Pediatric Exercise Science: Back to the Future

Somehow, a quarter of a century has passed since the first issue of Pediatric Exercise Science went to print. This special issue celebrates these 25 years, the inspiration that led to the journal’s creation, the people who made it happen, the countless scientists who provided the substance, and, of course, the raison d’être of our field—the science of pediatric exercise.

In the journal’s very first issue, Tom Rowland, the journal’s founding editor, explained that the journal came about in response to a growing worldwide concern about diminishing physical activity and fitness levels in children. He wrote:

“Results of mass fitness testing have been interpreted as indicating that youngsters in many modern societies may be seriously out of shape. Is this really true? What are the implications for their future health? How do we reverse this trend?” (10)

Twenty-five years later, we are taking a second look at the questions that were raised back then. In a way, we are going back to the future. Ten articles were selected from the first volume, and leading scientists in the respective areas, mainly from among the original authors, were asked to submit a manuscript reflecting on the original publications. More specifically, authors were asked to comment on each respective topic and address the following questions:

• Where were we 25 years ago?
• How far have we advanced since then?
• What does the future hold in that area?

Notably, all accepted the challenge! The following pages provide insight, reflection, summary, and commentary on “age-old” topics such as children’s physical fitness, oxygen uptake, body composition, physical activity, and training in children. They also provide valuable notes on less visited topics such as children’s endocrine response to exercise, large-scale population studies, longitudinal growth-related studies, and exercise and disease (i.e., cystic fibrosis).

As could have been expected, not all the questions posed 25 years ago have been answered and many more have since arisen. A quick PubMed search using the keywords oxygen consumption or oxygen uptake, children, and exercise reveals more than 1,600 references over the last quarter of a century. However, even in this issue, our pediatric exercise experts cannot agree on whether we should use the term maximal or peak oxygen uptake or whether it really matters (1,11). While growth-related increase in absolute aerobic power (measured in L/min) is to be expected, it is not quite clear what the pattern of change is once values are dimensionally scaled (1,6). Indeed, the observed pattern of change may depend on the method of scaling (ratio, allometric), leaving us searching for the factors that best account for
the maturational changes in aerobic capacity. While oxygen uptake is probably the most frequently reported physical capacity measurement in children, Armstrong (1) highlights the importance of oxygen kinetics measurements and their ability to provide a noninvasive window into muscular metabolism. Indeed, Kemper et al. (6), in their discussion of longitudinal studies, recommend the incorporation of oxygen kinetics measurements in future studies.

While oxygen uptake can be a valuable measurement in a laboratory setting, Pate et al. (9) provide an enlightening account of the development of fitness testing in large-scale population studies, specifically in school settings, and how these have proven useful in monitoring public health and helping to formulate public health policy.

The value of physical activity for children’s healthy development is widely recognized, but how to assess, measure, quantify, and evaluate this physical activity is not quite standardized and established. Hay (5) provides an insightful reflection and a delightful commentary on the available methods for assessing children’s physical activity. What determines children’s motivation to participate in or withdraw from physical activity is the subject of Weiss’s (13) thorough analysis of the current research trends. Weiss also makes enchanting references to Back to the Future (for all those diehard fans of the movie and its sequels) and is credited with the title of this special issue.

Surprisingly, resistance training in youth is, I dare say, still a controversial issue. Its enhancement of children’s muscle strength and its potential health benefits have been repeatedly demonstrated scientifically; yet, other than by young athletes, it is not widely practiced. Faigenbaum et al. (4) make the argument that current physical activity guidelines for children focus on moderate-to-vigorous aerobic activity but should also include strength-promoting exercises. Moreover, the authors argue that muscle strength and resistance training may be essential in disease prevention and the reduction of health risks.

Childhood obesity has become an epidemic. Lohman et al. (7) comprehensively review the developments in pediatric body-composition assessment and how those developments have proven useful in understanding the secular trends in pediatric adiposity and health.

Exercise has demonstrated value in the diagnosis of some diseases (e.g., asthma) and the prevention and management of others. A great example is in the management of cystic fibrosis, in which exercise is used as an effective management tool (12) and physical fitness is associated with lower morbidity and mortality (8). Cerny (2) provides a concise account of the reasons for the current consensus that regular exercise should be part of the standard care of children with cystic fibrosis.

Finally, Eliakim and Nemet (3) accepted the challenge of didactically describing the staggering advances in the understanding of pediatric endocrine responses to exercise over the past 25 years. The authors emphasize the response of the growth hormone–IGF-1 axis and how that knowledge can be applied in elite youth sports. Still, while our understanding of this field has dramatically deepened in the past quarter century, I nevertheless feel confident saying that it remains in its infancy.

Importantly, each of the papers in this issue provides the reader with insight into where we will be heading in the near future. Therefore, considering the likelihood of future sequels, perhaps this issue should be titled Back to the Future Part I.
A Special Word of Thanks

In 1987, Rainer Martens of Human Kinetics had the foresight and understood the importance of a scientific journal devoted to children and exercise. On a cold morning in Urbino, Italy, in the midst of a conference on children and sports, Rainer presented the idea to Tom Rowland, who enthusiastically accepted the position of founding editor of Pediatric Exercise Science. In February of 1989, the first issue of PES was launched. Tom’s enthusiasm and Rainer’s unrelenting support have been the foundation and sustenance of our journal. For more than 23 years and with steadfast devotion, Tom skillfully and enthusiastically delivered, nursed, reared, and raised the journal of Pediatric Exercise Science. Over these 23 years, the journal had smoothly progressed from infancy to adulthood. Two years ago, I was very fortunate to have been asked to step into Tom’s oversized shoes and accept the challenge of the journal’s continued development. I would like to take this opportunity to express my wholehearted appreciation: Thank you to Rainer Martens for his inspiration and continued support of the journal. Special gratitude to Tom Rowland for his devotion, skill, and stamina in his role of founding editor, shepherding the scientific knowledge of pediatric exercise science onto these pages, and for his inspiring, often provocative, and always enlightening editorials and commentaries.

Thank you!

Bareket Falk
Editor

References