BOOK REVIEW: THE SCIENCE OF GYMNASTICS

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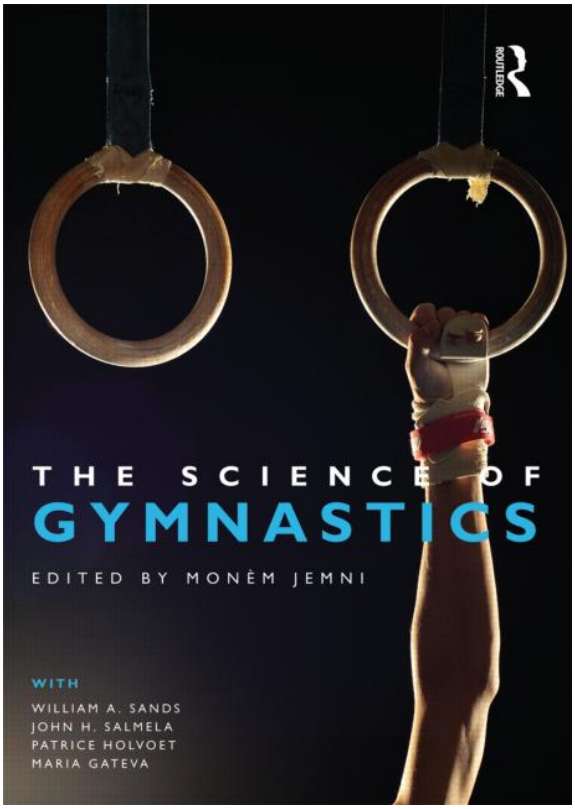
Book review

The book entitled "The Science of Gymnastics" written by Monèm Jemni, William Sands, John Salmela, Patrice Holvoet and Maria Gateva, provides a compilation of three fundamental principles and their interaction and relation for gymnastics, namely the physiological, the biomechanical and the psychological principle. Compared to existing textbooks, it is the first time that the reader finds the compilation and integration of these three different research areas which is necessary to know for successful coaching and developing gymnastics.

Divided into four parts, the content of the book is structured clearly. Each of the first three chapters explains in detail one of the mentioned principles above closing with summarizing questions. The authors combine these principles in the fourth part and show the interaction of the physiological, the biomechanical and the psychological view in order to enhance gymnastics performance. Based on their scientific view, the authors draw conclusions for future work in the research field of gymnastics. Additionally, based on both point of views, from the scientific and from the practitioners view, they show implications for practitioners and coaches for the different gymnastics apparatuses.



The physiological part (Part I) of the book addresses aerobic and anaerobic metabolism and their relation to the different gymnastics exercises. Afterwards, a fitness model for gymnastics is explained and training principles are shown in order to complete the physiological view of gymnastics. In addition to that, the authors show how physical and physiological

assessments of gymnasts can be monitored and tested besides nationally developed test batteries. The authors close with explanations of diet, nutrition and supplementation and their effects on the gymnast's body. In the last chapter of Part I, the reader gets an impression of how physical aspects are considered in rhythmic gymnastics.

The biomechanical part (Part II) of the book firstly deals with linear and angular kinematics and secondly with linear and angular kinetics in a detailed description and explanation. Physical units and their calculation are introduced as well as their application to gymnastics. The authors show many examples (vaults, dismounts, floor exercises, etc.) which help to understand mechanical principles (calculation of forces, movement analyses, Newton's laws, etc.) and their implications for a specific gymnast or a specific movement.

The psychological part (Part III) of the book explains the development from a novice to an expert gymnast and addresses implications of coaching and of parenting for learning and performing in gymnastics. Afterwards, the Ottawa Mental Skills Assessment Tool with its 12 scales is described. Especially, the comprehensible implications for learning and performing gymnastics should be highlighted. Just as one example, it is shown how fear control or relaxation can influence the performance, which is important for all gymnasts during training and competition.

The fourth part (Part IV) of the book shows the three mentioned scientific views on gymnastics, how they interact and how the three views can explain for example the performance of a gymnast. This should be highlighted because it helps coaches, gymnasts and scientists to generate a complete base for developing gymnastics. Although it is probable not the main aim of the authors, it is absolutely conceivable that the collected and illuminative material is transferable to other kind of sports such as speed skating, figure skating or other related sport. Furthermore, the chapters of each section and especially of the integrative fourth part provides a knowledge foundation which is worth to think about own training methods or to pursue own research.

Overall, the book written by leading international sport scientists is a *must-have* for coaches, gymnasts as well as for scientists because it provides not only useful and fundamental links between theory and the applied field, but also a transfer to enhance performance. All persons engaged in the field of (artistic or rhythmic) gymnastics should recognize this up-to-date work.

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