PERIODS OF ACCELERATED IMPROVEMENT OF MOTOR ABILITIES

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INTRODUCTION

Periodical alterations in the rate of improvement of motor abilities has been shown (for review see Beunen 1988, Malina 1991). With the view of generalizing the concerned data a great body of results obtained in Australia, Belgium, Byelorussia, Canada, Czechoslovakia, Estonia, Finland, Germany, Italy, Lithuania, the Netherlands, Russia, Turkey, Ukraine and USA were analyzed. The main point of interest was the ages of accelerated improvement of various motor abilities.

METHODS

In each set of data the ages of increased annual rate of development of various motor abilities were detected. In order to sum up the results of various studies an consensus index (CI) was used. The CI expresses the percent of studies which indicate the increased rate of improvement of motor abilities at a certain age. In computing the CI cross-sectional studies on several hundreds or thousands persons, or longitudinal studies on more than 65 persons were considered. Results of tests of combined usage of various abilities were excluded.

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| GENERAL MOTOR SKILL (MOVEMENT COORDINATION)

SPEED

EXPLOSIVE STRENGTH

STRENGTH

AEROBIC ENDURANCE

TRUNK FORWARD FLEXION

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fig. 1: Age periods of accelerated improvement of motor abilities in boys (solid lines) and girls (interrupted lines) according the highest values of CI (see the text).
RESULTS
In children/adolescents of both gender there are two age-periods of increased rate of speed and explosive strength (in boys of 7 to 8 and again at the age of 13 to 16, in girls between ages 6 to 9 and 10 to 13). In improvement of strength the peak failed to appear in preadolescents. In male and female adolescents the peak in the rate of strength improvement was shifted by a year to higher ages, when compared with the second peaks in improvement of explosive strength. In improvement of movement coordination and general motor skill only one peak of improvement rate was persuasive: from 7 to 9 in both gender. A certain plausibility for accelerated improvement of aerobic endurance was suggested by values of CI from 8 to 9 boys and from 9 to 10 in girls. More plausible is the secondary increase in the rate of endurance improvement at 10 to 13 years of age. Trunk forward flexion seems to improve considerably between the ages of 12 and 16 with peak rates from 12 to 13 in gills and from 15 to 16 in boys.

DISCUSSION
In male population the ages from 7 to 10 and from 13 to 16 years are decisive for motor development. In female population the first period of accelerated motor development reveals at the same age as in males, but the second period appear 2-3 years earlier. Obviously, during the childhood and adolescence several critical events take place possessing essential significance for motor development. In the time period from 7 to 18 years, the most critical ages for those events are from 7 to 9 years, and the circumpubertal age. According to the theory of critical/sensitive periods in ontogenetic development (fillingworth 1964, Bronstein 1989) the related critical events trigger accelerated rate of improvement of motor abilities. When the opportunities provided by critical events are utilized, the improvement rate decreases.

REFERENCES

