# EVALUATION OF SPEED-TESTS FOR PLAYERS OF SPORT GAMES

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## PROBLEM:

The characteristic demands of the load of the common sport games are different, but many similarities are obvious. They all require a high **ability of** anticipation, reaction- and action s@. Many actions like dribbling, feint, tracing and **attacking** adversary are carried out with highest intensity **(speed)** in combination with rapid changes in direction of motion. In split seconds decisions between alternative movements must be reached and go into action.

The available speed-tests were not able to satisfy these requirements **(e.g.** GEESE, 1990; **STIEHLER** et al. **1988),** because the distance of the tests were much longer in comparison to the distances running with highest speed in the sport-games. Additionally the direction of motion were only straight on and the reaction times were not measured. The aim of this study was to evaluate tests for speed diagnostics, which consider the specific demands of the sport games soccer, handball and tennis.

## METHODS:

In a cross-section design 4 soccer-teams, 4 handball-teams **(CEZANNE,** 1992) and 2-10 tennisplayers of different levels of performance participated in this study. The lenghts of the run and the **kind** of changes of direction depends on the conditions of the sport-games. Fig.1 gives an overview of the running pathway exemplary for the **tennis-test.**
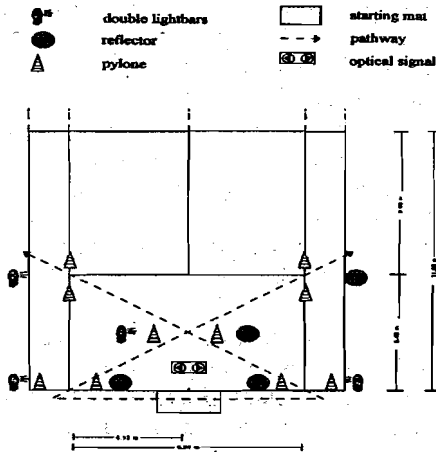


Fig. 1 Overview of the running pathway exemplary for the tennis-test. This equipment was transfered to the conditions of soccer and handball. Changes were made in distance and in degree of rotation.

For the time recording we used a measuring system of 4 double lightbars. Each run starts from a defined position on a contact platform. All signals from the start to the last lightbar were given up to an electronical unit close to a notebook with a special parallel port measuring software (FICHTE et al., 1993). The starts were free selected and/or given by an optical signal. The following abilities were recorded differently in separate tests:

A :      the ability to start and accelerate straight on.
B:      the ability to start, deccelerate and accelerate in connection with changes in
       direction of motion.
C:      the ability to react in connection with selection and following game specific
       movements.

The statistical computation is based on the goodness of tests. The reliability of the evaluated tests were calculated by test-retest correlation coefficient. To check the selectivity of the tests analyses of variance were used to calculate significant differences. Factor analyses were computed to examine dimensions of speed.

RESULTS:
The presentation of our results is based on the main criterions of goodness of test namely reliability, objectivity and validity. This criterions are computed separately for the three sport games.
The reliability of the evaluated tests are in the range of $rtt = ,72 - .98$ and therefore acceptable.
The selectivity of the tests is generally sufficient (exception: test A for tennisplayers). The linear speed-test for tennis players examines not a tennis specific ability. Factor analyses based on the correlation matrix of the tennis players showed three dimensions of speedness measured with our equipment. Overlapping factor values resulting from variables who indicate the last 10m-time of test B (sprinting 5m to the left/right, decelerate, rotation to the right/left, accelerate 10m straight on ) with the factor that represents linear sprint, make clear, that this dimension of sprinting straight on is measured in Test B. As a result of the factor analyses of the measuring consumption only two sprint test are necessary (BOS et al. 1994).
The great differences of the intraindividual type among runners with turns to the left and right, as well as between the teamplayers illustrate the necessity of precise diagnostics (see Fig. 2).
In a longitudinal study we checked the transfer of the diagnostic results into the training process. We applicated to middle class soccer-players some special training tasks to eliminate individual weakness. Fig. 2 showed the results of the PRE-DIAGNOSTIC and the intraindividual changes after 6 weeks of additionally exercised training.
The results of the longitudinal study enhance the assumption that a few number of training units will eliminate individual deficits (FRICK et al. 1993). Therefore the players show higher variability in turning to both sides.
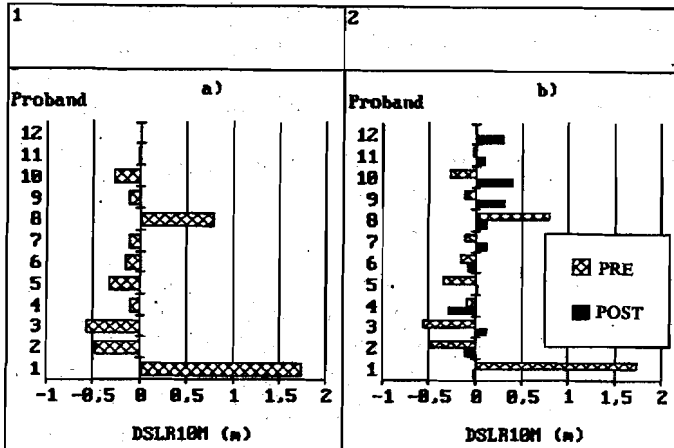
Fig. 2 : Figure on the left side (a) illustrates the intraindividual differences(m) measured in the PRETEST between the sprint lo the left and to the right. Figure on the right side(b) showed additionally the results of the POST-TEST.

**Fig. 2** : **Figure on the left side (a) illustrates the intraindividual differences (m) measured in the** PRE-TEST **between the sprint to the left and to the right. Figure on the right side (b) showed additionally the results of the** POST-TEST.

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