbling
- **assigning tasks and roles at a late point**
  e.g. transition games
- **setting deadlines/limits**
  e.g. finish attack after a fixed time or number of passes

Fig. 4: Control measures to create time pressure

Variability pressure and complexity pressure are two situational pressure conditions relating primarily to training motor-co-ordination and the cognitive component of action speed. Adaptation of movements, techniques and actions to specific situations in a game and to the current actions of the opponent (= variability) and the need for having an action followed immediately by another (=complexity) - e.g. one-on-one situation followed by a pass to a team mate, then run to free space or, after completion of an attack, assume immediately a defensive task - can be achieved in the widest sense by designing training sessions so that they come as close as possible to the real game. Potential control options are listed in Figures 5 and 6.

Create variability pressure by:

- **varying, constantly changing defensive behaviour**
  e.g. offensive, defensive, anticipatory

- **open situations**
  e.g. gain possession of the ball and then play one-on-one

Fig. 5: Control measures creating variability pressure

Creating complexity pressure by:

- **two-phase drills including a sequence of several actions**
  e.g. stepwork drills followed by a throw or one-on-one

- **extended, *multi-dimensional* individual actions**
  e.g. playing in small groups towards two goals

Fig. 6: Control measures generating complexity pressure

Apart from the use of control measures, additional general guidelines must be noted in developing and improving action speed:

1. Do not build speed only by measures aiming at physical fitness!
2. Design training sessions to equally address all components of action speed!
3. Train action speed as specifically for handball as possible and in as many competitive situations as possible!
4. The demands made in training sessions must be determined by the players' skills level: making high demands on cognitive abilities makes sense only if players are able to meet the technical requirements!
5. Train motor action speed (physical fitness and/or co-ordination) at the beginning of a training session; use complex cognitive training contents in the main or final part of a session!
6. Less is more: be sure to allow adequate breaks between repetitions and series!