

**PHYSICAL FITNESS AND SOMATIC  
CHARACTERISTICS OF PRIMARY SCHOOL  
CHILDREN REFLECTED IN TWO DECADES**

**Ingrid Ružbarská**

**RAM-Verlag  
2021**

# **PHYSICAL FITNESS AND SOMATIC CHARACTERISTICS OF PRIMARY SCHOOL CHILDREN REFLECTED IN TWO DECADES**

© Author:  
Ingrid Ružbarská

Reviewers:  
Prof. Dr. Monika Piątkowska, PhD.  
Assoc. Prof. Mgr. Dana Masaryková, PhD.

Translation: Mgr. Marta Kopčíková, PhD.

Publisher: RAM-Verlag, Lüdenscheid, Germany  
1st Edition

© Copyright 2021 by RAM-Verlag, D-585115 Lüdenscheid

Publisher:

RAM-Verlag

Stüttinghauser Ringstr. 44

D-58515 Lüdenscheid

Germany

RAM-Verlag@t-online.de

<http://ram-verlag.eu>

The publisher cannot be held responsible for any linguistic errors in book:

Such responsibility is only up to the authors

**ISBN 978-3-96595-004-7**

---

This book is an output of VEGA grant project 1/0122/19 *Somatic and motor characteristics of children of younger school age and their development trends with a special focus on children from marginalized Romany communities*, principal investigator: Assoc. Prof. Ingrid Ružbarská, PhD.

# Contents

<b>Preface</b>	
<b>Introduction</b> .....	<b>1</b>
<b>1 Motor abilities: a structural component of human motor skills</b> .....	<b>3</b>
<b>1.1 Theoretical definition of motor abilities</b> .....	<b>3</b>
<b>1.2 Structural models of motor abilities</b> .....	<b>4</b>
<b>1.3 Motor abilities in the concept of motor performance and physical fitness</b> .....	<b>7</b>
<i>1.3.1 Motor performance and physical fitness</i> .....	7
<i>1.3.2 The concept of health-related fitness</i> .....	8
<b>2 Motor attributes of younger school-age children</b> .....	<b>9</b>
<b>2.1 Defining the concept of motor development</b> .....	<b>9</b>
<b>2.2 Motor skills in a younger school age</b> .....	<b>11</b>
<b>2.3 Developmental trends of motor abilities in a younger school age</b> .....	<b>13</b>
<i>2.3.1 Strength abilities</i> .....	13
<i>2.3.2 Endurance abilities</i> .....	14
<i>2.3.3 Motor speed abilities</i> .....	15
<i>2.3.4 Flexibility</i> .....	17
<i>2.3.5 Coordinative abilities</i> .....	17
<b>2.4 Somatic development as a motor skills determinant of a younger school-age child</b> .....	<b>19</b>
<b>2.5 Motor skills in relation to the cognitive and emotional development and socialization of a younger school-age child</b> .....	<b>20</b>
<b>2.6 Motor development and physical activity of a pupil in primary education</b> .....	<b>22</b>
<b>3 Methodological and educational dimensions of motor abilities diagnostics in the school population</b> .....	<b>25</b>
<b>4 Children from a socially disadvantaged environment in primary education</b> .....	<b>30</b>
<b>4.1 Defining the concept of a socially disadvantaged environment</b> .....	<b>30</b>
<b>4.2 Children from marginalized Roma communities in primary education</b> .....	<b>32</b>
<b>5 A brief overview of current knowledge about secular trends in somatic and motor dispositions of the school population</b> .....	<b>36</b>
<b>5.1 Defining the concept of a secular trend</b> .....	<b>36</b>
<b>5.2 Secular trends in physical fitness of the school population in scientific discourse</b> .....	<b>37</b>
<b>5.3 An overview of current scientific knowledge about secular trends in physical fitness of the school population</b> .....	<b>38</b>
<b>6 Somatic development and physical fitness in the reflection of secular trends and socio-educational context of a younger school-age children</b> .....	<b>43</b>
<b>6.1 Theoretical definition of a research problem</b> .....	<b>43</b>
<b>6.2 Aim, tasks and hypotheses of the research</b> .....	<b>46</b>
<i>6.2.1 Aim</i> .....	46
<i>6.2.2 Hypotheses</i> .....	47
<i>6.2.3 Tasks</i> .....	47

<b>6.3 Methods</b> .....	<b>48</b>
6.3.1 <i>Organization of the research process</i> .....	48
6.3.2 <i>Characteristics of the research sample</i> .....	49
6.3.3 <i>Methods of collecting research data</i> .....	51
6.3.4 <i>Methods of research data analysis and interpretation</i> .....	54
<b>6.4 Research results and discussion</b> .....	<b>55</b>
6.4.1 <i>Somatic development and physical fitness of younger school-age children         from the socio-educational perspective</i> .....	55
6.4.2 <i>Secular trends of somatic and motor preconditions in younger school-age children</i> .....	67
6.4.3 <i>Physical fitness of younger school-age children in terms of their weight status</i> .....	83
<b>Conclusion</b> .....	<b>92</b>
<b>Summary</b> .....	<b>96</b>
References .....	99
Author index .....	118
Index .....	120
About the authors .....	122

## Preface

Diagnostics of human motor competence is currently still an open and dynamic system in which each piece of knowledge can contribute to the refinement and modernization of knowledge about motor development and competence of individuals in different population groups.

The concentration of the current scientific discourse on the study of the abilities and skills of the school population results from their association with the health of the individual. However, a number of formulated research problems are still open and many questions remain unanswered. There are no clearly defined (*a*) determinants of motor competence and (*b*) intervention possibilities; (*c*) secular trends in the international reference framework are marginally documented; (*d*) representative research data on motor differences of children in various educational, sociocultural or environmental contexts are missing; and (*e*) the transfer of scientific knowledge into educational policies, national curricula and educational practice appears to be problematic.

