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Motor learning and control is a matter of communication between the central nervous system and the musculoskeletal system, i.e. that the brain sends out signals to the body in order to achieve coordinated movements and similar motor responses. Motor development is thus about both cognitive and physical development. Motor training is of paramount importance in the young child's development, particularly in cases where the motor development doesn't come as easy as in most cases. There are gross motor and fine motor skills, where the former deals with larger body movements and the latter of for example dexterity. In Sweden, research on motor skills is mainly concerned with the effects of determined motor training during the first years of school, showing not only improved motor skills as a result, but also significant positive effects in other school subjects, such as mathematics and Swedish. The leading Swedish researcher in this area is Ingegerd Ericsson, and it seemed natural to ask her to review the second edition by Cheryl A. Coker's *Motor Learning & Control for Practitioners* (Holcomb Hathaway). In an informed and critical review Dr. Ericsson points to certain problems in the book, but she insists on its value as a textbook in that it has a good pedagogical tone and a balanced presentation of theory, research, and practical implications.

Well developed textbok

Ingegerd Ericsson

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*Cheryl A. Coker***Motor Learning & Control for Practitioners**

304 pp, pb., ill.

Scottsdale, AZ: [Holcomb Hathaway](http://HolcombHathaway.com)

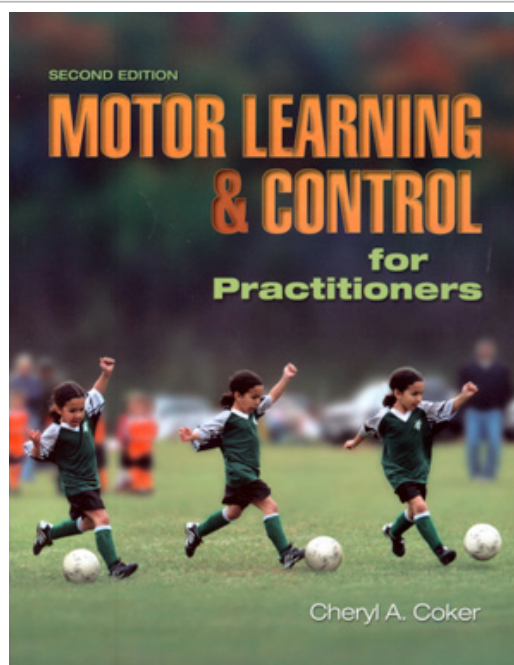
2009

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This second edition of Cheryl A. Coker's *Motor Learning & Control* reflects current research and theories in its field, such as Gentile's taxonomy and the constraints-led approach. It provides a good balance between conceptual and practical examples. The introduction includes an interesting pre-test based on common myths and misconceptions regarding motor learning and control. When answering the questions in the test the reader's curiosity arises.

Cerebral Challenges, Research notes and Marginal Features aid the reader's understanding of the theoretical concepts. At the end of each chapter there is a summary with focus points and review questions which makes the structure relevant and pedagogical. In addition there are plenty of useful web links to direct the interested reader to several other information sources.

The content is comprehensive and includes detailed descriptions of the key concepts motor learning, motor control, and motor skills (fine, gross, manipulative, discrete, serial, and continuous). Motor learning is defined as "a relatively permanent change in a person's capability to execute a motor skill, as a result of practice or experience" (p. 121). Open and closed environmental factors are discussed. Regulatory conditions and action requirements are described as tools to differentiate motor skills in a multidimensional classification system. In categorizing motor



abilities, Fleishman's taxonomy is presented to identify underlying perceptual and physical skills that are predictive of high skill proficiency levels.

In theoretical approaches to perception and movement preparation two models are described and discussed in detail:

1. The information processing model, where sensory information is compared to similar past experiences before a response is selected.
2. The ecological approach, in which a direct relationship between perception and action is suggested.

The two prominent theories, *the motor program theory* and *the dynamic system theory*, offer explanations of how movement is coordinated and controlled. Evidence supporting both the motor program control theory and the dynamic interaction theories are presented and thoroughly penetrated.

Motor control in the motor program theory is thought to be a function of open- and closed-loop mechanisms, where movements are planned in advance.

Accumulated experiences and information are translated into relationships that will be used to guide future attempts. As skill proficiency increases, there is a shift to more automatic open-loop processes characteristic of skilled performance. The schema theory in the generalized motor program theory proposes that movements are generalized and revised with each movement experience. The role of the instructor is to provide the learner with appropriate activities to strengthen the schema.

” Surprisingly though, the other areas such as the vestibular system, auditive and tactile perception, which also may have an impact on movement acquisition, do not get the same attention and are just briefly mentioned.

The dynamic system theory on the other hand argues that movement emerges/self-organizes as a function of the constraints (organismic, environmental, and task) imposed on the system. According to the constraints-led approach the learner searches through a range of potential movement solutions for the optimal movement strategy. The role of the practitioner is to identify and manipulate key constraints to guide the learner's search for optimal movement solutions.

The chapter on the nervous system includes a description of sensory receptors and the two important areas: Vision and proprioception, which are examined in detail. Surprisingly though, the other areas such as the vestibular system, auditive and tactile perception, which also may have an impact on movement acquisition, do not get the same attention and are just briefly mentioned.

One of the most important conclusions for teachers and practitioners is that children should be provided with as many varied movement experiences as possible. Practical implications are that the tasks should be developmentally appropriate, i.e. since children achieve gross motor skill proficiency before they develop control over fine motor skills, tasks should be introduced in a sequence moving from gross to fine. These conclusions and pieces of advice are very much in line with other theories formulated by e.g. Ayres, Holle and Hannaford used in the Swedish MUGI model of motor skills training (Ericsson, 2007; 2008a; 2008b).

The book has several advantages, such as the previously mentioned pedagogical features cerebral challenges and frequently used explorative activities, i.e. experimental mini-labs for students to perform, discuss and reflect upon. The reader, however, might wish for solutions and various alternatives to be more specifically discussed in the text.

There are no illustrations in colour, which would have made photographs and figures even more tasty and appealing. Another thing I myself as a reader would have appreciated very much is a presentation of the author and her background.

Additionally, in a book about motor skills learning one would have expected a chapter about early fundamental motor development and learning. After all, as so very well put by Pica (2008): "We have to lay the foundation before we can construct the ground floor. We have to complete the ground floor before we can erect the rest of the building" (p. viii). Many children and young people are not yet developmentally ready to participate in organized sports and learn advanced motor skills. Some people even lack the ability to perform the most fundamental skills required in sports. There is, in my opinion, an absence of advice to practitioners and teachers in these situations.

Despite the disadvantages mentioned, such as lack of an author presentation, solutions to tasks and, fundamental motor skills training, the content of the book gives a good balance of theory, research and practical implications. It is pedagogically written and could be well recommended to PE students, teachers, and any practitioner involved in the field of motor learning and skilled movement acquisition and performance.

References


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