The research intention of the presented scientific monograph responds in a way to the scientific research demand for the expertise of educational practice in the development of motor abilities and skills of primary school children and for the establishment of modern educational strategies with regard to the diversity of their psychosocial and motor development.

The presented monograph was created with the support of the grant project VEGA of MESRS SR (Ministry of Education, Science, Research and Sport of the Slovak Republic) and SAS (Slovak Academy of Sciences) (No. 1/0122/19) entitled *Somatic and motor characteristics of children of younger school age and their development trends with a special focus on children from marginalized Romany communities*. Regarding its research context, the project provides an excursion into the issue of trends in somatic and motor parameters of primary school children within the past two decades. From the methodological viewpoint, the research is based on a comparison of the level of somatic development and motor abilities of today's generation of younger school-age children with the research works of Turek (1999) and Horváth (2001), in which the European testing system EUROFIT was applied. This comparative approach makes it possible to indicate generational trends in two parallel research lines. First, it provides an insight into the differences in somatic development and physical fitness of the standard school population, with research data from the late 1990s being the reference framework (Turek, 1999). The second line is represented by the research findings of Horváth (2001), which enable the identification of secular trends in somatic and motor characteristics of children from a s

## *Preface*

socially disadvantaged environment coming from marginalized Roma communities. The research aim of this monograph also partially touches on the examination of the mentioned parameters of younger school-age children from the perspective of their various socio-educational contexts (children with special educational needs or from a socially disadvantaged environment). This methodological paradigm can thus indirectly indicate the projection of socio-cultural, socio-economic and educational specifics into the level of motor development of younger school-age children. As part of the empirical intention, an analysis of the level of children's physical fitness in terms of their weight status manifested by the body mass index (BMI) is also carried out. This partial aim allows verifying the effect of overweight on the level of participants' motor abilities.

We believe that the research grasp of the theoretical basis in this monograph will contribute to updating the global scientific framework for the study of motor competence in the school population, but also to raise several questions for professional and scientific discussion.

At this point, we would like to express our gratitude to the reviewers whose professional suggestions and comments contributed to the improvement of this publication. Many thanks to all cooperating teachers at the participating primary schools for their helpfulness, willingness and collaboration in data collection. And last but not least, we thank the main participants of the research plan – children – for their active participation, joy and enthusiasm during testing.

## Introduction

The study of human motor abilities and skills represents permanently recurring cycles applying innovative methodological approaches associated with the search for more effective educational strategies in order to stimulate the motor potential of the individual.

The developmental trajectory of each child's motor competence is unique with individual internal and external factors, obstacles or opportunities. Significant interindividual variability of the children's motor skills in this developmental period reflects the diversity of neuromuscular maturation, motor development, socio-cultural or environmental context, educational opportunities for physical activity, as well as the quality of motor patterns provided.

Within the educational area *Health and Movement*, the concept of primary education in Slovakia is oriented to the formation of motor development, the creation of conditions for adaptive changes towards more effective motor control and the development of the children's motor competence. The aim is to get children physically fit and motor literate in diverse elementary and specialized physical activities. Physical activity should become a permanent part of their daily lives in a lifelong horizon.

At present, there is a global appeal towards increasing the quality of *Physical Education and Sports* as a key factor in the formation of lifelong motor competence and a positive trajectory of the child's lifestyle. Emphasis is also placed on the concept of physical literacy as a motivation and predisposition to use one's own motor potential to improve a person's quality of life.

The promotion and maintenance of adequate physical activity, health-related physical fitness and a healthy body weight of the school population is the subject of global professional and scientific efforts. However, there is still a lack of explanation regarding the interaction of individual variables related to health and how it is reflected in the positive or negative trajectory of lifelong physical activity.

Given the strategic role of physical fitness and motor skills in the "mechanism" of creating a healthy and active lifestyle, it is reasonable to examine how motor preconditions diverge over time not only from the perspective of individual developmental changes, but also in terms of intergenerational differences. However, the identification of secular trends in somatic and motor parameters reflecting changing socio-cultural, demographic and economic contexts raises several questions, ambiguous or divergent research findings. This perception is largely related to the variability of applied methodological approaches within research intentions, to the varying degrees of complexity in viewing the construct of physical fitness, to

high variability in the application of test batteries, to (non-)representativeness of research sample, but also to an insufficient support when sharing research data in the international reference framework. However, systematic monitoring of the motor preconditions in children and adolescents is one of the crucial tools with regards to the evaluation and design of educational interventions and programs aimed at maintaining and increasing the physical fitness of the school population.

The presented scientific monograph is structured into theoretical and empirical part. In the first chapter, attention is paid to the definition of basic concepts that represent the theoretical framework of research. The second chapter focuses on the description of motor skills attributes of younger school-age children. Motor development is analyzed in relation to somatic, emotional, and cognitive development and socialization of the individual. This part also includes the characteristics of developmental trends in motor abilities. The basic methodological and educational aspects of diagnosing motor abilities in the school population are analyzed in the third chapter. The fourth chapter presents an insight into the educational and socio-cultural context of children from a socially disadvantaged environment, especially from marginalized Roma communities. The last chapter of the theoretical part contains a brief, current overview of knowledge about the secular trends in somatic development and physical fitness of younger school-age children. The theoretical part thus creates a platform for scientific grasp of the formulated research problem, which saturates the empirical part of the monograph. In it, the focus is put on the identification of intergenerational differences in somatic development and physical fitness of primary school children with an indication of the differences in the parameters examined in children in terms of their different socio-cultural and educational contexts. Partially, the research problem also relates to the identification of the influence of weight status manifested by the level of body mass index (BMI) on the motor performance of children.